Tallapoosa

River Basin Management Plan

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Prepared for

Alabama Clean Water Partnership

Prepared by

CH2MHILL

In association with

East Alabama Regional Planning and Development Commission and Environmental Insight

March 2005

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The Alabama Clean Water Partnership

PO Box 3623
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August 2004

Prepared in partnership with

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Tallapoosa River Basin Management Plan

Submitted to

The Alabama Clean Water Partnership

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CH2MHILL

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This project was a collaborative effort with the East Alabama Regional Planning and Development Commission and Environmental Insight. The project also benefited from the participation of stakeholder committees in the Upper, Middle, and Lower Tallapoosa watersheds, as well as the Tallapoosa Steering Committee. Through this collaborative effort, a wealth of information was used to devise a stakeholder-driven basin management plan.

Listed below are the Tallapoosa Clean Water Partnership stakeholders that participated in the development of this basin plan:

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We hope that the Tallapoosa Clean Water Partnership stakeholders find this document useful in guiding watershed protection efforts so that future generations can enjoy this valuable resource.

Contents

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Exhibits

Acronyms and Abbreviations

A&I	agriculture and industry
ACES	Alabama Cooperative Extension System
ACT	Alabama-Coosa-Tallapoosa
ACWP	Alabama Clean Water Partnership
ADAPT	Alabama Drought Assessment and Planning Team
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
AEMA	Alabama Emergency Management Association
AFA	Alabama Fisheries Association
AFO	animal feeding operation
ALAMAP	Alabama Monitoring and Assessment Program
ALDOT	Alabama Department of Transportation
APCo	Alabama Power Company
ASCAA	Alabama's Special Camp for Children and Adults
ASMC	Alabama Surface Mining Commission
AUM	Auburn University–Montgomery
AWPCA	Alabama Water Pollution Control Act
AWW	Alabama Water Watch
AWWA	Alabama Water Watch Association
AWWB	Auburn Water Works Board
AWWTP	advanced wastewater treatment plant
B.A.I.T.	Bass Anglers Information Team
BASINS	Better Assessment Science Integrating Point and Nonpoint Sources
BFI	Browning-Ferris Industries
BMP	best management practice
BOD_5	5-day biochemical oxygen demand
^oC	degrees Celsius
CAFO	concentrated animal feeding operation
CBMPP	Construction Best Management Practices Plan
CBOD	carbonaceous biochemical oxygen demand
CDBG	Community Development Block Grant program
cfs	cubic feet per second
COE	U.S. Army Corps of Engineers
col	colonies
CWA	Clean Water Act
CWP	Clean Water Partnership
CWSRF	Clean Water State Revolving Fund
2,4-D	dichlorophenoxyacetic acid
D.A.R.E.	Drug Abuse Resistance Education

DBU	Declaration of Beneficial Use
DDD	dichlorodiphenyldichloroethane
DDT	dichlorodiphenyltrichloroethane
DIG	Drought Impact Group
DMR	discharge monitoring report
DO	dissolved oxygen
DOT	U.S. Department of Transportation
DWSRF	Drinking Water State Revolving Fund
EARPCD	East Alabama Regional Planning and Development Commission
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPD	Environmental Protection Division
EQIP	Environmental Quality Incentive Program
°F	degrees Fahrenheit
F&W	fish and wildlife
FEMA	Federal Emergency Management Association
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
GIS	geographic information system
gpd	gallons per day
gpm	gallons per minute
GSA	Geological Survey of Alabama
HUC	hydrologic unit code
HUD	U.S. Department of Housing and Urban Development
IBI	Index of Biotic Integrity
I/I	infiltration and inflow
ISTEA	Intermodel Surface Transportation Efficiency Act
LA	load allocation
LID	low-impact development
LMRA	Lake Martin Resource Association
LWF	limited warm water fishery
LWLM	Lake Watch of Lake Martin
LWV	League of Women Voters
M&I	municipal and industrial
µg/L	microgram per liter
mg/L	milligram per liter
mgd	million gallons per day
mL	milliliter
MOS	margin of safety
MS4	municipal separate storm sewer system
MW	megawatt
MWWSSB	Water Works and Sanitary Sewer Board of the City of Montgomery
NBOD	nitrogenous biochemical oxygen demand
NEMO	Nonpoint Source Education for Municipal Officials
NFWF	National Fish and Wildlife Foundation
NLCD	National Land Cover Data

NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source
NRCS	Natural Resource Conservation Service
OAW	Outstanding Alabama Water
OE	organic enrichment
OWR	Office of Water Resources
PCB	polychlorinated biphenyl
PLM	Professional Logger Manager
POTW	publicly owned treatment works
PWS	public water supply
QCI	Qualified Credential Inspector
QCIP	Qualified Credential Inspection Program
RFP	request for proposal
ROSE	Recycled Oil Saves Energy
RWQMP	Reservoir Water Quality Monitoring Project
S	swimming and other whole body water-contact sports
SDWA	Safe Drinking Water Act
SH	shellfish harvesting (coastal waters only)
SID	State Indirect Discharge
SRF	State Revolving Fund
SSO	sanitary sewer overflow
SWaMP	Saughahatchee Watershed Management Plan
SWCD	Soil and Water Conservation District
T&E	threatened or endangered
TDS	total dissolved solids
TEA	Transportation Equity Act
TMDL	total maximum daily load
TRRWW	Tri-River Region Water Watch
TSI	trophic status index
TSS	total suspended solids
TWP	Tallapoosa Watershed Project
UAA	use attainability analysis
UIC	underground injection control
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UST	underground storage tank
UTWC	Upper Tallapoosa Watershed Committee
WLA	waste load allocation
WPCF	water pollution control facility
WQC	water quality criteria
WQS	water quality standard
WWT	wastewater treatment
WWTP	wastewater treatment plant

Glossary Terms

303(d) List	Contains information about those waters that are not meeting water quality standards as determined by their current use classification.
305(b) Report	Contains known information about the state's waters.
Alluvial deposit	Soil or earth material that has been deposited by a stream or running water.
Animal feeding operation (AFO)	Agricultural operations where animals are kept and raised in confined situations. AFOs generally congregate animals, feed, manure, dead animals, and production operations on a small land area. Feed is brought to the animals.
Animal unit (AU)	A standard measure, based on feed requirements, used to combine various classes of livestock according to size, weight, age, and use. For federal lands, an animal unit represents one mature cow, bull, steer, heifer, horse, or mule, or five sheep or five goats, all more than 6 months old.
Antidegradation	An ADEM policy that stipulates that in water bodies where the quality exceeds the level necessary to support wildlife, recreation, fish, and other aquatic life, the existing quality will be protected and maintained. Antidegradation does not prohibit new pollution discharges.
Aquaculture	The science, art, and business of cultivating marine or freshwater food for commercial purposes.
Aquifer	An underground layer of porous rock, sand, or gravel containing large amounts of water.
Base flow	The volume of flow in a stream that is not derived from surface runoff.
Benthic	Organisms that live on the bottom of water (clams, crayfish, and a wide variety of worms).
Best management practice (BMP)	An activity designed or carried out for the purpose of minimizing water pollution.

Cataloging unit	A geographic area representing part of or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. These units subdivide the subregions and accounting units into smaller areas.
Chlorophyll *a*	The photosynthetic pigment found in most algae. Chlorophyll *a* is used to measure the rate of photosynthesis in a body of water.
Concentrated animal feeding operation (CAFO)	AFOs that meet the regulatory definition of a concentrated animal feeding operation and have the potential of being regulated under the NPDES permitting program. A CAFO is an AFO which: has more than 1,000 animal units (AUs); or has 301 to 1,000 AUs and wastes are discharged through man-made conveyance or directly into U.S. waters; or is designated a CAFO by the permitting authority on a case-by-case basis.
Conductivity	A measure of the ability of a solution to carry an electrical current.
Critical habitat	The area of land, water, and airspace required for survival and recovery of threatened or endangered plant or animal species.
Critical area	Any area that is prone to excessive erosion such as caving gullies, "galled out" areas that do not have sufficient vegetation, or sand and gravel pits.
Designated use/use classification	The use that the water body should attain as determined by ADEM and approved by EPA. Use classifications are assigned to each water body. Some water bodies can have multiple classifications, and classifications can vary from one segment of a water body to another.
Ecoregion	A homogeneous area defined by a similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables. Regions of ecological similarity help define the potential designated use classifications of specific water bodies.
Ecosystem	An ecological community of animals, plants, and bacteria together with its physical and chemical environment, considered as a unit.
Epilimnion	The upper layer of water in a thermally stratified lake or reservoir. This layer consists of the warmest water and has a fairly uniform (constant) temperature. The layer is readily mixed by wind action.

Eutrophic	A situation in which the increased availability of nutrients such as nitrate and phosphate stimulates the growth of plants such that the oxygen content is depleted and carbon sequestered.
Fall Line	The physiographic border between the piedmont and coastal plain regions. The name derives from the river rapids and falls that occur as the water flows from hard rocks of the higher piedmont onto the softer rocks of the coastal plain.
Geomorphology	That branch of physical geography dealing with the form of the earth, the general configuration of its surface, the distribution of the land, water, etc.
Groundwater	Water stored underground in rock crevices and in the pores of geologic materials that make up the earth's crust.
Groundwater withdrawals	Ground sources such as aquifers for agricultural irrigation and for a variety of urban purposes–residents, commercial areas, power production, and other industry.
Gully	A channel or hollow worn in the earth by a current of water; a short deep portion of a torrent's bed when dry.
Hydrologic unit code (HUC)	A geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the USGS.
Hypolimnion	The lowest layer in a thermally stratified lake or reservoir. This layer consists of colder, denser water and has a constant temperature where no mixing occurs.
Igneous crystalline rock	A rock formed by the solidification of molten materials (magma).
Impervious surface	Hard surface such as road or rooftop that prevents rainfall from soaking into the ground.
Land cover	Data mapped using general land cover classes. For example, forest is classified as deciduous, evergreen, or mixed.
Land use	How a certain area of land is used, such as for cropland, woodland, pastureland, etc.
Legacy, Inc.	A statewide organization that provides grants from the sale of environmental license plates to support programs that aim to help educate people to become environmentally responsible citizens.

Limited home rule	Gives restricted autonomy to a local governments. In Alabama, the legislature has the authority to grant powers to local governments. These are powers that local governments do not have under existing state law. The degree and levels of home rule may vary. Some powers, such as the power to tax or raise revenue, may be excluded from the powers granted. Because there are exclusions and the power given is not absolute, the home rule is considered limited.
Mesotrophic	Reservoirs and lakes that contain moderate quantities of nutrients and are moderately productive in terms of aquatic animal and plant life.
Metamorphic rock	A sedimentary or igneous rock that has been changed by pressure or chemical action.
Not supporting	For any one pollutant or stressor, the allowable pollution limits are exceeded in more than 25 percent of the measurements.
Nutrient criteria	ADEM-established, waterbody-specific criteria to enhance nutrient management. Nutrient criteria in the Tallapoosa Basin are expressed using chlorophyll *a*.
Oligotrophic	Pertaining to a lake or other body of water characterized by extremely low nutrient concentrations such as nitrogen and phosphorus and resulting in moderate productivity.
Partially supporting	For any one pollutant or stressor, the permitted pollution limits criteria are exceeded in 11 to 25 percent of the measurements.
Physiographic	Broad land groupings based on the physical features of the landscape.
Reference station	A single station with unimpaired water bodies characteristic (chemical, physical, or biological quality or condition) of an ecoregion and/or habitat. It is used as a standard for the comparison of simultaneous observations at one or more subordinate stations.
Riparian	Pertaining to the banks of a river, stream, waterway, or other, typically flowing body of water, as well as to plant and animal communities along such bodies of water.
Seep	An area of minor groundwater outflow onto the land or into a stream or other waterbody. Flows are too small to be a spring.

Stakeholder	Individual or organization with an interest in a particular area, issue, or project. Stakeholders may include public agencies at all levels (federal, state, and local), non-profit organizations, private landowners, industry, and citizens.
Storm Water Phase I	Relies on National Pollutant Discharge Elimination System (NPDES) permit coverage to address storm water runoff from: 1) "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater; 2) construction activity disturbing 5 acres of land or greater; and 3) 10 categories of industrial activity.
Storm Water Phase II	Requires additional operators of MS4s in urbanized areas with a 50,000 or greater population and operators of small construction sites of 1 acre or greater, through the use of NPDES permits, to implement programs and practices to control polluted storm water runoff.
Subbasin	A portion of a subregion or basin drained by a single stream or group of minor streams.
Subwatershed	A smaller geographic section of a larger watershed unit with a drainage area between 2 to 15 square miles and whose boundaries include all the land area draining to a point where two second-order streams combine to form a third-order stream.
Surface water withdrawal	The amount of water withdrawn from surface sources such as rivers or reservoirs for agricultural irrigation, drinking water supply, power production, industry, and other uses.
Thermocline	A vertical negative temperature gradient in some layer of a body of water that is appreciably greater than the gradients above and below it. In the ocean, this may be seasonal, due to the heating of the surface water in the summer, or permanent.
Transpiration	The movement of water from the soil or groundwater via plants to the atmosphere.
Trophic State Index (TSI)	A measure of the eutrophication of a body of water using a combination of measures of water transparency (turbidity), chlorophyll *a* concentrations, and total phosphorus levels. TSI measures range from a scale of 20 to 80.
Unconsolidated aquifer	Natural earth formation that has not been turned to stone, such as alluvium, soil, gravel, clay, sand, and overburden.

Unconsolidated sedimentary	Sediment not cemented together; may consist of sand, silt, clay, and organic material.
Urban development	Areas of the earth that have been improved by man. Includes all "built-up" and urban areas of the landscape. It ***does not*** include mining lands, crop lands, or waste-disposal areas (dumps). This land use category takes precedence over a land cover category when the criteria for more than one category are met.
Water quality criteria	Provide a description of what levels of individual pollutants or characteristics need to exist to meet a water body's assigned use classification. They can be expressed numerically as concentrations of pollutants, or they can be expressed in narrative terms.
Watershed	The land area draining into a body of water.
Wetland	Transitional lands between aquatic and terrestrial systems where the water table is at or near the surface of the land. This area is covered by shallow water. To be classified as a wetland, an area must have one or more of the following three attributes: 1) the land supports plants, which are adapted to wet soil conditions. These plants also are known as hydrophytes; 2) the base land is predominantly undrained hydric soil; 3) the base is non-soil and is saturated with water or covered by shallow water at some time during the growing season of every year.

Executive Summary

The Tallapoosa River Basin contains some of the highest quality water in Alabama. This river contains reservoirs that bring millions of tourist dollars to the state in addition to providing quality drinking water. Protecting this water resource is essential. Although the Tallapoosa River is known for its clean water, there are streams in this river basin that are impaired and in need of restoration. Furthermore, growth is occurring in certain portions of the watershed, particularly around the cities of Montgomery and Auburn-Opelika, the western fringes of the Atlanta metropolitan area in Cleburne and Randolph counties, and Elmore County. Although numerous benefits are associated with gains in economic development, there also are accompanying pressures on the Tallapoosa River's water resources. This plan describes the current water quality in the Tallapoosa River Basin and outlines strategies to restore and protect the water resources.

Basin management planning is a holistic approach used to manage, protect, and restore aquatic resources. The U.S. Environmental Protection Agency (EPA) defines this approach as "a coordinated framework for environmental management that focuses public and private efforts on the highest priority problems within hydrologically-defined geographic areas taking into consideration both ground and surface water flow" (EPA, 2004, www.epa.gov/OCEPAterms/wterms.html).

This basin management plan is being coordinated through the Alabama Clean Water Partnership (ACWP) with a Section 319 (h) grant from the Alabama Department of Environmental Management (ADEM) and EPA. The ACWP is a statewide nonprofit organization that serves to encourage watershed education, restoration, and protection by bringing together diverse stakeholders within a watershed to discuss water quality issues and to implement consensus-based, voluntary watershed management strategies. In addition to the statewide Clean Water Partnership (CWP) organization, the stakeholders who live, work, and recreate in the Tallapoosa Basin have played an integral part in the development of this plan.

The Process

A three-step process, involving a great deal of stakeholder input, was used to develop the watershed basin management plan for the Tallapoosa River:

- **Assess current conditions**–Existing data were reviewed to evaluate the watersheds in the Tallapoosa River Basin.
- **Evaluate management options and strategies**–Various management strategies to protect and restore the Tallapoosa River Basin were evaluated during this phase of the plan by stakeholders in the Tallapoosa CWP.
- **Prepare the plan and adopt the strategies**–This document contains water quality and biological concerns, suggested management strategies, and potential funding opportunities. Together, these components make up the basin management plan.

The Tallapoosa River Basin CWP is 1 of 10 basin organizations under the ACWP, which is the statewide umbrella organization. Each of the 10 basins, including the Tallapoosa, has a facilitator who works to coordinate stakeholders in their efforts to protect and restore water quality within their respective basins. The organizational structure of the Tallapoosa CWP has varied and changed over time. Participation in ACWP is voluntary, and most of the management strategies recommended in this plan are designed to be implemented on a voluntary basis. The exceptions are management strategies in urban areas that are related to regulatory policies such as storm water permits. Each participating partner has the ability either to influence or to control these strategies. Although the river section stakeholder groups (Upper, Middle, and Lower Tallapoosa) are linked through the Tallapoosa CWP Steering Committee, each meets and functions independently. Some of the river section committees have developed subcommittees to address specific issues and tasks. The Upper Tallapoosa CWP is an independent non-profit organization, which is formally called the "Upper Tallapoosa Watershed Committee." This group has subcommittees that meet on an as-needed basis. The primary stakeholder committee meets every third Thursday of the month in Wedowee, except during November and December (there is one meeting in November because of the holiday season). The Middle Tallapoosa CWP is chaired by the City of Alexander City. The Stakeholder Committee meets quarterly in Alexander City and has standing Education/Outreach and Technical Subcommittees, in addition to ad-hoc committees that are formed on an as-needed basis. The Lower Tallapoosa CWP is sponsored by the Water Works and Sanitary Sewer Board of the City of Montgomery (MWWSSB). This group meets on a quarterly basis, and the meeting locations rotate. Although the Lower Tallapoosa CWP has had both Technical and Education/Outreach subcommittees in the past, these committees currently are dormant. They will be reactivated as the need arises.

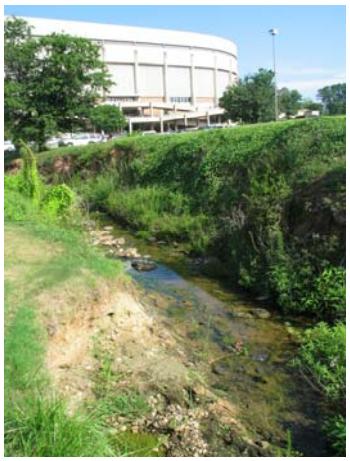
Background on the Plan

Good water quality is important to people in the Tallapoosa River Basin. Undeveloped watersheds generally have high quality water. As watersheds are developed, water quality begins to decline. Exhibit ES-1 illustrates streams in the Tallapoosa Basin in an undisturbed watershed and in a more developed watershed.

As the population in the Tallapoosa Basin grows, there will be increasing pressures on the health and stability of the Tallapoosa watersheds. The Tallapoosa CWP Steering committee recognizes this fact, and supports the development of a basin management plan that will identify management strategies that will protect our valuable resources.

EXHIBIT ES-1
Comparison of Streams in Undeveloped and Developed Watersheds
Tallapoosa River Basin Management Plan

Channahahatchee Creek at Gold Mine Road

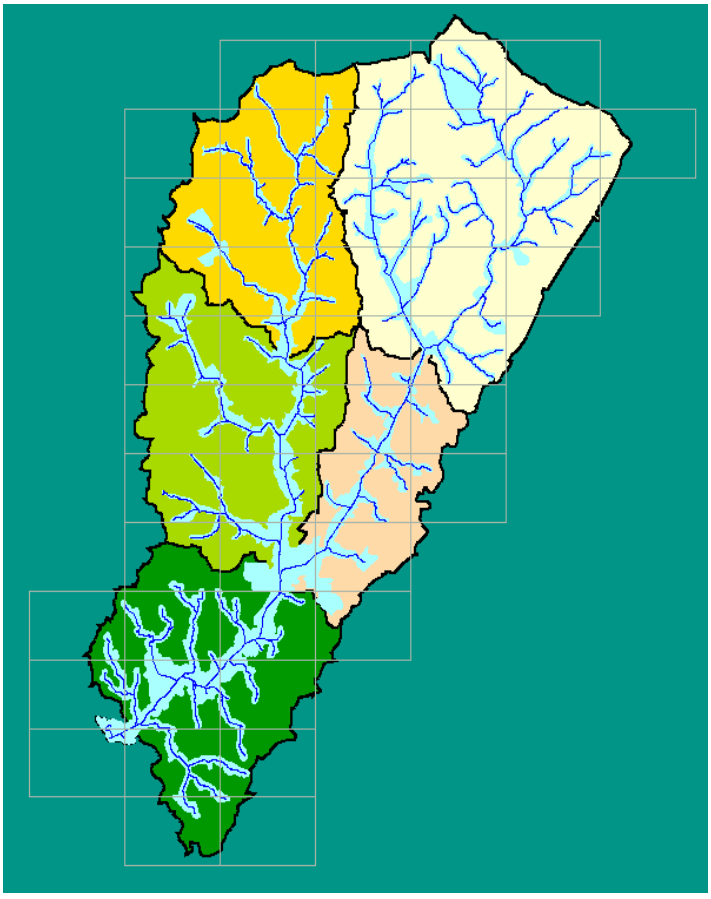


Parkerson Mill Creek at Auburn University

What is a Watershed?

A watershed is the region or land area that drains to a body of water. A watershed can be very small or encompass a major river basin. Larger watersheds can be divided into smaller ones (Exhibit ES-2). Every activity that happens within a watershed has an effect on water quality. Everyone lives and works within a watershed, and therefore, affects water quality.

EXHIBIT ES-2
Example Watershed
Tallapoosa River Basin Management Plan



Why is it Important to Protect Our Watersheds?

It is important to protect the Tallapoosa water resources because we depend on water for our daily needs. To protect our water resources, we must protect our watersheds. Watersheds provide the community with many functions, including the following:

- **Water supply**–The majority of people in the Tallapoosa Basin obtain their drinking water from surface water. Protecting the water quality and future water supplies protects human health.

- **Drainage**–Watersheds move water throughout the basin. Properly maintained watersheds are better able to move water during storms, thus minimizing flood damage to property.
- **Recreation**–Watersheds provide recreation sites for the stakeholders in the basin. Water-related activities such as swimming, boating, and fishing are provided.
- **Habitat**–Healthy watersheds provide both aquatic and terrestrial habitat for wildlife, including threatened and endangered (T&E) species.
- **Economic Benefits**–The four reservoirs on the Tallapoosa River add significant economic value by providing lake front property and a viable tourism industry.

The healthier the Tallapoosa Basin watershed is, the better it will be able to provide these functions to the people who reside in the Tallapoosa River Basin.

How do we Affect our Watersheds?

Because a watershed includes the land that drains to a water body, the activities on the land affect water quality. Both rural and urban areas can contribute to nonpoint source pollution. In urban areas, additional roads, parking lots, and buildings are developed to accommodate growth, and there is more impervious (incapable of being penetrated by water; non-porous) area created. With increased imperviousness, the following effects occur:

- Less rainfall can infiltrate the soils, which means that fewer pollutants are absorbed and filtered by the soil. These pollutants then run directly into streams, which negatively affects water quality.
- Less rainfall infiltrating the soils translates to less water flowing into groundwater and subsequently back into surface waters. Therefore, during periods of minimal rain, the groundwater table is lower and the flow within streams is lower. This situation can threaten the amount of water available from the surface water supplies and wells during dry years.
- A greater portion of storm water runs across the land and directly into the streams. This runoff creates higher storm flows within the streams, which results in increased flooding and damaged property, and can threaten or even claim lives.
- Higher storm flows within streams cause higher in-stream erosion, which increases stream sediment loads, impairs aquatic habitat, and results in reduced aquatic biodiversity.
- Thermal pollution is caused by the increasing or decreasing water temperature above or below normal seasonal ranges as a result of discharge of hot or cold effluent. In addition, if trees are cleared along stream banks, stream temperatures may increase due to lack of shading.
- Increasing concentrations of pollutants such as pathogens, nutrients, oil and grease, debris, pesticides, and other contaminants enter streams and rivers without being treated.

In rural areas, dirt roads and road banks, farmland, and silviculture can contribute to the following:

- Soil erosion can occur on farmland and stream banks trampled by livestock.
- Greater nutrient loads adjacent to water bodies may be caused by improper fertilization of cropland and poor animal waste management.
- The removal of trees from the stream bank buffer zone can play a role in increased water temperatures.
- Tree harvesting can cause diminished wildlife habitat and soil erosion if proper BMPs are not used.
- Improper application of herbicides and pesticides can run off from cropland into local streams.
- Pathogen contamination can be traced to improperly maintained septic tank systems or manure from cropland, barnyards, or livestock.

Exhibit ES-3 illustrates these changes in hydrology.

Data collected throughout the United States indicate that without proper development practices and storm water controls, as imperviousness approaches 10 percent in our watersheds, water quality begins to degrade.

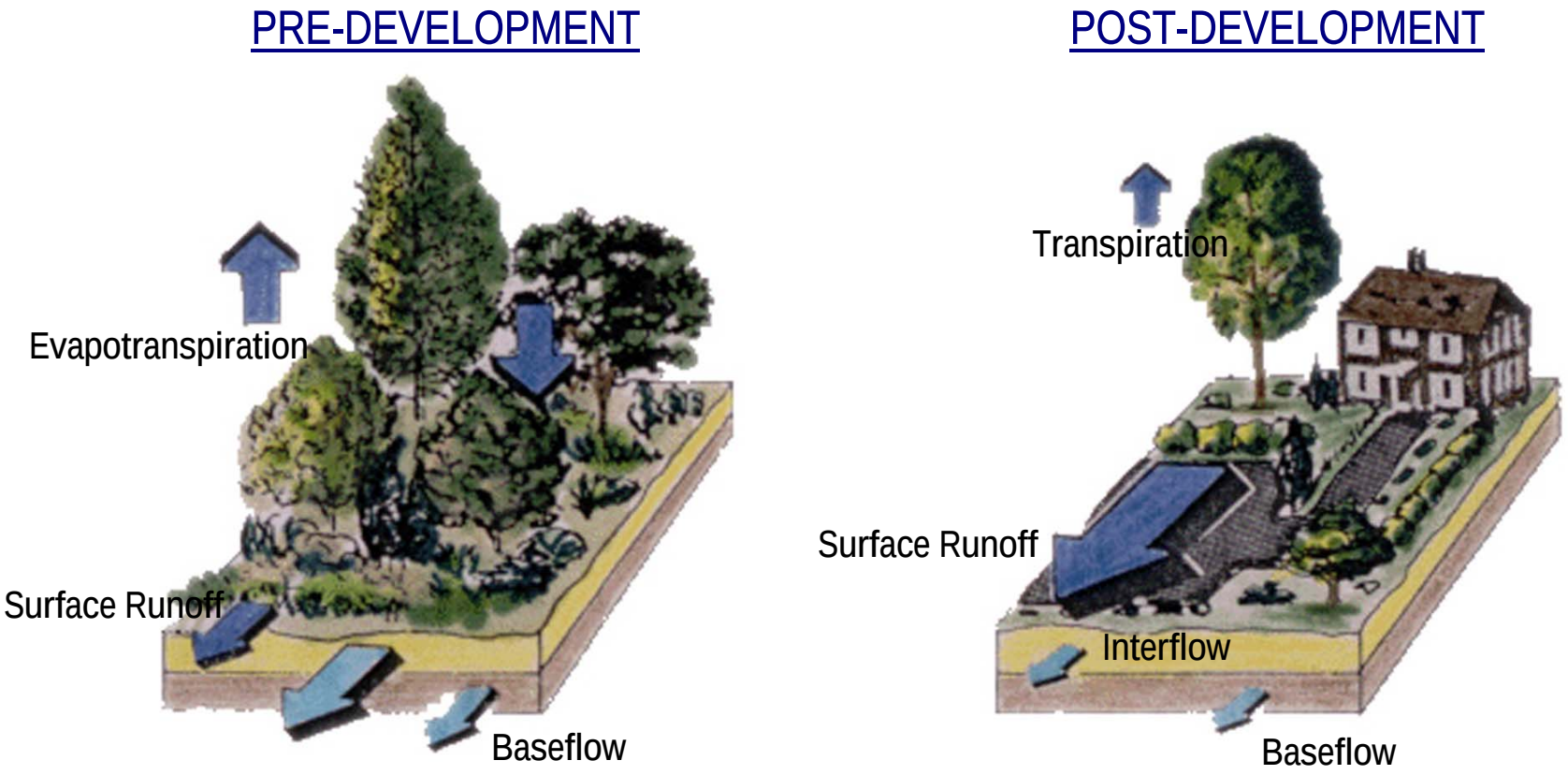
What are the General Characteristics of the Tallapoosa River Basin?

The Tallapoosa River Basin comprises the 4,675-square-mile watershed of the Tallapoosa River. Approximately 15 percent (650 square miles) of the Basin's drainage area lies in Georgia, where the river's headwaters originate. The headwaters of the Tallapoosa and Little Tallapoosa rivers begin in the Georgia counties of Paulding and Carrol, respectively, and enter Alabama in Randolph County southwest of the City of Atlanta to form the R. L. Harris Reservoir (commonly referred to as Lake Wedowee) and the main stem of the river. From the confluence of these two rivers, the Tallapoosa meanders southwesterly through four Alabama Power Company (APCo) hydrodams (R. L. Harris Dam, Martin Dam, Yates Dam, and Thurlow Dam) before joining the Coosa River to create the Alabama River. The Alabama portion of the Basin drains 4,025 square miles of land.

The river basin is divided into three major segments or "cataloging units" designated by the 8-digit hydrologic unit codes (HUC) 03150108 (Upper Tallapoosa), 03150108109 (Middle Tallapoosa), and 03150110 (Lower Tallapoosa). Exhibit 2-1 shows the counties and cities included in the Tallapoosa River Basin. The CWP has designated "river section" boundaries that differ somewhat from the hydrologic boundaries originally defined by the U.S. Geological Survey (USGS). The CWP Upper Tallapoosa boundary ends at Harris Dam, which is below the confluence of the Tallapoosa and Little Tallapoosa rivers. This boundary was drawn for the ease of conducting stakeholder meetings. Because of Wedowee's proximity to and association with Harris Reservoir (commonly referred to as Lake Wedowee), it was decided to draw the watershed boundaries a little differently.

EXHIBIT ES-3
Water Movement in Undeveloped and Developed Watersheds
From Center for Watershed Protection

Water Balance



There are four dams on the Tallapoosa that are owned and operated by APCo–R. L. Harris Dam, Martin Dam, Yates Dam, and Thurlow Dam.

The majority of land in the Tallapoosa Basin is still undeveloped. Approximately 84 percent of the watershed is forested and 13 percent is agricultural. Less than 1 percent of the Tallapoosa River Basin is urban. The majority of the urban land is located in Montgomery, Auburn-Opelika, Alexander City, Tuskegee, Dadeville, and Heflin.

Watershed Assessments

During this phase of the project, water quality data were reviewed to characterize the Tallapoosa watersheds. The watersheds also were prioritized to indicate those with the highest known or potential impairments; this prioritization was then used to guide the development of watershed strategies. Known impairments are those documented by credible scientific sources. Potential impairments are educated assumptions based on existing land uses, point sources, and historical problems.

How is the Quality of the Tallapoosa River Basin?

ADEM evaluates all available water quality data to determine whether a given water body meets its designated use(s) (fish and wildlife, swimming, water supply, etc.) and submits the analyses to EPA. In ADEM's latest report to EPA, there were eight impaired stream segments and one impaired embayment/ reservoir located in the Tallapoosa Basin.

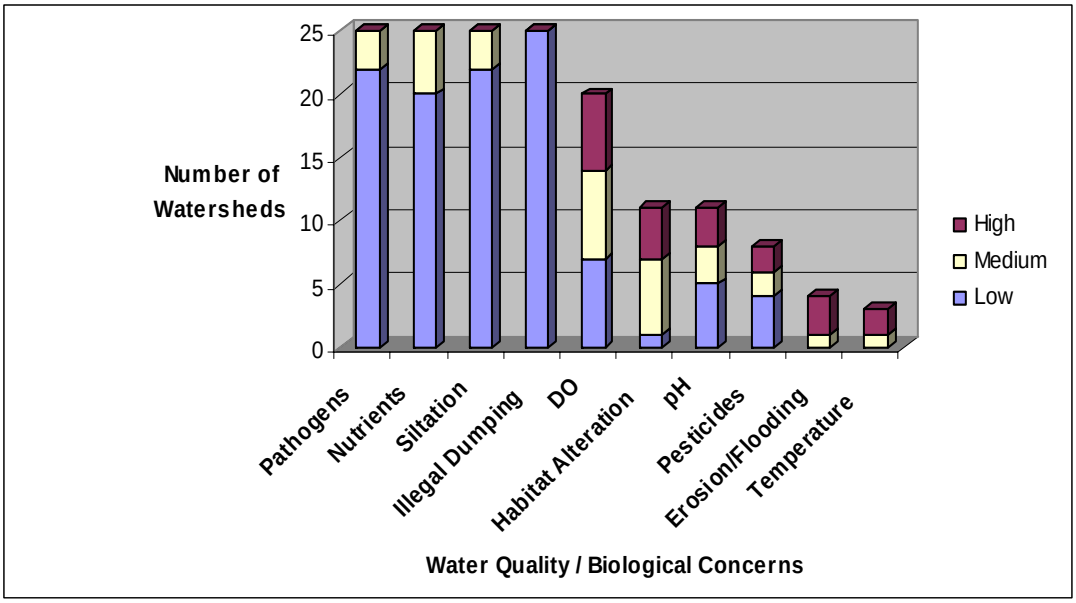
What is the Primary Cause of Water Quality Impairment in the Tallapoosa River Basin?

The results of the chemical data, habitat, and biological data review indicate that pathogen contamination, nutrient enrichment, siltation, and illegal dumping are the primary causes of degradation in most of the water bodies in the Tallapoosa River Basin. Exhibit ES-4 illustrates the water quality and biological concerns identified during the assessment process for each subwatershed in the Tallapoosa Basin and the priority assigned to each concern. For example, dissolved oxygen was identified as a concern in almost 20 subwatersheds and was prioritized as high, medium, and low one third of the time. However, illegal dumping is a concern in close to 25 subwatersheds and is always considered to be low priority. The nutrients and pathogens are estimated to come from the following sources: 1) concentrated animal feeding operations (CAFOs); 2) wastewater treatment plants (WWTPs); and 3) septic tank systems. Siltation is suspected of originating from: 1) urban development; 2) dirt roads and roadbanks; 3) livestock with access to streams; 4) silviculture, and 5) surface mining. Illegal dumping is seen as a concern in both urban and rural areas throughout the counties in the Tallapoosa Basin.

Watershed Management Strategies

Watershed management strategies are tools used to evaluate, safeguard, develop, or preserve the habitat or water resources to enable the use of these resources for the benefit of the watershed's residents. Management strategies are identified in Sections 4 through 6 to

EXHIBIT ES-4
Water Quality and Biological Concerns in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan



guide stakeholders in the watershed management process. These recommendations will enable growth to continue in the Basin, while protecting our water resources. The strategies were developed with input from stakeholders in the Tallapoosa CWP. This Executive Summary includes the strategies on which stakeholders in the Upper, Middle, and Lower Tallapoosa CWPs reached consensus. For the basin plan, the term consensus means that the stakeholders could live with the recommendation, but it did not necessarily mean that it was everyone's number one recommendation.

The strategies also were developed with consideration of federal and state regulations, which are outlined in Section 3. Local governments that adopt and implement the recommendations included in this basin management plan may be able to use the plan to meet all or a part of the requirements for post-construction runoff control in the federal Phase II storm water rules that are further described in Section 3.

The results of the assessment illustrate that the primary water quality concerns are nutrients, pathogens, siltation, and illegal dumping. The potential sources of those concerns are primarily urban development, improper agricultural or forestry practices, and surface mining. Exhibit ES-5 highlights some of the management strategies developed by stakeholders from each watershed. Refer to Sections 4 through 6 for a more complete list.

EXHIBIT ES-5
Selected Management Strategies from Stakeholders in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Parameter	Upper	Middle	Lower
Nutrients	Aid in the development of a rural septic management system on a county level by obtaining funding for alternative sewage treatment system demonstration projects	Encourage proper use of fertilizers in residential and public areas (golf courses) through educational campaign	Advocate the banning of detergents containing phosphates or taxing products with phosphates. Use education to encourage the use of phosphate-free products
Pathogens	Educate children and adults about septic system maintenance via door hangers, flyers, seminars, and classroom instruction and projects	Advertise and enforce the Alabama Clean Marina Initiative (availability and use of marina pump-out facilities)	Employ education about septic system maintenance (Business Partners Workshop for homeowners)
Siltation	Discourage dirt road subdivisions–work with local legislators to beef up subdivision regulations	Work with power company to discourage use of off-highway vehicles (OHVs) in lake and streams–place flyer in the bill	Initiate open space preservation (Land Trust of East Alabama)
Illegal Dumping	Continue the annual cleanup with Alabama Power Company's Renew Our Rivers program	Request that power company place trash bins at its boat ramps	Identify litter hot spots; report results to ADEM

Plan Adoption and Implementation Issues

Funding is required to implement some of the recommendations. This basin plan was developed using the best science available, but as more information is collected regarding water quality in the Basin and the effectiveness of watershed protection practices, the plan should be revisited to determine if any of the recommendations need to be revised. The Tallapoosa Steering Committee recommends reviewing the plan every 2 years and producing an addendum to reflect any changes. Currently, the ACWP Board of Directors recommends updating basin management plans every 5 to 8 years.

Implementation and Funding

A wide range of funding options is available to support watershed management activities in the Tallapoosa Basin. If it is to achieve long-term success, a watershed program needs a diversified funding base. Because public and private funders periodically cut or eliminate program funding, it is important that local governments, nonprofits, and volunteer organizations seek resources from multiple sources. Unlike programs with a single or small number of funders that may not be able to continue during times of fiscal restraint,

programs with multiple funding sources tend to withstand the test of time. These programs may not be able to undertake all planned activities, but because of the broad funding base, the overall program itself is able to continue and survive. Refer to Section 7, Funding Opportunities, for various funding options.

How Will We Know if the Watershed Plan is Working?

Performing long-term in-stream monitoring will enable the Tallapoosa CWP to identify trends in water quality and to determine how well the basin management plan is working once it is fully implemented. The CWP can then use the monitoring results to modify plan recommendations where needed and to modify watershed priorities as new information is obtained.

The long-term monitoring plan will build on the data that are already available in the Tallapoosa Basin. ADEM performs extensive biological monitoring in the basin. In addition, several Alabama Water Watch (AWW) groups monitor monthly and there are ongoing projects sponsored by Auburn and Tuskegee Universities, and other organizations such as APCo, MWWSSB, and AWWB that monitor routinely.

The basin management plan outlines monitoring objectives and a proposed monitoring approach that includes biological monitoring in rapidly developing watersheds, habitat monitoring, and limited chemical monitoring (refer to Sections 4 through 6).

Measures of Success

Exhibit ES-6 lists several "measures of success" that can be used to determine the progress of this basin management program. The measures are broken into two categories, education/outreach and water quality/biological. Some measures fit into both categories.

EXHIBIT ES-6
Measures of Success
Tallapoosa River Basin Management Plan

Measure of Success	Tracking Mechanism
Education/Outreach	
Distribution of educational materials and presentations to: – Cities/chambers of commerce – Counties – Universities/colleges (science clubs, science departments) – Land Trusts – Private Industry – AWW groups – County Public Health Departments – County ACES offices	Track organizations to which educational materials were disseminated and presentations were given.

EXHIBIT ES-6
Measures of Success
Tallapoosa River Basin Management Plan

Measure of Success	Tracking Mechanism
Increased attendance and participation at stakeholder meetings:	Track attendance and number of groups represented
– Quarterly activities such as:	
– Stream cleanups	Track stream miles cleaned
– Storm drain stenciling	Track number of storm sewers stenciled
– Classroom presentations	Track number completed or number of students
– Tours of demonstration projects	Track number of tours or number of attendees
– Participation in water festival and other water-related events	Track number of events attended
Annual newsletter	Track number of stakeholders on distribution list
School-based programs	Track number of school events
Routinely update/maintain Tallapoosa CWP website	Track number of updates to the website
Increased citizen monitoring	Track sites, parameters, frequency, and number of monitors
New organizations represented at CWP meetings	Track numbers of new stakeholders in attendance
Water Quality/Biological	
Water bodies/parameters removed from the 303(d) list	Track number removed
Improving trends of water quality as compared to ADEM water quality criteria	Track number of stations with improved water quality
Reduction in nutrient loadings in lower Harris Reservoir, lower Martin Reservoir, Yates Reservoir/Sougahatchee Embayment	Track number of stations with reduced nutrient concentrations
Reduction in siltation/habitat alteration	Track number of stations with improved habitat assessment scores and sediment deposition metric
Draft watershed-based management plans	Track number of watershed-based plans
Implement watershed-based plans	Track numbers and types of BMPs implemented
Installation of on-the-ground projects	Track numbers of projects Estimate load reductions by monitoring or modeling
Identification and cleanup of dump sites	Track numbers of sites identified and cleaned up

Notes:
ADEM = Alabama Department of Environmental Management
BMP = best management practice
AWW = Alabama Water Watch
ACES = Alabama Cooperative Extension Service

1. Introduction

1. Introduction

The Tallapoosa River Basin contains some of the highest quality water in Alabama. This river contains reservoirs that bring millions of tourist dollars to the state in addition to providing quality drinking water. Protecting this water resource is essential. Although the Tallapoosa River is known for its clean water, there are streams in this river basin that are impaired and in need of restoration. Furthermore, growth is occurring in certain portions of the watershed, particularly around the cities of Montgomery and Auburn-Opelika, the western fringes of the Atlanta metropolitan area in Cleburne and Randolph counties, and Elmore County. Although numerous benefits are associated with gains in economic development, there also are accompanying pressures on the Tallapoosa River's water resources. This plan describes the current water quality within the Tallapoosa River Basin and outlines strategies to restore and protect the water resources.

Basin management planning is a holistic approach used to manage, protect, and restore aquatic resources. This basin management plan is being coordinated through the Alabama Clean Water Partnership (ACWP) with a Section 319 grant from the Alabama Department of Environmental Management (ADEM) and the U.S. Environmental Protection Agency (EPA). The ACWP is a statewide, non-profit organization that serves to encourage watershed education, restoration, and protection by bringing together diverse stakeholders within a watershed to discuss water quality issues and to implement consensus-based, voluntary watershed management strategies. In addition to the statewide Clean Water Partnership (CWP) organization, the stakeholders who live, work, and recreate in the Tallapoosa Basin have played an integral part in the development of this plan.

Background

A watershed includes the land area draining into a body of water. Everything that happens within a watershed has an effect on water quality. Everyone lives and works within a watershed and, therefore, affects water quality. Steps can be taken to minimize adverse impacts on water quality, and this basin management plan outlines several strategies for the protection of the water resources within the Tallapoosa River Basin.

*A **watershed** includes the land area draining into a body of water. All of our daily activities take place in watersheds.*

It is important to protect the Tallapoosa's water resources, because we depend on water from the basin for our daily needs. To safeguard our water resources, we must protect our watersheds. Watersheds provide the community with many uses, including the following:

- **Drinking water supply**–Portions of the Tallapoosa are used as drinking water supplies. Protecting the water quality in the basin helps protect public health. In addition, maintaining certain levels of water quality can help reduce treatment costs.

- **Agricultural uses**–Water in the Tallapoosa River Basin is used to provide drinking water to animals and to irrigate crops.
- **Industrial uses**–Water is withdrawn to provide industries with the water they need to run their businesses.
- **Recreation and tourism**–Watersheds provide recreation sites for Alabama's citizens. Water-related activities such as swimming, boating, and fishing are provided. In addition, hiking along trails, biking along greenways, and other forms of recreation in parks and open space areas are provided by watersheds. Recreational areas around lakes can bring the economic benefits of tourism.
- **Economic Benefits**–The four reservoirs on the Tallapoosa River add significant economic value by providing lake front property and a viable tourism industry.
- **Drainage**–Watersheds move water. Properly maintained watersheds are more proficient at absorbing and/or moving water during storms, which minimizes flood damage to property.
- **Habitat**–Healthy watersheds provide both aquatic and terrestrial **habitat for wildlife**.

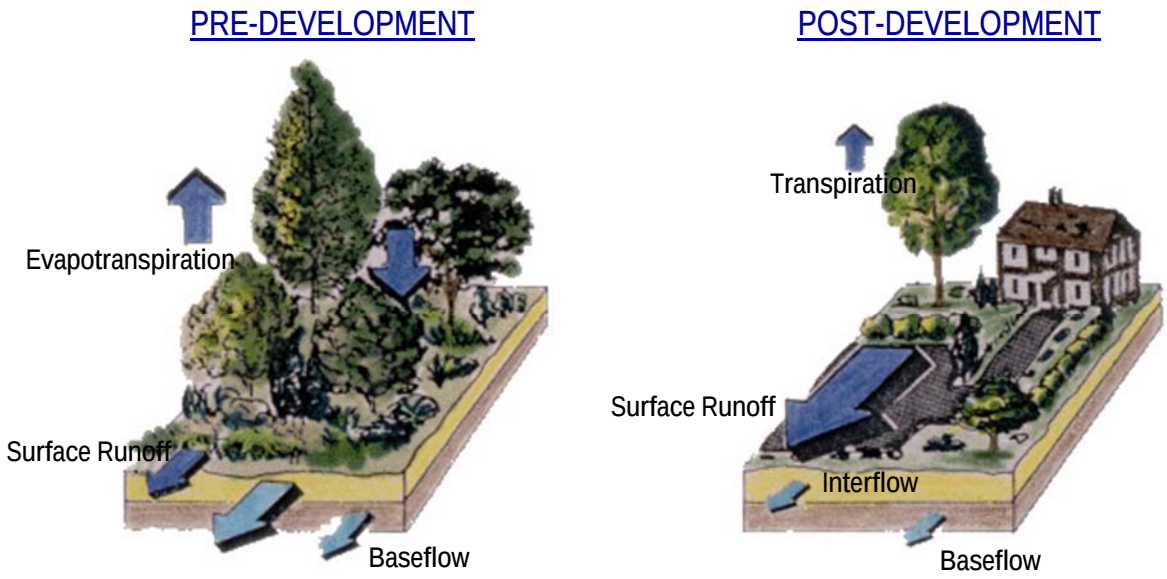
A healthy river basin is better equipped to provide the above-mentioned benefits to the stakeholders. Because a watershed includes the land that drains to a water body, the activities on the land surface affect water quality and quantity. As land changes from a natural forested environment to environments designed to meet human needs such as farmland, managed forests, and urban areas, pollutant loads from the land increase.

Impervious surfaces *are hard surfaces, such as roads and rooftops that prevent rainfall from soaking into the ground. As we increase the amount of impervious surfaces in a watershed, we change the way water moves within the watershed. This change affects water quality and quantity.*

Changed hydrology that occurs with urbanization is a major source of water quality degradation. As land is developed, there is more area that is impervious (incapable of being penetrated by water; non-porous) with the additional roads, parking lots, and buildings that are created to accommodate the growth. With increased imperviousness, less rainfall can infiltrate the soils, meaning that fewer pollutants are absorbed and filtered by the vegetation and soil, which affects water quality. This increased imperviousness results in an increased storm water flow washing across the land and directly into the Basin's urban streams. The higher storm water flows result in increased flooding that damages property and threatens or claims lives. Higher storm flows within streams cause higher in-stream erosion, which impairs aquatic habitat and results in reduced aquatic biodiversity. Finally, with less water infiltrating soils, there is less water reaching groundwater, which provides the stream baseflow during periods with little rain. Thus, this changed hydrology can exacerbate droughts. Exhibit 1-1 illustrates some of the movement of water in developed and undeveloped watersheds.

EXHIBIT 1-1
Water Movement in Undeveloped and Developed Watersheds
From Center for Watershed Protection

Water Balance



To keep the watershed functions intact, it is necessary to maintain them, just as it is necessary to maintain roads, schools, water distribution systems, and other infrastructure that provides services to citizens. The following activities are necessary to ensure that our watersheds continue to function properly and provide us with clean water for drinking, agriculture and other businesses; to accommodate storm water; to provide recreation; and to provide natural habitat:

- **Planning**–Proper planning ensures that development occurs within the basin in a manner that will protect water resources.
- **Capital investment**–Capital investments must be made to install best management practices (BMPs), to purchase buffers and other open space, to stabilize stream banks and restore aquatic habitat where needed, and to implement other watershed management activities.
- **Monitoring**–The Tallapoosa's water bodies must be monitored to evaluate whether they are healthy and whether additional planning work is needed to protect them.
- **Maintenance**–BMPs that are installed to protect water quality must be maintained to function properly.

Goal of the Plan

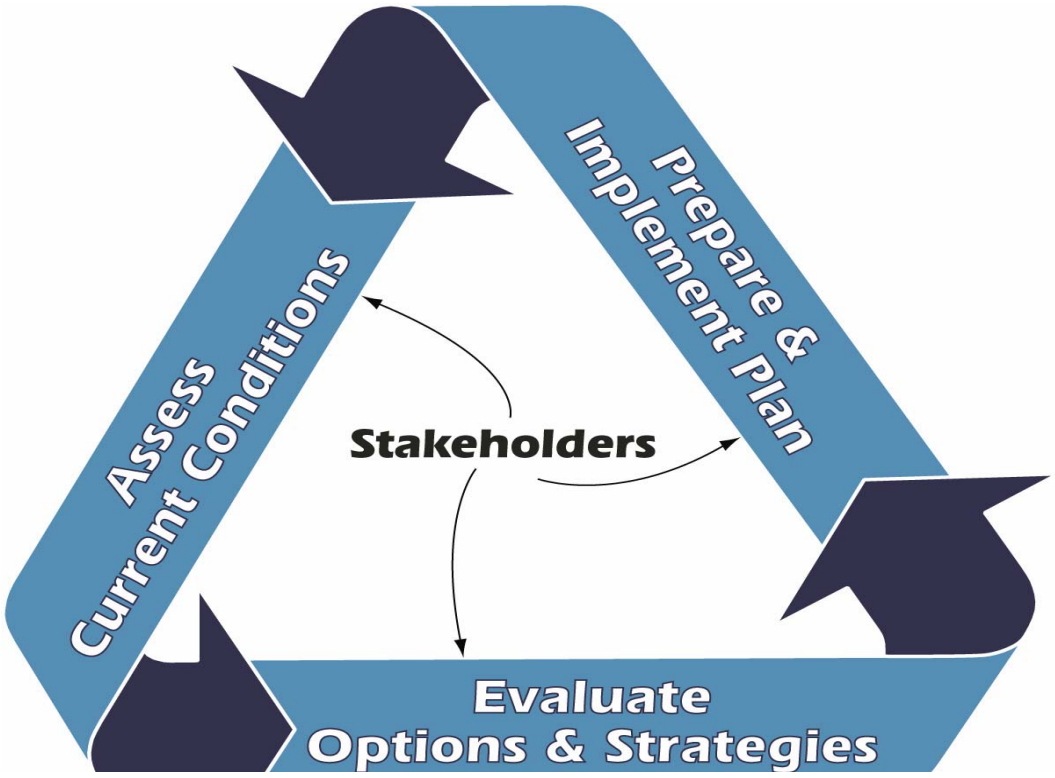
The goal of this plan is to guide "on-the-ground" projects that will improve, maintain, and protect the Tallapoosa River Basin to accomplish the following:

- Move toward meeting all applicable water quality standards
- Sustain water uses
- Maintain and protect aquatic biotic integrity, endangered species and their habitat

Basin Plan Development Process

A three-step process was used to develop the river basin management plan, as illustrated in Exhibit 1-2. Exhibit 1-2 shows that the watershed planning process is iterative. This plan is intended to change over time as additional data are obtained regarding the watersheds and more is learned about the effectiveness of various management strategies. Stakeholder input was obtained throughout this phase of the project, and should continue as the plan is implemented and the watershed planning cycle continues. Additional information about each step is provided below.

EXHIBIT 1-2
Basin Plan Development Process
Tallapoosa River Basin Management Plan



Stakeholder Involvement

A Technical Subcommittee was formed in the Upper Tallapoosa River section to provide input to the plan. The existing Technical Subcommittees of the Middle and Lower Tallapoosa River sections served to provide stakeholder input, as well. These groups included landowners, developers, citizens groups, private industry, and government representatives. Meetings were held monthly or bimonthly with each of these groups, with discussion centering around data collection, watershed assessment, management strategy recommendations, and plan development. Regular updates regarding the progress of the plan were presented to the Upper, Middle, and Lower Tallapoosa Stakeholder Committees. These committees meet monthly, bimonthly, or quarterly. In addition, the Tallapoosa River Basin Steering Committee, which included policy makers, met to discuss the basin management plan. Finally, the Education and Outreach Subcommittees in the Middle and Lower Tallapoosa River sections provided input about ways to develop methods to educate the public regarding watershed issues.

Assess Current Conditions

During the assessment phase of the project, existing data were obtained and reviewed. The online ACWP Dataviewer was used to facilitate this process. Additional data from ADEM, the U.S. Geological Survey (USGS), Geological Survey of Alabama (GSA), Alabama Water Watch (AWW) citizen groups, Auburn University, Tuskegee University, Soil and Water Conservation Districts (SWCDs), and several other data sources were used. Water quality (dissolved oxygen [DO], fecal coliform, etc.), biological (fish Index of Biotic Integrity [IBI], habitat assessment, and benthic macroinvertebrates), and other watershed-related data (agriculture, forestry, etc.) were collected and input into the database used for the online Dataviewer in each river section. These data were reviewed and indicated that, overall, the Tallapoosa River Basin has good water quality, with few water quality standard violations. These impaired areas should be prioritized for BMPs that will help restore them. More information is provided in Sections 4 though 6.

Evaluate Options and Strategies

Various management strategies were evaluated during this phase of the project and discussed with the stakeholders. Recommended strategies and the monitoring plan to assess the effectiveness of them are described in Sections 4 through 6.

Prepare Plan

The basin management plan was prepared based on the results of the assessment portion of the project, the recommended strategies, and the feedback from the stakeholders. The plan should be implemented as resources are obtained, and monitoring should occur to evaluate the effectiveness of the strategies.

2. Overview of the Tallapoosa River Basin

2. Overview of the Tallapoosa River Basin

Physical Characteristics

The Tallapoosa River Basin comprises the 4,675-square-mile watershed of the Tallapoosa River. Approximately 15 percent (650 square miles) of the basin's drainage area lies in Georgia, where the river's headwaters originate. The headwaters of the Tallapoosa and Little Tallapoosa rivers begin in the Georgia counties of Paulding and Carrol, respectively, and enter Alabama in Randolph County southwest of the City of Atlanta to form the R. L. Harris Reservoir (commonly referred to as Lake Wedowee) and the main stem of the river. From the confluence of these two rivers, the Tallapoosa meanders southwesterly through four Alabama Power Company (APCo) hydropower projects (reservoirs) before joining the Coosa River to create the Alabama River. The Alabama portion of the basin drains 4,025 square miles of land.

The river basin is divided into three major segments or "cataloging units" designated by the 8-digit hydrologic unit codes (HUCs) 03150108 (Upper Tallapoosa), 03150109 (Middle Tallapoosa), and 03150110 (Lower Tallapoosa). Exhibit 2-1 shows the counties and cities included in the Tallapoosa River Basin. The Tallapoosa CWP has designated "river section" boundaries that differ somewhat from the hydrologic boundaries originally defined by the USGS. The CWP Upper Tallapoosa boundary ends at Harris Dam, which is below the confluence of the Tallapoosa and Little Tallapoosa rivers. This boundary was drawn for the ease of conducting stakeholder meetings. Because of Wedowee's proximity to and association with Harris Reservoir (commonly referred to as Lake Wedowee), it was decided to draw the watershed boundaries a little differently.

The main stem of the Tallapoosa River originates in Paulding County, Georgia, 40 miles west of Atlanta, at an elevation of 1,145 feet. As illustrated by the river's profile (Exhibit 2-2), the river descends at approximately twice the rate (or an average of 3.4 feet per mile) in the Upper and Middle segments of the basin compared to a more gradual gradient, which averages 1.6 feet per mile below the Fall Line in the Lower segment (Draft Alabama-Coosa-Tallapoosa [ACT] Environmental Impact Statement [EIS], U.S. Army Corps of Engineers [COE], 1998).

Four dams on the Tallapoosa are owned and operated by APCo–R. L. Harris Dam, Martin Dam, Yates Dam, and Thurlow Dam. Exhibits 2-2 and 2-3 describe the reservoir profile at each dam. Exhibits 2-4 and 2-5 describe other impoundments in the Tallapoosa River Basin.

EXHIBIT 2-1
Tallapoosa River Basin
Tallapoosa River Basin Management Plan

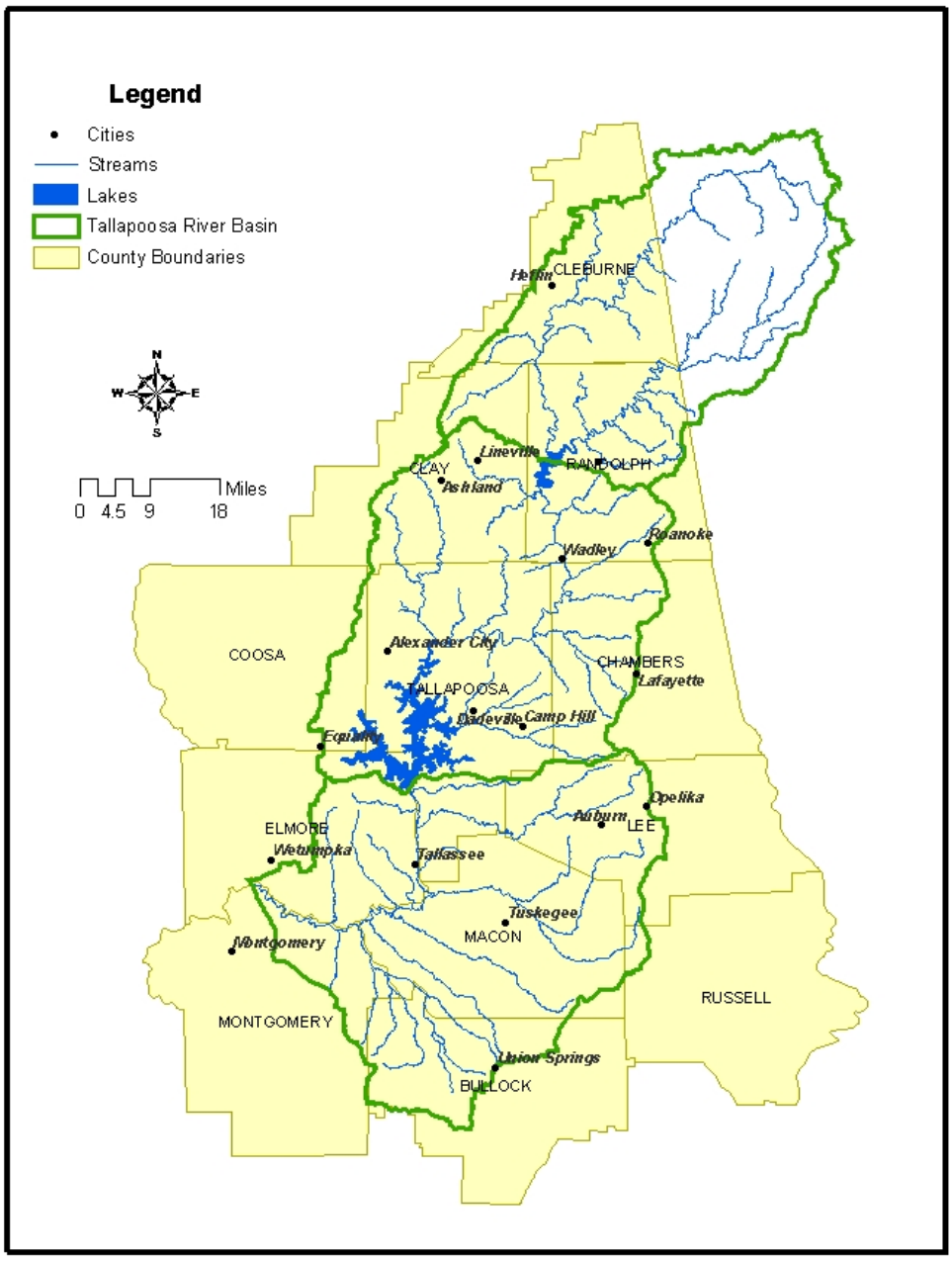


EXHIBIT 2-2
Tallapoosa River Profile
Tallapoosa River Basin Management Plan

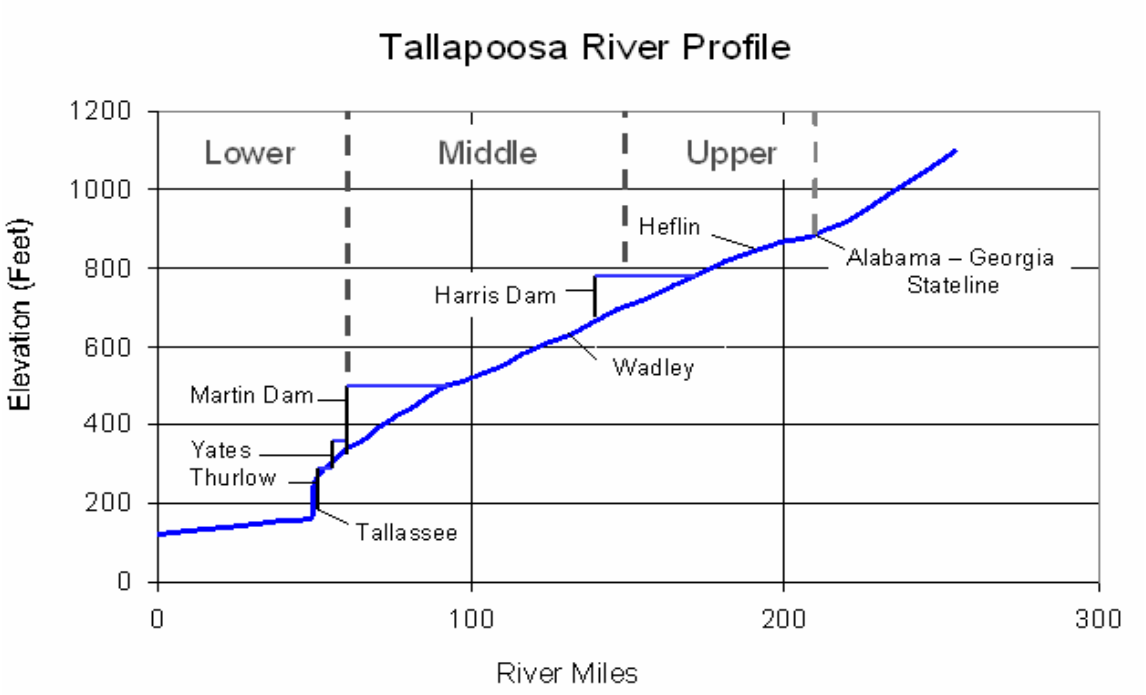


EXHIBIT 2-3
Existing Main Stem Dams and Reservoirs in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Basin/River/ Project Name	Year Completed	Drainage Area (square miles)	Reservoir Size (ac)	Total Max. Reservoir Storage (ac-ft)	Normal (Summer) Lake Elevation (ft)
Tallapoosa River		4,675			
Harris Dam and Lake	1983	1,453	10,660	425,700	793
Martin Dam and Lake	1926	3,000	40,000	1,622,000	490
Yates Dam and Lake	1928	3,293	1,980	26,000	344
Thurlow Dam and Lake	1930	3,320	585	11,000	289

Notes:
ac = acre
ac-ft = acre-feet
ft = feet
Source: USGS. 2002. *Environmental Setting and Water-Quality Issues of the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee*.

EXHIBIT 2-4
Existing Reservoirs in the Tallapoosa River Basin not on Mainstem
Tallapoosa River Basin Management Plan

County	Stream
Clay	Crooked Creek
Cleburne	Cahulga Creek
Randolph	High Pine Creek

Note:
Source: Draft ACT EIS, 1998

EXHIBIT 2-5
State-owned and Operated Public Fishing Lakes
Tallapoosa River Basin Management Plan

County	Fishing Lake	Acres
Chambers	Chambers County Lake	183
Clay	Clay County Lake	74
Lee	Lee County Lake	130

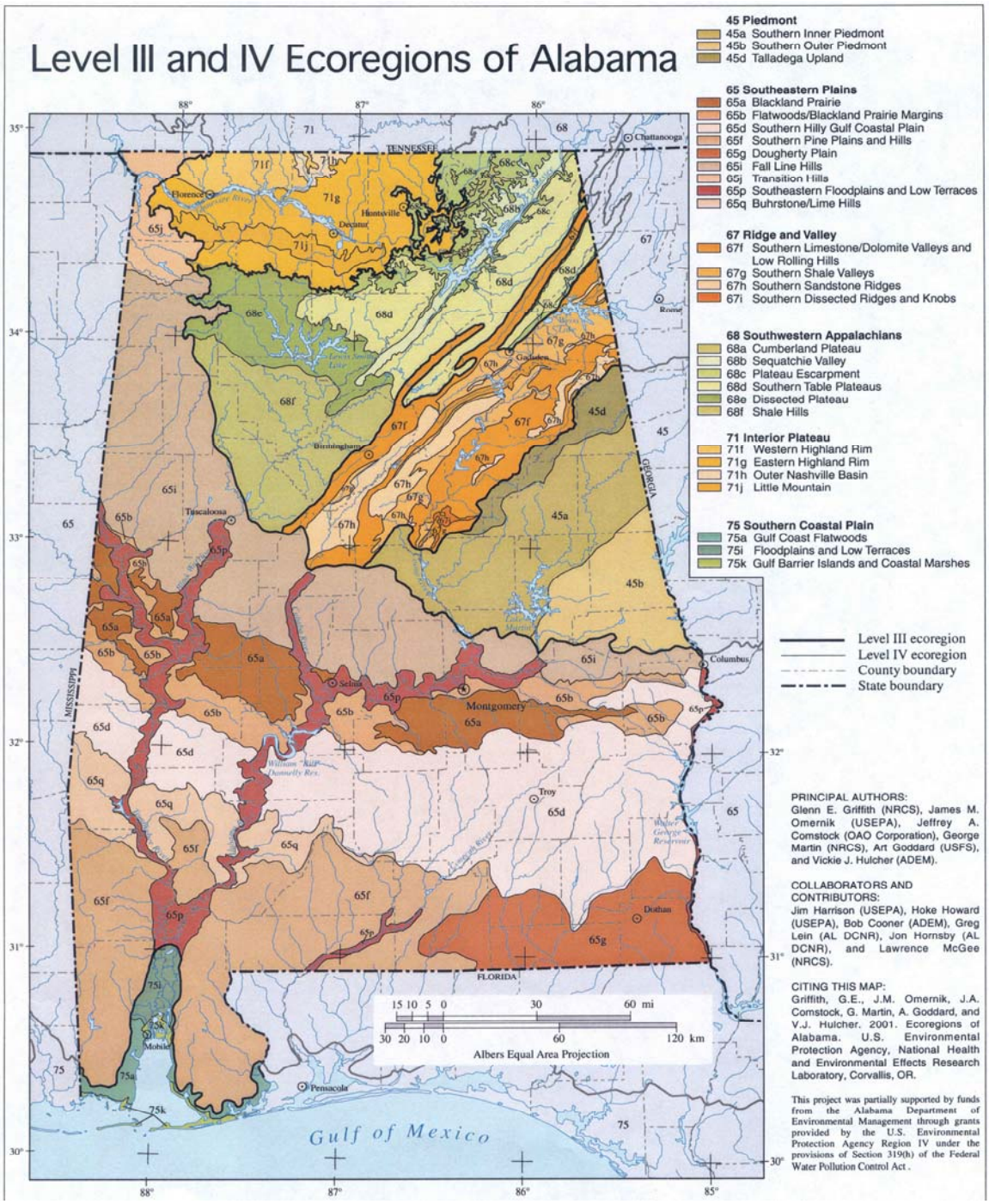
Notes:
Source: ADEM 2002 Water Quality Report to Congress (Clean Water Act §305(b) Report).

Geological and Ecological Features

As illustrated in Exhibits 2-6 and 2-7, the Tallapoosa River Basin lies within two ecoregions, beginning in the Piedmont (45) and ending in the Southeastern Plains (65). An ecoregion is an ecologically homogenous area delineated by similar physiography, geology, climate, and potential natural vegetation. Potential natural vegetation describes what is likely to grow in an area if it is left undisturbed without extreme or unusual weather conditions.

Most of the Tallapoosa Basin is within the Piedmont, a transitional plateau between the mountains and the coastal plain. This area has predominantly metamorphic and igneous rocks (such as granite and schist), clayey subsoils with sandy loam or clay loam surface layers. The topography is hilly and occasionally steep. Once heavily cultivated, much of the

EXHIBIT 2-6
Alabama Ecoregions Map
Tallapoosa River Basin Management Plan



Source: Griffith, G. E., J. M. Omernik, J. A. Comstock, S. Lawrence, G. Martin, A. Goddard, V. J. Hulcher, and T. Foster. 2001. *Ecoregions of Alabama and Georgia* (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,700,000).

EXHIBIT 2-7
Piedmont (45) and Southeastern Plains (65) Level IV Ecoregions of Tallapoosa River Basin, Alabama
Tallapoosa River Basin Management Plan

	Physiography	Elevation / Local Relief (ft)	Geology	Soil Series	Climate: Precipitation Mean Annual (inches)	Climate: Frost Free Mean Annual (days)	Climate: Mean Temperature January min/max; July min/max (°F)	Potential Natural Vegetation	Land Use and Land Cover
45 Piedmont									
45a Southern Inner Piedmont	Dissected irregular plains, tablelands of moderate relief, open hills; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates	350-1710 / 200-400	Quaternary to Tertiary micaceous clay, sandy clay, and sandy saprolite, with rock outcrops and joint-block boulders; Precambrian to Paleozoic schist, gneiss, granite, amphibolite, and phyllite	Madison, Louisa, Tatum, Badin, Tallapoosa, Cecil, Grover, Davidson, Pacolet; on floodplains Chewacla, Cartecay, Toccoa, Enoree	52-58	195-220	31/54 67/90	Oak-hickory-pine forest	Deciduous forest, mixed forest, pine plantations, pasture; hay, cattle, and poultry production
45b Southern Outer Piedmont	Dissected irregular plains; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates	335-945 / 100-300	Quaternary to Tertiary argillaceous saprolite, quartz-rich saprolite, micaceous saprolite; Precambrian to Paleozoic schist, gneiss, granite, and amphibolite	Cecil, Madison, Pacolet, Lloyd, Appling, Davidson, Wilkes, Gwinnett, Ashlar; on floodplains Chewacla, Toccoa, Enoree, Cartecay	46-56	205-225	31/55 67/90	Oak-hickory-pine forest	Mixed forest, pine plantations, pasture; hay and cattle production
45d Talladega Upland	Open high hills, some northeast-trending linear ridges, rolling plateau; moderate to high gradient streams with bedrock, boulder, cobble, gravel, and sand substrates	500-2407 / 300-1000	Quaternary to Tertiary micaceous saprolite and silty, clayey, or sandy saprolite; Precambrian to Paleozoic phyllite, quartzite, slate, metasiltstone, and metaconglomerate	Tatum, Tallapoosa, Badin, Fruithurst, Cheaha	54-64	185-210	28/51 65/89	Oak-hickory-pine forest	Mixed forest, pine plantations, large areas of public land (Talladega National Forest), recreation, forestry
65 Southeastern Plains									
65a Blackland Prairie	Undulating irregular plains, nearly level to strongly sloping; low gradient streams with chalk, clay, sand, and silt substrates	120-360 / 50-100	Quaternary to Tertiary dark gray to reddish clay solution residuum over Cretaceous-age chalk, marl, and calcareous clay	Sumter, Vaiden, Oktibbeha, Kipling, Demopolis, Sucarnoochee, Houston, Hannon, Okolona	52-56	220-240	34/56 69/91	Blackbelt forest of sweetgum, hackberry, oak, cedar; patches of bluestem prairie	Pasture and cropland with hay, soybeans, corn, cotton, and pond-raised catfish production; small patches of mixed hardwoods, cedar, and pine
65b Flatwoods/ Blackland Prairie Margins	Smooth lowland plains and undulating irregular plains; sluggish, low gradient, clay and sand bottomed streams	100-520 / 50-150	Quaternary to Tertiary massive clay decomposition residuum, silty, medium to fine sand and sandy clay decomposition residuum; Tertiary massive, plastic clay, calcareous clayey sand, Cretaceous micaceous fine sand, chalk, and marl	Wilcox, Mayhew, Vaiden, Sumter, Kipling, Consul, Sucarnoochee, Oktibbeha, Conecuh	52-56	220-240	34/56 69/91	Oak-hickory-pine forest	Mixed forest, pine plantations, pasture, hay, and some cropland
65d Southern Hilly Gulf Coastal Plain	Dissected irregular plains, northward facing cuestas, low hills with broad tops; some wide floodplains and broad, level to undulating terraces; low to moderate gradient mostly sandy bottomed streams	70-680 / 100-300	Quaternary fine to coarse sand, sandy clay, and ferruginous clayey coarse sand decomposition residuum; Tertiary sand, clay, silt, limestone, and lignite; Cretaceous sand, clay, lignite	Lucy, Bonifay, Dothan, Fuquay, Nankin, Troup, Orangeburg, and Springhill in the east; Bama, Luverne, Smithdale, Savannah, Conecuh, and Lucedale in the east; Iuka, Bibb, Kinston, Mantachie on floodplains	52-59	220-245	34/57 69/91	Oak-hickory-pine forest, southern mixed forest, some southern floodplain forest	Mostly mixed forest and pine plantations, some small intermixed areas of pasture and fields of hay, cotton, peanuts, corn, and soybeans; some poultry

EXHIBIT 2-7
Piedmont (45) and Southeastern Plains (65) Level IV Ecoregions of Tallapoosa River Basin, Alabama
Tallapoosa River Basin Management Plan

	Physiography	Elevation / Local Relief (ft)	Geology	Soil Series	Climate			Potential Natural Vegetation	Land Use and Land Cover
					Precipitation Mean Annual (inches)	Frost Free Mean Annual (days)	Mean Temperature January min/max; July min/max (°F)		
65i Fall Line Hills	Dissected open hills with rounded tops; gently sloping to strongly sloping side-slopes; low to moderate gradient streams with sandy and gravelly substrates	200-1000 / 200-400	Quaternary medium to coarse sand and gravel decomposition residuum; Cretaceous quartz sand, gravelly sand, micaceous clay	Cowarts, Uchee, Marvyn, Orangeburg, Springhill, Lucy, and Nankin in the east; Smithdale, Luverne, Savannah, Bama, Maubila, and Saffell in the west; Bibb, Kinston, Iuka, Mantachie on floodplains	53-59	210-240	30/51 68/91	Oak-hickory-pine forest	Mixed forest and pine plantations, with areas of pasture and hay; minor areas of cultivated cropland of corn, soybeans, and cotton
65p Southeastern Floodplains and Low Terraces	Major river floodplains and associated low terraces; low gradient streams with sandy and silty substrates, oxbow lakes, ponds, swamps	10-250 / 5-25	Quaternary alluvial gravelly sand, quartz gravel and sand, silts, and clays	Urbo, Una, Cahaba, Mooreville, Izagora, Riverview, Kolomoki, Chrysler, Annemaine	54-64	225-270	32-36/54-58 68/91	Southern floodplain forest	Deciduous forest, forested wetlands, pine plantations on floodplains; cropland and pine plantations on terraces

Notes:
ft = feet
°F = degrees Fahrenheit
Source: www.epa.gov/wed/pages/ecoregions/alga_eco.htm

area now supports its potential natural vegetation of oak, hickory, and pine forest. Below the Piedmont's Fall Line, the Tallapoosa River cuts through the Southeastern Plains. These irregular alluvial plains are underlain by permeable sands and gravel. The upper plains' topography varies from rolling hills to broad terraces. Most of the basin is covered by oak, hickory, and pine and southern mixed forest, although some land is agricultural.

Climate

The general climate in the Tallapoosa River Basin is conducive to agriculture, outdoor leisure, and recreation activities and industries that require year-round outdoor work. This basin generally has a moist yet temperate climate. Precipitation is usually in the form of rain. Snowfall is rare. Insufficient rainfall may occur every 10 to 15 years. Rainfall is not necessarily evenly distributed throughout the Tallapoosa Basin. Annual rainfall amounts typically range between 46 to 64 inches, with the higher amounts occurring in the Talladega Upland and Coastal Plain areas of the Upper and Lower Basin segments, respectively. However, periods of drought or severe subtropical depression events can result in annual totals that vary considerably from norms. For example, annual rainfall amounts between 27 and 79 inches have been recorded at Thurlow Dam in Tallassee, Alabama, and between 34 to 76 inches at Hightower, Alabama. Precipitation is usually highest in late winter and early spring and lowest during the fall months. March is generally the wettest month and October is usually the driest. About half of the water falls as precipitation and is returned to the atmosphere as evapotranspiration.

According to climatological data in the Randolph County Soil Survey compiled at Rock Mills, Alabama, the average normal daily temperatures range from a high of 58 degrees Fahrenheit (°F) to a low of 35 °F in January. During the month of July, temperatures vary between 92 °F and 67 °F. Although the monthly average highs in June, July, and August exceed 90 °F, this temperature range generally occurs, on average, only 87 days per year. There is a 50 percent probability that the last occurrence of freezing temperatures in the spring will be on or before April 7, with the first freeze in the fall occurring on or after November 2, resulting in an average growing season of nearly 209 days. Historic records show that freezing temperatures occur on an average of only 51 days per year.

Overall, extreme hot and cold weather does not pose significant threats to outdoor activities within the Tallapoosa River Basin. However, extreme rainfall and temperature events can affect water quality and aquatic and riparian habitats both directly and indirectly.

Water Resources

The Tallapoosa River Basin drains 4,675 square miles of land area. It flows through 12 counties in Alabama (Clay, Cleburne, Randolph, Chambers, Coosa, Lee, Elmore, Tallapoosa, Macon, Bullock, Montgomery, and Russell) (Exhibit 2-1) (ADEM, 2000, *Surface Water Quality Screening Assessment of the Tallapoosa River Basin*). The water resources of the basin include the Tallapoosa River and its tributaries, reservoirs in the river basin, and groundwater resources that may interact with these surface water systems. The water quantity, water quality, and ecological integrity of these resources are inextricably linked. Significant interaction between surface and groundwater provides substantial base flow for many

streams. The management of pool levels and discharges from reservoirs also greatly affect the basin's surface water hydrology. The quality and quantity of these surface waters and groundwater fulfill both beneficial use and non-use needs that are of critical importance to the health, welfare, and safety of all within the basin and those affected downstream.

Water Quality

The collection and analysis of water quality data is a crucial step in the process of preparing a water resource management and protection plan. Unfortunately, water quality data can be limited, especially for smaller streams and water bodies in rural areas.

Existing data were reviewed to develop an assessment of the subwatersheds in the Tallapoosa River Basin (Appendix A). In general, the health of a water body is defined in terms of four categories of information:

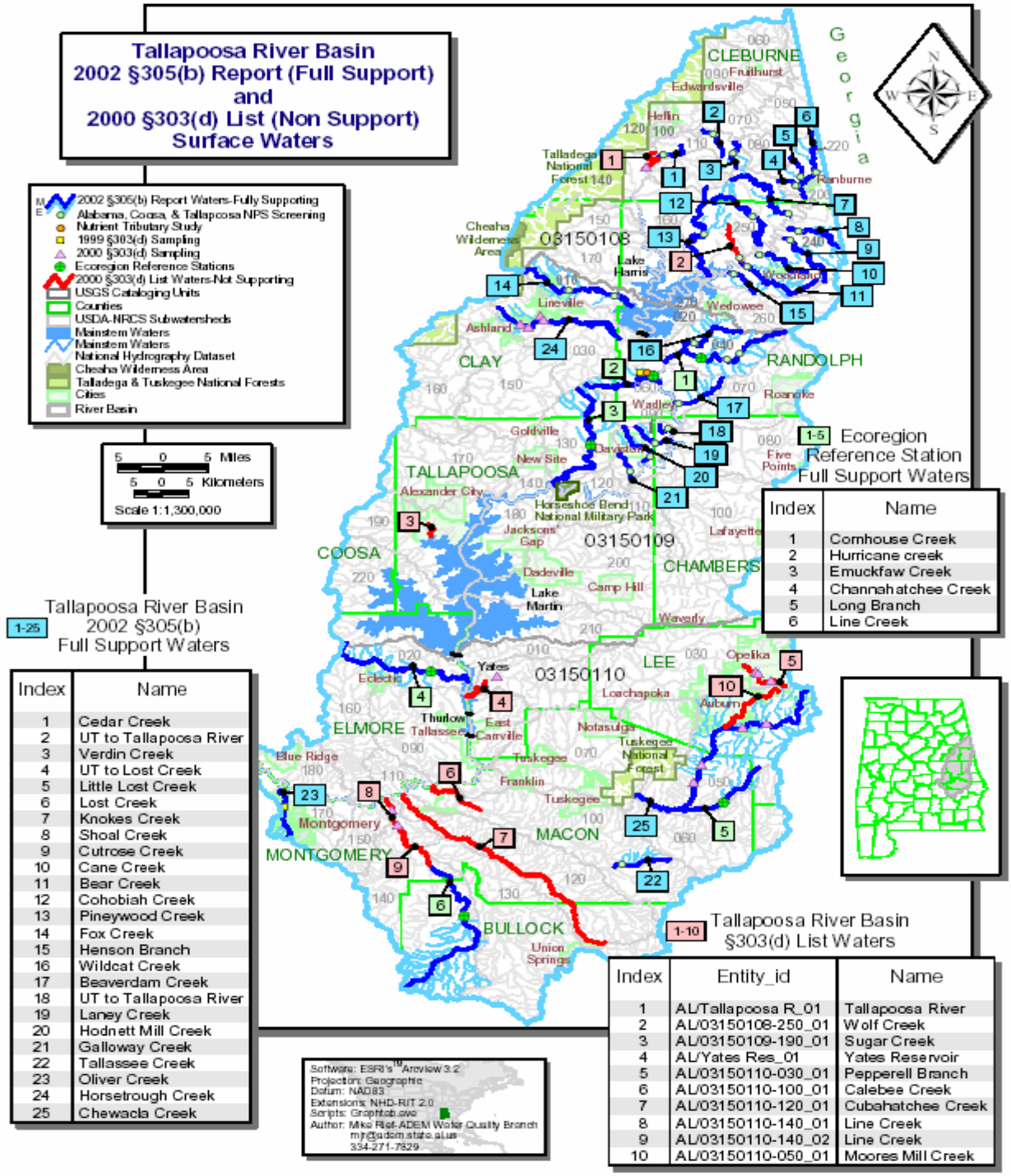
1. Chemical data–By comparing available chemical data to water quality criteria, one can determine whether specific pollutants may be causing impairments to streams and reservoirs.
2. Biological data–By examining the numbers and types of species that are sensitive to various aspects of water quality, and by examining the overall number of organisms collected, biologists can evaluate the health of a water body.

Low biological health can be caused by chemical pollutants or habitat degradation. Habitat degradation can be caused by sediment or changed hydrology associated with development.

3. Physical characteristics–There are two main physical characteristics that help characterize water quality: habitat and geomorphology. By examining aquatic habitat, scientists can assess if a water body cannot support a healthy biological community, even if water quality is good. Geomorphology is the study of landforms, and a stream's slope, shape, and sediment size determine how sediment is transported and deposited. Some streams will remain relatively stable while others will become unstable and subject to channel erosion with even small changes in the landscape.
4. Anecdotal data–By reviewing data obtained from SWCD county watershed assessments, as well as information gathered from state agencies, city and county engineers, and other municipal personnel, potential water quality and biological concerns can be identified.

These types of data, along with land use data and natural resource information, are summarized in Sections 4 through 6. An analysis of existing data showed that there are not enough data available to thoroughly examine current water quality and biological conditions in most of the Tallapoosa Basin. Efforts have been made by ADEM, SWCD, Water Works and Sanitary Sewer Board of the City of Montgomery (MWWSSB), Auburn Water Works Board (AWWB), Auburn University, Tuskegee University, AWW, USGS, GSA, and others to assess the streams within the basin using biological indicators and water quality data from streams, point sources, and nonpoint sources (NPSs). Most of the river basin is forested; therefore, most of the streams are in good condition with the exception of some streams located in urban areas or adjacent to industrial land uses (Exhibit 2-8).

EXHIBIT 2-8
Tallapoosa River Basin–ADEM Surface Water Assessments (2000 and 2002)
Tallapoosa River Basin Management Plan



Source: ADEM (2002) 305b Report to Congress

According to ADEM's 2004 §305(b) report, sampling data were collected from 1,932 sites in 2002 and from 2,037 sites in 2003. Exhibit 2-8 displays the stream segments that are on the 2000 §303(d) list. It also highlights the ecoregion reference stations, the 2002 §305(b) full support waters, and several ADEM monitoring stations (note that 303(d)-listed streams in the Tallapoosa Basin have not changed significantly since 2000).

There are nine stream segments on the Draft 2004 §303(d) List for Alabama (Appendix B). One segment is in the Upper Tallapoosa, one segment is the Middle Tallapoosa, and the remaining seven segments are in the Lower Tallapoosa. These impaired streams are listed for nutrients, organic enrichment (OE)/low DO, chlorine, siltation, and other habitat alteration.

In the Tallapoosa River Basin, ADEM has developed total maximum daily loads (TMDLs) for Wolf Creek, Tallapoosa River, Line Creek, Moore's Mill Creek, Yates Reservoir/ Saugahatchee Creek Embayment, Pepperell Branch, Calebee Creek, and Cubahatchee Creek. A TMDL for Sugar Creek is planned for completion in 2004.

There are four significant publicly owned lakes in the Tallapoosa Basin. The 305(b) report lists Harris as mesotrophic and Martin, Yates, and Thurlow as oligotrophic. The trophic status index (TSI) is determined based on 1985 through 2002 mean values from dam forebay stations during August and September. More details regarding the lakes are provided in Sections 4 through 6.

Water Quantity

Surface Water

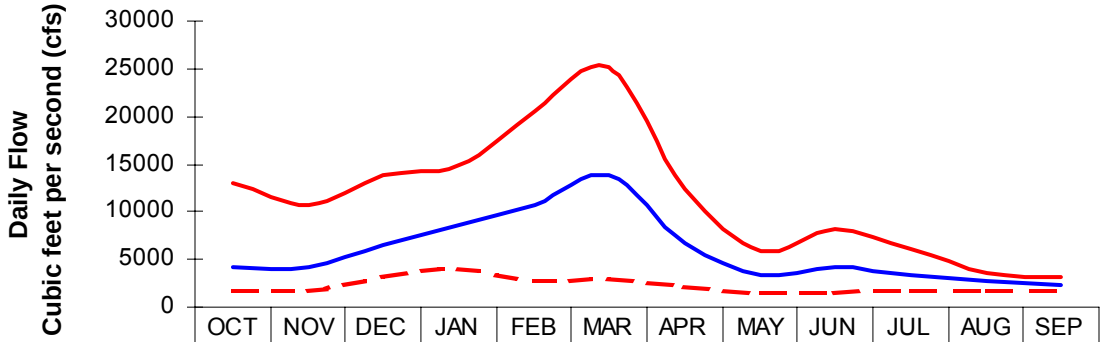
The Tallapoosa River is 258 miles long; 214 miles of it flows from the Alabama-Georgia state line to its confluence with the Coosa River, forming the Alabama River north of Montgomery. The river and its tributaries drain 59 subwatersheds (11-digit HUCs) in Alabama, and its streams flow through 12 counties in Alabama (4 in Georgia).

In-stream flow (or discharge) rates, reservoir storage capacities, and related reservoir management activities largely control the availability of surface waters to meet all beneficial use needs, including maintaining water quality and the integrity of affected ecosystems. Surface water flow (or discharge) is measured as the rate or quantity of water that passes a defined reference point over a defined period of time, usually expressed in cubic feet per second (cfs) or million gallons per day (mgd).

Surface water yield for the basin typically varies seasonally in concert with rainfall levels. Extreme weather events associated with flooding or droughts have resulted in a wide range of flow levels for the basin. For example, the hydrograph in Exhibit 2-9 depicts flow levels observed near Montgomery, Alabama, measuring surface runoff from 99 percent of the Tallapoosa River Basin's drainage area, during the wet and drought periods for water years 1996 through 2002. Across the basin, recorded daily average flows on the Tallapoosa River have ranged from as low as 13 cfs (October 1954) at a USGS gauge in Heflin, Alabama, to as high as 128,000 cfs (February 1961) at the USGS gauge in Tallassee, Alabama.

EXHIBIT 2-9
Tallapoosa River Flow Levels near Montgomery
Tallapoosa River Basin Management Plan

Tallapoosa River Flow Levels Near Montgomery, AL
(USGS Gage 02419890 at River Mile 12.8 for Water Years 1996 - 2002)
Source:USGS Water-Data Report AL-02-1, Water Resources Data Alabama Water Year 2002



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Mean	4114	4267	6584	8504	10600	13760	6638	3370	4147	3292	2674	2403
Maximum	13100	10720	13940	14830	20630	25230	12390	5811	8156	6040	3592	3149
Minimum	1587	1765	3088	3979	2770	2897	2071	1543	1561	1651	1685	1736

Harris and Martin dams are used as hydroelectric peaking facilities on weekdays, primarily during the high-demand summer months. Yates and Thurlow are "run-of-river" facilities used to re-regulate peak releases and to maintain minimum flows on the weekends. Tallapoosa Basin reservoirs account for two-thirds of the water storage capacity for all APCo reservoirs in the ACT River Basin. During the fall and winter period, the pool levels of both Martin and Harris (Lake Wedowee) are lowered an average of 10 feet and 8 feet, respectively, primarily for flood control purposes and to provide flow augmentation to the Alabama River during the dry season in the fall.

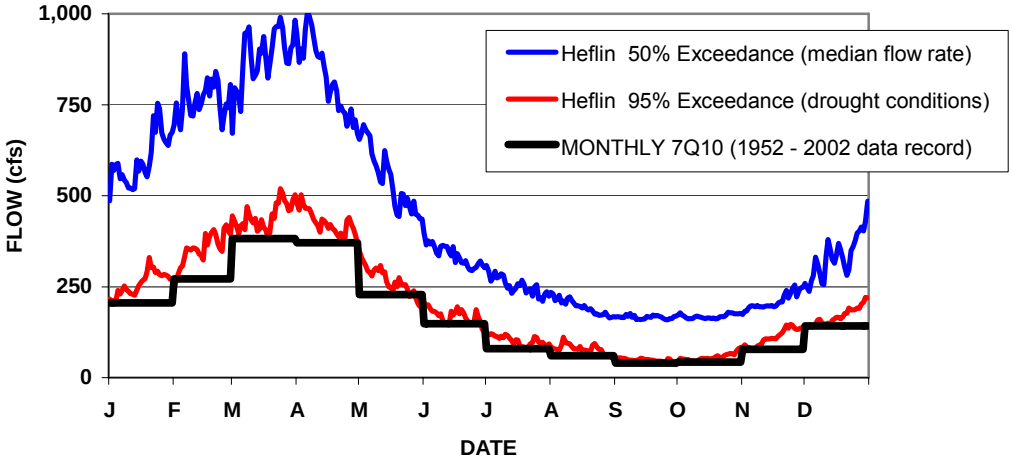
Generally, the greatest concerns regarding the quantity of the basin's surface waters relate to the intensity and duration of extreme weather conditions, as well as water management activities that significantly alter flow levels that otherwise would occur naturally (often referred to as a river or stream's natural flow regime). Recurring severe and prolonged droughts in the basin (such as those during the years 1954 and 1955, 1986 through 1988, and 2000 and 2001) can result in low-flow levels. These low-flow levels stress water use capacities and reduce assimilation capacities for point source and NPS pollutant loads.

Flood events can increase NPS loading, cause sanitary sewer overflows (SSOs), and create channel erosion and extensive siltation in streams, rivers, and reservoirs. Fortunately, most of the river basin is forested and the majority of streams are in good condition, with the exception of some in urban areas or adjacent to industrial land uses (such as mining).

Flow rates for unregulated river and stream segments vary largely due to weather, size of drainage area, geology and geomorphological factors, land cover, and to a lesser extent,

water consumption practices. Such is the case for main-stem river flows in the upper 46 percent (119 miles) of the Tallapoosa River above R. H. Harris Dam (Lake Wedowee) that are unregulated (not influenced by dams). At Heflin, Alabama, the annual mean daily flow from its 448-square-mile drainage area is 667 cfs. However, daily mean flows have varied from a flood-level high of 30,200 cfs (March 31, 1977) to a low of 13 cfs during a severe drought (October 31, 1954). Typically, the river's flow regimes at Heflin, and for the same size unregulated drainage area on the Little Tallapoosa River, have the flow duration characteristics illustrated in Exhibit 2-10.

EXHIBIT 2-10
Surface Flow Duration Levels at Heflin, Alabama (USGS Gauge 02412000)
Tallapoosa River Basin Management Plan



I

range of flow rates measured at Heflin over the period of record and is indicative of what could be called a typical surface flow or discharge rate relative to a given time of year. This curve also illustrates the seasonal flow regime of the river corresponding to the seasonal rainfall pattern.

The 95-percent exceedance curve shows the flow levels that are typical during droughts. This curve shows the flow level that was exceeded 95 percent of the time for the period of record. Also depicted in Exhibit 2-10 is the computed monthly 7Q10 flow, defined as the lowest consecutive 7-day stream flow that occurs within a given month on average once every 10 years. This monthly value is often an important threshold for regulatory policy decisions regarding minimum in-stream flow levels, below which surface water withdrawals for any use usually are prohibited.

Continued growth in demand for surface water upstream in Georgia's portion of the river basin and uncertainty surrounding various proposals for the construction of a regional reservoir close to the state line in Georgia raise concerns over whether resulting in-stream flows would be sufficient to protect the downstream water quality and quantity needs in Alabama. As Exhibit 2-10 suggests, little capacity would remain for Alabama to meet its

various beneficial use needs along the Tallapoosa and Little Tallapoosa rivers in the Upper segment if interstate flow levels were to decline during the dry season or during droughts, in particular.

Flow levels for the main stem of the Tallapoosa River below Lake Wedowee and other reservoirs downstream are regulated by APCo's management activities according to various project requirements prescribed in its operating licenses from the Federal Energy Regulatory Commission (FERC) and cooperative agreements with the COE.

Reservoir operations in the basin both attenuate and augment flow levels in downstream segments depending on the time of year and systemwide needs within the larger ACT River Basin. Downstream flow attenuation is most prevalent during the wet season when reservoirs are in the process of raising pool levels for summer-time hydropower peaking operations. Conversely, dry season and drought periods that result low-flow levels are often augmented by reservoir releases as needed.

Additional information regarding surface water quantity is included in Appendix C.

Groundwater Resources

The Tallapoosa River receives groundwater from aquifers located within the Coastal Plain and Piedmont physiographic provinces of Alabama. Aquifers in the Lower Tallapoosa River Basin are comprised primarily of unconsolidated sedimentary and alluvial deposits of the Coastal Plain province. Aquifers in the Middle and Upper Tallapoosa River basins are comprised primarily of metamorphic and igneous crystalline rocks of the Piedmont province. Wells completed in sedimentary and alluvial aquifers generally are capable of producing more than 500 gallons per minute (gpm), with typical flow rates ranging from 20 gpm to 200 gpm. Groundwater from wells installed in these unconsolidated aquifers is used for public water supply and private domestic use. Wells completed within the igneous and metamorphic crystalline rock aquifers in the Middle and Upper Tallapoosa River basins are typically low-yield wells, with flow rates in the range of 2 to 20 gpm (COE EIS, 1998). Groundwater yields from wells completed in crystalline aquifers are highly variable and dependent on the occurrence of fractures in the saturated portion of the aquifer. These wells generally are limited to private domestic water supply only.

The source of recharge to the aquifers is rainfall, but a large part runs off the land surface to streams during and directly after rain events. Most of the remaining rainfall returns to the atmosphere by evaporation and transpiration; however, a small portion infiltrates to the water table to recharge the aquifers. A large portion of the aquifer recharge is discharged through seeps and springs to provide base flow to the river during extended periods of dry weather.

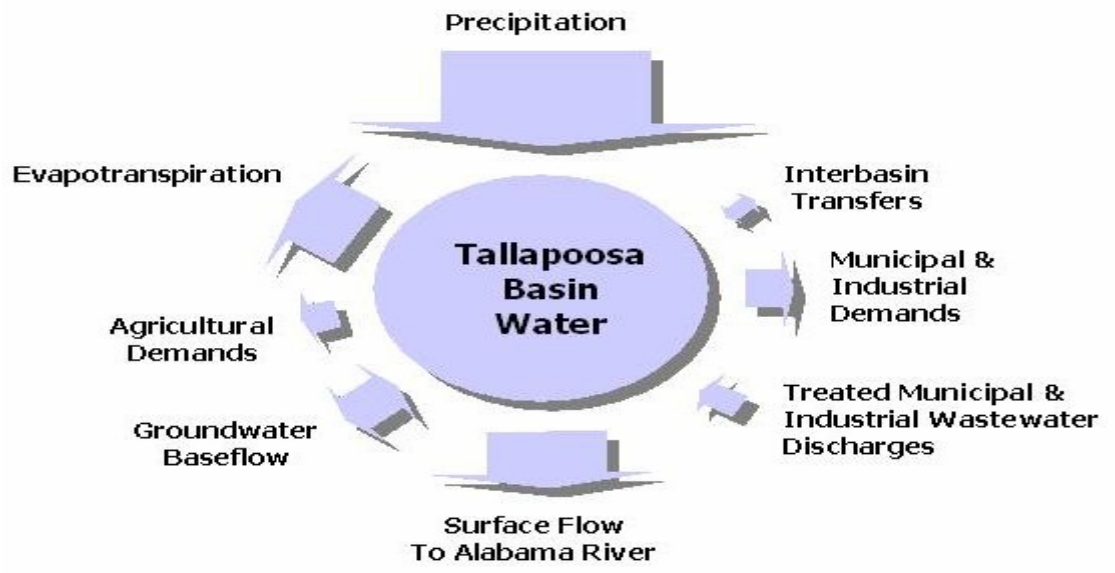
In the Piedmont province, groundwater storage is primarily in the overlying weathered bedrock that forms the porous-media aquifer. Wells located above bedrock are more susceptible to reduced yields during drought conditions, whereas wells located in the bedrock are often capable of sustaining yield during drought conditions. To a lesser degree, the volume of water in storage in the crystalline-rock aquifer is controlled by the degree of fracturing. Because of the limited storage in fractures, water levels in fracture-conduit aquifers typically respond rapidly to pumping.

Overall, groundwater quality in the Coastal Plain and Piedmont aquifers is good for use as drinking water from wells. The more common water quality issues arise periodically from elevated concentrations of iron and manganese associated with these naturally occurring minerals in geologic formations. Elevated concentrations of these minerals are more of an aesthetic problem than a health issue, because they can cause staining of plumbing fixtures and clothes. Shallow groundwater wells completed in these aquifers also can be susceptible to contamination from improperly located and constructed septic tanks at private residences.

Water Use

Riparian water doctrine serves as the legal basis for water use in the eastern United States and is the foundation for the state's water resources management policy as codified in the 1993 Alabama Water Resources Act (Code of Alabama, 1975, Section 9-10B-1 et seq.). Accordingly, the basin's water resources are managed to serve both conjunctive and competing beneficial uses within the basin, as well as demands downstream of the basin. Current uses include water supply for municipal and industrial (M&I), agricultural, hydropower, navigation (downstream flow augmentation for the Alabama River), water quality (such as assimilative capacity for wastewater discharges), flood control, fish and wildlife (F&W) habitat, and recreation. Exhibit 2-11 depicts the relative gains and losses of water to the basin.

EXHIBIT 2-11
Relative Gains and Losses of Water to the Tallapoosa Basin
Tallapoosa River Basin Management Plan



Demands for theses various uses are categorized as consumptive or non-consumptive demands. Water withdrawals that return only a portion or none of a portion of withdrawn water back to the basin are referred to as consumptive uses or "out-of-stream" uses. Examples of consumptive uses are M&I and agricultural water supplies. M&I water demands include all water uses, both publicly supplied and self-supplied, including residential, commercial, governmental/institutional, industrial, manufacturing, and other demands such as unaccounted-for water use (system losses and fire fighting). Under Alabama law, human consumption is recognized as a priority such that "…no limitation upon the use for human consumption shall be imposed except in emergency situations…" (Alabama Water Resources Act, 1993).

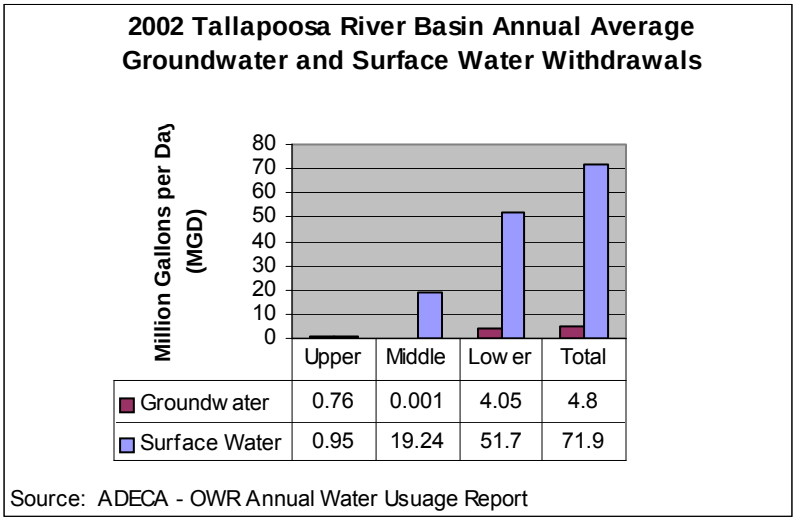
In contrast, non-consumptive uses do not affect the quantity available for other needs, but can affect conjunctive uses, especially when changes are made to the biological, chemical, or physical properties of the water. Most in-stream and in-reservoir uses for recreation, hydropower, navigation, and wastewater assimilation are conjunctive, as well as non-consumptive in nature. Use for one purpose usually does not reduce the capacity to meet other needs. However, during periods of weather extremes, some of the conjunctive needs within the basin take priority, such as for flood control and the need for hydropower during droughts.

Water use generally follows a seasonal pattern. The peak water demand months are June through September, when irrigation and residential water demand peaks with the warm temperatures (Davis et al., 1996). The seasonal demands on surface water affect how decisions are made to manage APCo's dam project operations in the basin. In addition, project operations during drought periods must take water demands into consideration to provide minimum flows to meet water supply and water quality demands.

On the basis of the water usage record for the year 2002, about 94 percent of all water withdrawals within the basin were from surface waters (Exhibit 2-12). Nearly half of the surface withdrawals were from reservoirs, with Lake Martin being the main source. Nearly 77 percent of combined surface water and groundwater withdrawals occurred in the Lower Tallapoosa River segment, primarily to satisfy growing municipal and industrial demands in Elmore and Montgomery counties. The relatively low usage levels in the Upper and Middle Basin segments reflect their predominately rural nature, with the exception of the City of Alexander City, whose water supply facility not only serves the city but also serves the majority of municipal and industrial users throughout Tallapoosa County and portions of Elmore and Coosa counties.

Both surface water and groundwater are used for the purpose of agricultural irrigation. Natural runoff is used extensively for aquaculture purposes. Drinking water supplies for livestock, irrigation of crops and orchards, and aquaculture account for most of the agricultural water demand in the Tallapoosa River Basin. Appendix D provides more water use data.

EXHIBIT 2-12
Tallapoosa Basin Water Withdrawals (2002)
Tallapoosa River Basin Management Plan



Natural Resources

The Tallapoosa River Basin contains a variety of natural resources ranging from specialized plant communities in rock outcrop areas to almost 140 different species of fish.

Aquatic and Riparian Biota

Biota found in the basin include biotic species commonly found in the Alabama and the Southeast, as well as some species unique to the Tallapoosa Basin.

Forests and Grasslands

The Tallapoosa River Basin contains oak-hickory-pine forests. In timbered areas, the dominant canopy species is generally loblolly and short-leaf pine. The subcanopy of the upland forests contains a variety of species that provide a high-quality environment for game animals.

Rock outcrop communities are highly specialized plant communities associated with either granite or limestone outcrops (such as Flat Rock Park in Randolph County). The Tallapoosa Basin contains small areas of both types of outcrops. These plant communities are found in areas that lack sufficient soil to support large shrubs or trees.

Grass-dominated communities typically contain little bluestem. Although occasionally invaded by sweet gum and eastern red cedar, the remnant grass-dominated communities are maintained by periodic droughts and floods that prevent most tree and shrub species from becoming established. Occasional burns, from lightning strikes or other sources, minimize colonization by shrub and tree species in certain areas.

Wetlands

Wetlands are transitional lands between terrestrial and deep-water habitats, in which the water table is at or near land surface or the land is covered by shallow water (U.S. Fish and Wildlife Service [FWS], 1998). Palustrine wetlands include all nontidal wetlands dominated by trees, shrubs, persistent emergents, or emergent mosses or lichens, (freshwater marshes, swamps, bogs, fens, and wet prairies). Most of the wetland area in the Tallapoosa River Basin consists of forested palustrine wetlands located in the floodplains. Bottomland hardwoods are a more common name for riparian or river-associated forested systems. These areas may include small non-forested wetlands such as marsh or shrub wetlands. Riparian systems depend on the natural flooding regime of rivers and, in turn, influence the water and habitat quality of riverine ecosystems. Approximately 7.5 percent (22,387 acres) of the Tallapoosa River Basin contains palustrine wetlands, of which 97 percent (21,702 acres) is riparian wetland and 3 percent (684 acres) is reservoir-associated wetland (FWS, 1998).

Natural and constructed wetlands are efficient at removing a wide variety of pollutants such as suspended solids, nutrients (nitrogen and phosphorus), heavy metals, toxic organic pollutants, and petroleum compounds. Wetlands are also an effective means of reducing peak runoff rates and stabilizing flow to adjacent natural wetlands and streams. They also contribute to the aesthetic value of an area and provide excellent habitat for wildlife and waterfowl in both urban and rural settings.

Fish

The Tallapoosa Basin supports exceptional aquatic biodiversity. The Fall Line between the Piedmont and Coastal Plain regions is a natural barrier to the movement of aquatic species and is one of the most significant physical features affecting the distribution of fish in the basin. Certain fish species only exist above or below the Fall Line (FWS, 1998).

More than 134 fish species have been reported throughout the Tallapoosa River Basin (FWS, 1998). Currently, striped, white, and hybrid bass; paddlefish; black bass; sunfish; catfish; and crappie are found in the basin. The four reservoirs (Harris, Martin, Yates, and Thurlow) in this basin support common sport fish except for hybrid bass, freshwater drum, and southern walleye. Some fish, such as the smallmouth buffalo, are absent from the two upstream impoundments (Martin and Harris reservoirs). In addition, no striped or white bass fisheries occur in the uppermost Harris Reservoir (Freeman et al., 1997; FWS, 1998). Redeye bass are reported to occur in these reservoirs, but generally are restricted to the head of those lakes where flowing water occurs (FWS, 1998).

Mussels, Snails, and Crayfish

Some of the most diverse mussel, snail, and crayfish species can be found in the Tallapoosa River system. Auburn University has documented many of these species (Johnson, 1997; and DeVries, 1997). There are 14 known crayfish species in the Tallapoosa River. Through Auburn's research, it was determined that most snail species were found in the main stem of the river, as well as in the large tributaries. The alteration of the natural flow regime caused by Harris Dam may account for the lack of certain species below the reservoir. The researchers found that Tuskegee National Forest offers some protection of mussel species.

The Tallapoosa River sustains a variety of mussels, although many of them are confined to the lower reaches. The Alabama Department of Conservation and Natural Resources (ADCNR) has identified 30 mussels in the Tallapoosa River. Eight of these are found in and around the Tallassee area.

Threatened and Endangered Species

[NOTE: All photographs in this subsection are taken from Johnson and Wehrle, 2004; www.pfmt.org.]

The wildlife assemblages found in the Tallapoosa River Basin vary greatly, although some species such as white-tail deer, raccoon, Virginia opossum, and grey squirrel are found throughout the basin. Some species are closely tied to the vegetative communities, such as muskrat, which are limited to freshwater emergent marshes. Listed below are the threatened and endangered (T&E) species in the counties of the Tallapoosa Basin. More specific information about T&E species is provided in Sections 4 through 6.

Alabama Canebrake Pitcher Plant (*Sarracenia rubra ssp. alabamensis*)

The FWS Recovery Plan (Allison, 1993) states that the Alabama canebrake pitcher plant is a carnivorous herb typically found in sandy, swampy areas along the fall line of Central Alabama. This plant traps and digests insects in its tubular leaf. The flower blooms from April through June. This plant depends on moist soil conditions. This species is endangered, and Elmore County is the only place in the Tallapoosa Basin where it is found.

Alabama Canebrake Pitcher Plant

Bald Eagle (*Haliaeetus leucocephalus*)

Bald Eagle

Bald eagles are known to catch and eat fish, other prey, and dead animals. These birds tend to nest at the top of large trees that are located adjacent to water bodies. Bald eagles reuse their nests for many years. Alabama bald eagles nest from October through May, sometimes as late as August. Counties in this river basin where bald eagles have been identified are Coosa, Elmore, and Tallapoosa. This species is threatened.

Eastern Indigo Snake (*Drymarchon corais couperi*)

The indigo snake is not poisonous. It is sometimes confused with the black racer or the black pine snake. This snake preys on small mammals, lizards, birds, frogs, toads, and other snakes during the day during most of the year. Indigos tend to be observed near the sandy ridges that

Eastern Indigo Snake

gopher tortoises occupy. The decline of this snake may be attributed to the fact that it is docile and moves slowly. Despite the fact that there are no records of any recent observations of this snake, biologists believe that there may be a few remaining populations in counties such as Bullock and Tallapoosa. This species is threatened.

Fine-lined Pocketbook Mussel (*Lampsilis altilis*)

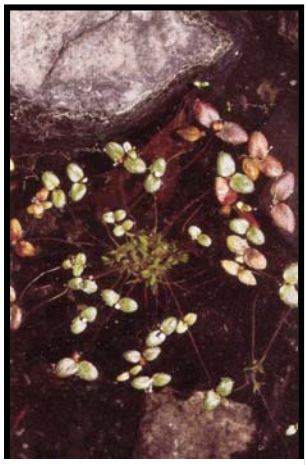
According to the FWS Recovery Plan (Allison, 1993), the fine-lined pocketbook mussel is medium-sized, yellowish-brown to black and white. There are seven counties in the Tallapoosa Basin where this freshwater mussel is found: Clay, Cleburne, Coosa, Elmore, Lee, Macon, and Tallapoosa. Some of the tributaries in Alabama where this mussel is found include Uphapee Creek, Choctafaula Creek, Chewacla Creek, Opintlocco Creek, Cane Creek, Little Cane Creek, and Muscadine Creek. This species is threatened, and according to the FWS Recovery Plan (Allison, 1993), it is unlikely that it will be delisted in the future.

Gopher Tortoise (*Gopherus polyphemus*)

Gopher Tortoise

Gopher tortoises prefer dry, sandy ridges with open stands of longleaf pine, turkey oak, and other scrub oaks. They also frequent open areas around road shoulders, food plots, and rights-of-way that have well-drained, sandy soil. Gophers dig long sloping burrows up to 30 feet long and extending up to 9 feet below the surface. The burrows usually have a characteristic mousehole shape, with a flat bottom and a rounded arched top and sides, much like the gopher itself. These dens are used as shelter by gophers, as well as by a variety of other sandhill residents, including the indigo snake and the diamondback rattlesnake. Gophers feed on grasses and other plant material near the ground. Feeding trails are often visible leading from the den's sandy apron to foraging areas. Eggs are laid in or near the den apron in May, June, and July and hatch in about 80 to 100 days. Gopher tortoises are protected by Alabama state law as a game animal with no open season. This turtle is found in Bullock and Montgomery counties and is a threatened species (http://www.pfmt.org/wildlife/endangered/).

Little Amphianthus (*Amphianthus pusillus*)



Little Amphianthus

The little amphianthus is a small, aquatic annual with blossoming white flowers that generally appear in March or April. This floating plant has submerged leaves less than 1 centimeter long. It has a life cycle of 3 to 4 weeks. In the Tallapoosa Basin, this plant may be found in Randolph and Chambers counties. This is a threatened species (http://www.pfmt.org/wildlife/endangered/; FWS Recovery Plan [Allison, 1993]).

Ovate Clubshell Mussel (*Pleurobema perovatum*)

The ovate clubshell is a small to medium mussel that is yellow to dark brown with white and green on it. Historically, it has been found in the Chewacla Creek, Uphapee Creek, and Opintlocco Creek subwatersheds, which are part of Lee and Macon counties. The ovate clubshell is endangered. According to the FWS Recovery Plan (Allison, 1993), delisting in the near future is unlikely.

Red-cockaded Woodpecker (*Picoides borealis*)

Red-cockaded Woodpecker

The red-cockaded woodpecker resides in living pine trees. These woodpeckers are found living together in small colonies covering 1 to 10 acres. These birds eat the mites, insects, and larvae that live underneath the dead wood in the pine trees. Because they nest in pines that are at least 65 years old, they are not found in many places. This bird is known to occur in Clay, Cleburne, Coosa, Macon, and Tallapoosa counties. This woodpecker is an endangered species.

Relict Trillium (*Trillium reliquum*)

This is a rare, fleshy plant that grows to be less than 12 inches tall. It has waxy dark green blotchy leaves and the spring-blooming flowers grow on top of the leaves and stalk. The relict trillium is seen primarily during the spring. Shady hardwood forest provides the best environment. These plants have been seen in the Lower Tallapoosa watershed in Bullock and Lee counties. This is an endangered species.

Relict Trillium

Southern Clubshell Mussel (*Pleurobema decisum*)

The southern clubshell is a medium-sized mussel with yellow to yellow-brown coloring. This species is found in Lee, and Macon counties–specifically, in the Chewacla Creek and Uphapee Creek subwatersheds. The southern clubshell is an endangered species. The FWS Recovery Plan (Allison, 1993) states that it is not likely that this species will be downgraded to threatened.

Wood Stork

Wood Stork (*Mycteria americana*)

Wood storks are wading birds that feed on small fish in freshwater wetlands. They nest in cypress trees near water bodies and sometimes forage in swamps. They have not been observed recently in Alabama, but could be located in Macon and Montgomery counties. The wood stork is an endangered species.

Critical Habitat

The FWS has designated critical habitat for several species of mussels in the Tallapoosa Basin. Exhibit 2-13 shows the locations of those habitats in the Upper Tallapoosa watershed, while Exhibit 2-14 shows the habitat locations in the Lower Tallapoosa watershed. Exhibit 2-15 lists additional descriptions of the proposed critical habitats for each mussel species.

Sociological Settings

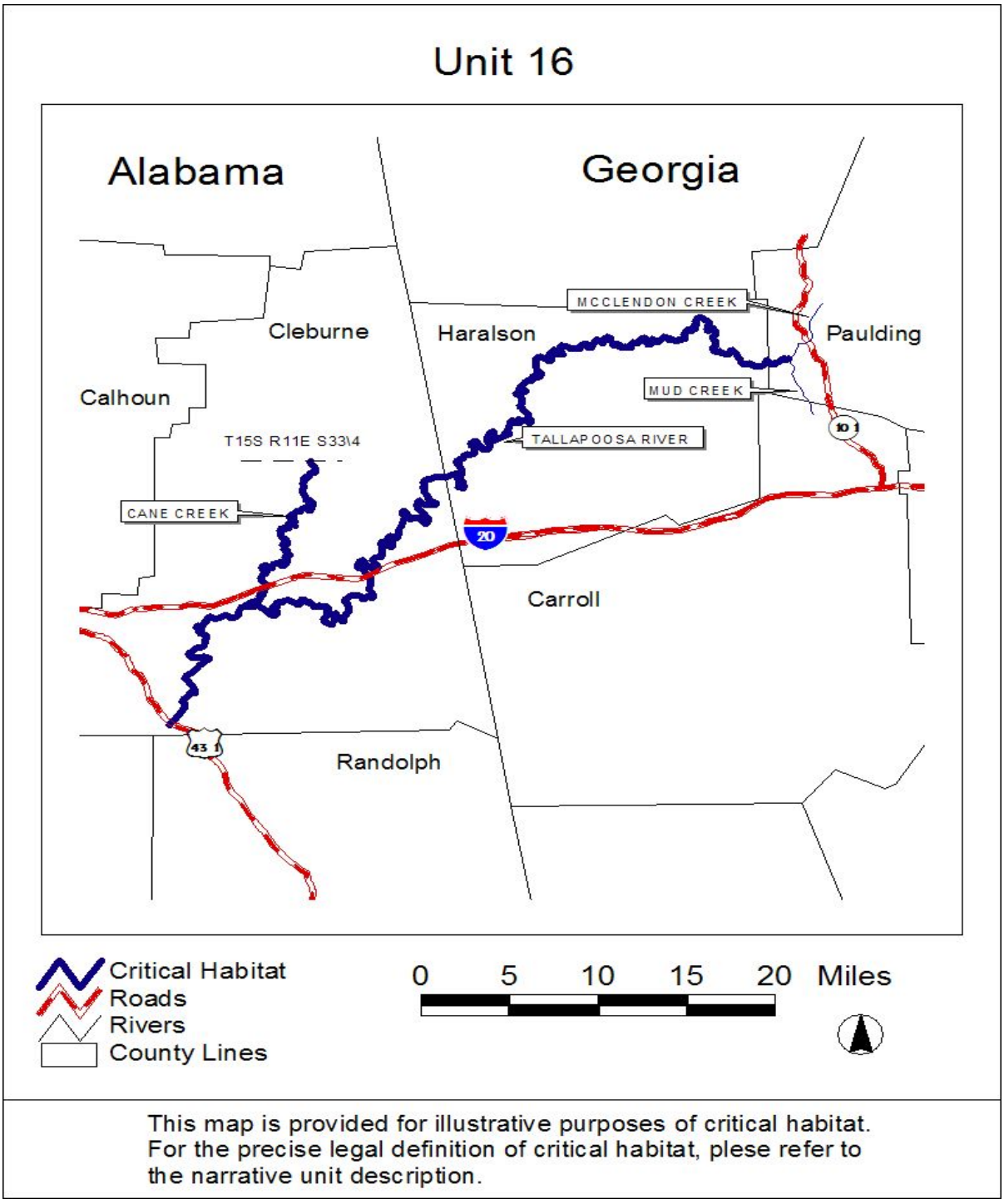
Demographics

The Tallapoosa River Basin encompasses portions of 12 Alabama counties. Although none of the counties falls entirely within the boundaries of the basin, only a small portion of Tallapoosa (the northwestern corner) and Macon (the southeastern corner) counties extends outside the basin. Russell and Coosa counties possess the smallest portion of the basin, with only the northwestern corner of Russell County and the southeastern corner of Coosa County falling within the watershed boundaries. Generally speaking, the Tallapoosa River Basin drains between one third and two thirds of the areas within the remaining eight counties (Exhibit 2-1).

Overall, the Tallapoosa River Basin is characterized by a predominantly rural settlement pattern. According to the 2000 U.S. Census, roughly two thirds or more of the population in 7 of the 12 basin counties live in rural areas. Five of the counties (Clay, Cleburne, Coosa, Randolph, and Tallapoosa) have three quarters or more of their populations residing in rural settings. The populations in Chambers and Macon counties are distributed evenly into rural and urban areas, while only three of the basin's counties (Lee, Montgomery, and Russell) are predominantly urban. In fact, Montgomery County ranks as the second most urban county in Alabama, with roughly 88 percent of its population living in an urban setting. Exhibit 2-16 lists the percentage of urban and rural populations in each of the basin's 12 counties.

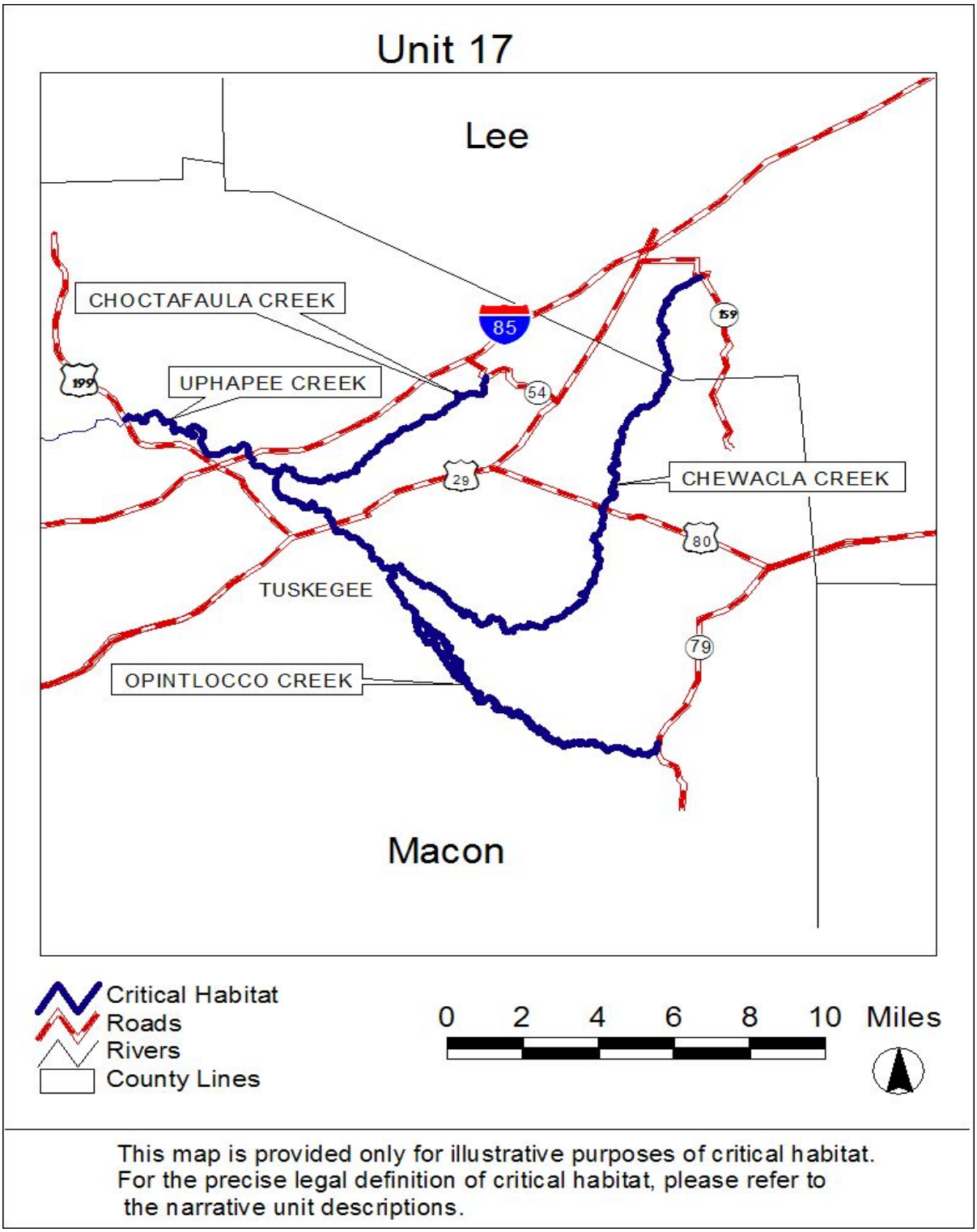
When attempting to deal with environmental issues such as water quality, it is important to consider incidents of poverty. History has shown that some of the worst environmental problems occur in impoverished rural areas. The poor often lack the political clout and enforcement capabilities necessary to prevent environmental impacts and lack the financial resources necessary to correct or remediate past environmental problems. Additionally, ample empirical research studies demonstrate that the environment is not often considered as a priority issue among economically disadvantaged populations. Therefore, it is important to understand incidents of poverty within the Tallapoosa River Basin when developing policies to address water quality issues and needs and to ensure that scarce public resources are directed to the areas of greatest need.

EXHIBIT 2-13
FWS Critical Habitats for Certain Mussel Species in the Upper Tallapoosa Watershed
Tallapoosa River Basin Management Plan



Source: U.S. Fish and Wildlife Service, Daphne Ecological Services Field Office

EXHIBIT 2-14
FWS Critical Habitats for Certain Mussel Species in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan



Source: U.S. Fish and Wildlife Service, Daphne Ecological Services Field Office

EXHIBIT 2-15
Critical Habitat for Mussel Species
Tallapoosa River Basin Management Plan

Species	Critical Habitat
Fine Lined Pocketbook Mussel	Tallapoosa River, Cleburne County, Alabama, and Paulding, and Haralson counties, Georgia; Cane Creek, Cleburne County, Alabama, is a critical habitat unit. It includes the main stem Tallapoosa River from U.S. Highway 431 (T17S R10E S31), Cleburne County, Alabama, upstream to the confluence of McClendon and Mud Creeks (33 °50′ 43″N 85 °00′45″ W), Paulding County, Georgia; and Cane Creek from its confluence with Tallapoosa River (T16S R10E S24), upstream to section 33/4 Line (T15S, R11E), Cleburne County, Alabama. Uphapee, Choctafaula, and Chewacla Creeks, Macon, and Lee counties, Alabama, is a critical habitat unit. It includes the main stem of Uphapee Creek from Alabama Highway 199 (T17N R23E S3), upstream to the confluence of Opintlocco and Chewacla creeks (T17N R24E S26), Macon County, Alabama; Choctafaula Creek, from confluence with Uphapee Creek (T17N R24E S8), upstream to Macon County Road 54 (T18N R 25E S31), Macon County, Alabama; Chewacla Creek, from confluence with Opintlocco Creek (T17N R24E S26), Macon County, Alabama, upstream to Lee County Road 159 (T18N R26E S18), Lee County, Alabama; Opintlocco Creek, from confluence with Chewacla Creek (T17N R24E S26), upstream to Macon County Road 79 (T16N R25E S25) Macon County, Alabama.
Ovate Clubshell Mussel	Uphapee, Choctafaula, and Chewacla Creeks, Macon, and Lee counties, Alabama, is a critical habitat unit. It includes the main stem of Uphapee Creek from Alabama Highway 199 (T17N R23E S3), upstream to the confluence of Opintlocco and Chewacla Creeks (T17N R24E S26), Macon County, Alabama; Choctafaula Creek, from confluence with Uphapee Creek (T17N R24E S8), upstream to Macon County Road 54 (T18N R 25E S31), Macon County, Alabama; Chewacla Creek, from confluence with Opintlocco Creek (T17N R24E S26), Macon County, Alabama, upstream to Lee County Road 159 (T18N R26E S18), Lee County, Alabama; Opintlocco Creek, from confluence with Chewacla Creek (T17N R24E S26), upstream to Macon County Road 79 (T16N R25E S25) Macon County, Alabama.
Southern Clubshell Mussel	Uphapee, Choctafaula, and Chewacla Creeks, Macon, and Lee counties, Alabama, is a critical habitat unit. It includes the main stem of Uphapee Creek from Alabama Highway 199 (T17N R23E S3), upstream to the confluence of Opintlocco and Chewacla Creeks (T17N R24E S26), Macon County, Alabama; Choctafaula Creek, from confluence with Uphapee Creek (T17N R24E S8), upstream to Macon County Road 54 (T18N R 25E S31), Macon County, Alabama; Chewacla Creek, from confluence with Opintlocco Creek (T17N R24E S26), Macon County, Alabama, upstream to Lee County Road 159 (T18N R26E S18), Lee County, Alabama; Opintlocco Creek, from confluence with Chewacla Creek (T17N R24E S26), upstream to Macon County Road 79 (T16N R25E S25) Macon County, Alabama.

Notes:
Source: *Federal Register*, 50 CFR Part 17.

EXHIBIT 2-16
Urban and Rural Population in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

County	Total Population	Urban	Percent Urban	Rural	Percent Rural
Montgomery County	223,510	196,892	88	26,618	12
Lee County	115,092	77,197	67	37,895	33
Russell County	49,756	31,895	64	17,861	36
Chambers County	36,583	18,374	50	18,209	50
Macon County	24,105	12,005	50	12,100	50
Elmore County	65,874	25,069	38	40,805	62
Bullock County	11,714	4,139	35	7,575	65
Tallapoosa County	41,475	10,265	25	31,210	75
Randolph County	22,380	4,873	22	17,507	78
Coosa County	12,202	317	3	11,885	97
Clay County	14,254	0	0	14,254	100
Cleburne County	14,123	0	0	14,123	100

Notes:
Source: U.S. Department of Commerce, Bureau of the Census, 2000 Census.

The available data from the 2000 Census (for the year 1999) indicate that significant areas of poverty exist in the Tallapoosa River Basin. These data are listed in Exhibit 2-17, and include three general measures of poverty. Data for each county in the Tallapoosa River Basin are compared with the state averages in each measure to highlight problem areas. Individual county statistics that indicate levels of poverty exceeding the state average are italicized in Exhibit 2-17.

EXHIBIT 2-17
Measures of Poverty in the Tallapoosa River Basin (1999)
Tallapoosa River Basin Management Plan

County/State	Percent of Population with Incomes Below Poverty Level	Percent of Households Receiving Public Assistance	Percent of Families with Incomes under 150% of Poverty Level
Alabama	16.1	2.2	27.1
Bullock	***33.4***	***3.2***	***49.3***
Chambers	***17.0***	***2.7***	***30.8***
Clay	***17.1***	***2.7***	***31.6***
Cleburne	13.9	2.0	***29.4***
Coosa	14.9	***2.4***	***30.2***
Elmore	10.2	1.3	18.5
Lee	***21.8***	1.5	***35.3***
Macon	***32.8***	***3.3***	***45.4***
Montgomery	***17.3***	***2.4***	24.8
Randolph	***17.0***	***2.4***	***31.8***
Russell	***19.9***	***3.6***	***34.0***
Tallapoosa	***16.6***	2.1	***29.4***

Notes:
Source: U.S. Census Bureau, 2000 Census.

More information regarding demographics in the Tallapoosa River Basin is included in Appendix E.

Economy

The structure of the local economy is another important factor to consider in environmental planning. The structure of the local economy not only indicates potential sources and types of water resource contamination that may exist within the basin, but also identifies potential sources of funding that may be available to local residents to address potential water quality issues in the area. Detailed economic data for the counties in the Tallapoosa River Basin are limited because of the small population base in most of the counties. Data for this plan were drawn from the 2001 County Business Patterns report produced by the U.S. Census Bureau.

Data contained in the County Business Patterns report have some basic limitations. First, the survey data used to compile the County Business Patterns report are obtained only from those business establishments whose employees are covered by unemployment insurance. Many small business operations (such as farms, home occupations, and personal service businesses) do not provide unemployment insurance coverage for their employees, and may be underrepresented or missing from the survey data. Second, the County Business Patterns report suppresses data for some business sectors when the sample size is small or one business enterprise dominates the sector. In such instances, the data are suppressed to maintain the confidentiality of specific business establishments within each sector. For the purposes of this study, the analysis of economic activity conducted for this plan was limited to four major economic sectors–1) agriculture, forestry, and fishing; 2) manufacturing; 3) retail trade; and 4) public services. These four sectors were considered especially relevant to this plan for several reasons. Much of the land in the Tallapoosa River Basin is dedicated to agriculture and forestry uses, and these activities are a major potential source of storm water runoff, which may include sediment and nutrients. The manufacturing sector is a major historic employer in the Tallapoosa River Basin, and still represents a key source of direct discharges to surface waters in the area. Retail trade is the fastest-growing sector of the local and national economy. It also represents an important source of urban and suburban sprawl on the landscape, which contributes to storm water runoff contamination from impervious surfaces. Finally, the public service sector provides a relative indication of the size of the government within the local economy. The remaining sectors of the local economy tend to be somewhat smaller by comparison and subject to more frequent data suppression.

Exhibits 2-18, 2-19, and 2-20 list the data obtained from the 2001 County Business Patterns report for all 12 Tallapoosa River Basin counties. Exhibit 2-18 indicates the number of business establishments in the four major economic sectors. Exhibit 2-19 provides employment data within each sector, while Exhibit 2-20 shows the total annual payrolls paid by businesses in each economic sector.

EXHIBIT 2-18
Number of Business Establishments in Major Economic Sectors (2001)
Tallapoosa River Basin Management Plan

County	Agriculture, Forestry, Fishing	Manufacturing	Retail Trade	Public Services
Bullock	7	6	33	17
Chambers	25	37	130	75
Clay	19	16	48	23
Cleburne	13	12	48	12
Coosa	12	9	32	10
Elmore	13	47	205	88
Lee	11	100	398	217
Macon	2	5	64	29
Montgomery	15	217	1,090	701
Randolph	15	26	85	49
Russell	8	37	171	63
Tallapoosa	21	54	177	95
Totals	**161**	**566**	**2,481**	**1379**

Notes:
Source: U.S. Department of Commerce, County Business Patterns (2000-2001).

EXHIBIT 2-19
Number of Employees in Major Economic Sectors (2001)
Tallapoosa River Basin Management Plan

County	Agriculture, Forestry, Fishing	Manufacturing	Retail Trade	Public Services
Bullock	79	N/A	266	312+
Chambers	167	4,653	1,474	1,232+
Clay	133	2,509	433	602+
Cleburne	44	1,031	250	184+
Coosa	68	803	117	N/A
Elmore	93	2,220	1,971	1,057+
Lee	103	6,217	5,205	5,079
Macon	N/A	N/A	417	2,102+

EXHIBIT 2-19
Number of Employees in Major Economic Sectors (2001)
Tallapoosa River Basin Management Plan

County	Agriculture, Forestry, Fishing	Manufacturing	Retail Trade	Public Services
Montgomery	N/A	11,125	15,513	16,774
Randolph	N/A	2,202	767	678
Russell	N/A	2,250	1,883	1,141
Tallapoosa	89	3,818	1,702	2,150+

Notes:
N/A = Data suppressed to avoid disclosing information about one firm due to small number of firms in sample or large size of one firm relative to others in sector.
+ - Only partial data available for sector.
Source: U.S. Department of Commerce, County Business Patterns (2000-2001).

EXHIBIT 2-20
Annual Payroll in Major Economic Sectors (2001)
Tallapoosa River Basin Management Plan

County	Agriculture, Forestry, Fishing	Manufacturing	Retail Trade	Public Services
Bullock	$1,803	N/A	$4,350	$6,441+
Chambers	$4,162	$140,511	$25,018	$31,664+
Clay	$2,542	$53,328	$5,925	$12,059+
Cleburne	$1,022	$21,352	$5,153	$3,242+
Coosa	$1,443	$22,014	$1,803	N/A
Elmore	$4,322	$57,729	$33,184	$20,032+
Lee	$1,314	$197,570	$84,472	$135,250
Macon	N/A	N/A	$6,431	$86,580+
Montgomery	N/A	$366,344	$293,544	$505,381
Randolph	N/A	$39,912	$11,486	$14,197
Russell	N/A	$98,079	$31,978	$25,488
Tallapoosa	$1,877	$106,279	$28,118	$49,693+

Notes: All figures rounded to nearest $1,000.
N/A = Data suppressed to avoid disclosing information about one firm due to small number of firms in sample or large size of one firm relative to others in sector.
+ - Only partial data available for sector.
Source: U.S. Department of Commerce, County Business Patterns (2000-2001).

According to the data in Exhibit 2-18, the retail trade and public service sectors have the largest numbers of establishments in the basin. Of course, it is important to remember that manufacturing firms tend to be much larger than establishments in the other sectors.

The relatively small number of establishments in the agriculture and forestry sector reflects the overall decline that has occurred in the traditional agricultural base of the rural counties in the Tallapoosa River Basin. Overall, the number of farm operations in the basin has declined significantly over the past 50 years, while the scale of operation of the remaining farms has increased. An increasing number of the remaining farm operations are large commercial operations, rather than small family-owned and operated farms. In addition, much of the agricultural land farmed in past years has been converted to forestland. However, the number of forest business establishments in any one county is not a reliable indicator of forestry activity within the county. A small number of timber harvesting businesses can serve the forest management and timber harvesting needs of many woodlots across the basin. Consequently, as more farmland is converted to forestland, the number of businesses in that sector will continue to decline. Despite the declines that have occurred in the agriculture and forestry sector of the basin's economy, most of the land area within the Tallapoosa River Basin is devoted to these uses.

Current employment patterns in the Tallapoosa River Basin are listed in Exhibit 2-19. The data in Exhibit 2-19 show the economic influence of the manufacturing sector on the basin's economy. Although the number of retail trade firms in the basin (as indicated in Exhibit 2-18) is nearly five times the number of manufacturing plants, the manufacturing sector employs as many or more workers than are employed in the retail trade sector in those counties for which employment data were not suppressed. Only Montgomery County had fewer manufacturing sector workers than retail trade employees. This statistical inconsistency may be attributed to the city's role as a commercial center for a much larger area.

Employment data in the public services sector of the economy is limited. In most counties, data in one or more subcomponents of the sector were suppressed, resulting in only partial employment totals. Nevertheless, the data show that the government sector is a major employer in all counties within the basin.

Another measure of economic activity within the basin is annual payroll data. This information is provided in Exhibit 2-20. These data clearly show the overwhelming influence of the manufacturing sector on the basin's economy. In almost every county for which data were available, the manufacturing sector had the largest total payroll of any other economic sector. Only Montgomery County, which contains the state's capital city, had a larger total payroll in another sector. In many counties, the total manufacturing payroll was more than four times the total payroll of other sectors.

Clearly, the manufacturing sector still dominates the economies of most counties in the Tallapoosa River Basin, while most of the land area is dedicated to agricultural and forestry uses. Therein lies the basic economic problem that the basin's counties face. Both of these sectors have experienced significant economic declines over the past 30 to 50 years. The manufacturing sector, traditionally dominated by the textile industry, has experienced significant job losses in recent years. In fact, one of the basin's largest remaining textile industries, Russell Corporation, relocated its corporate headquarters from Alexander City to

Atlanta, Georgia, in the late 1990s as part of its bankruptcy reorganization plan. Since then, it has gradually closed a number of its satellite textile plants in Chambers, Tallapoosa, and Clay counties. These losses, combined with the ongoing economic transition in the agriculture and forestry industries, have strained the rural economies within the basin and left many of the basin's counties with only limited financial resources to address a growing number of local economic needs. In 2002, Hyundai began construction of an automotive assembly plant in Montgomery County, and to make up for recent losses in the manufacturing sector, surrounding counties actively began recruitment efforts to lure suppliers for the assembly plant. Although some counties within the basin have had success in recruiting spin-off industries, the effects on local economies may not be observable for several years. As the cities and counties in the basin struggle to expand and diversify their local economies, they will have fewer financial resources to use in addressing critical environmental issues.

Land Cover and Land Use

Any meaningful attempt to protect water quality requires a basic understanding of land use and land development patterns within the watershed. The intensity and character of land development within a watershed affect both the quality and volume of storm water runoff. For the purposes of this plan, the intensity of land development will be evaluated by land cover data.

Land cover data provide a basic measure of how man's activities have altered the surface of the earth. Land cover classifications range from generally natural or unaltered surface conditions such as forest/woodland, bare rock/clay, open water, and wetlands, to urbanized land cover classifications such as high-density residential and commercial. Forest/woodland areas can be altered by man through timber harvesting, but such activities tend to be sporadic and the effects are temporary. Transitional lands include lands that are in the process of reverting to a natural state from an abandoned activity such as agriculture, mining, or some other natural resource use. The lowest intensity of altered lands includes agricultural and mining areas. However, they can contribute to water contamination through the application of pesticides, fertilizers, and animal waste in addition to erosion and sedimentation of disturbed or cultivated soils.

The highest level of alteration occurs in lands characterized by urban land cover, which includes all urban development activities. These lands typically are covered by extensive man-made impervious surfaces, such as roads, buildings, sidewalks, parking lots, and other developed features. These surfaces reduce the amount of rainfall that can soak into the ground and increase the volume and intensity of storm water runoff. Contaminants that collect on these impervious surfaces are carried away by storm water runoff as it drains into streams, rivers, and lakes, thereby causing surface water pollution.

Land use and land cover data provide a more detailed picture of the character of land development in an area. Land use refers to the manner in which man actively uses the land. For example, the urban land cover category may encompass a wide range of land uses such as residential, commercial, industrial, recreational, roads, and the like. Each different land use classification can represent a different level or kind of impact on water quality. For example, industrial land uses can result in direct discharges of processed water, while

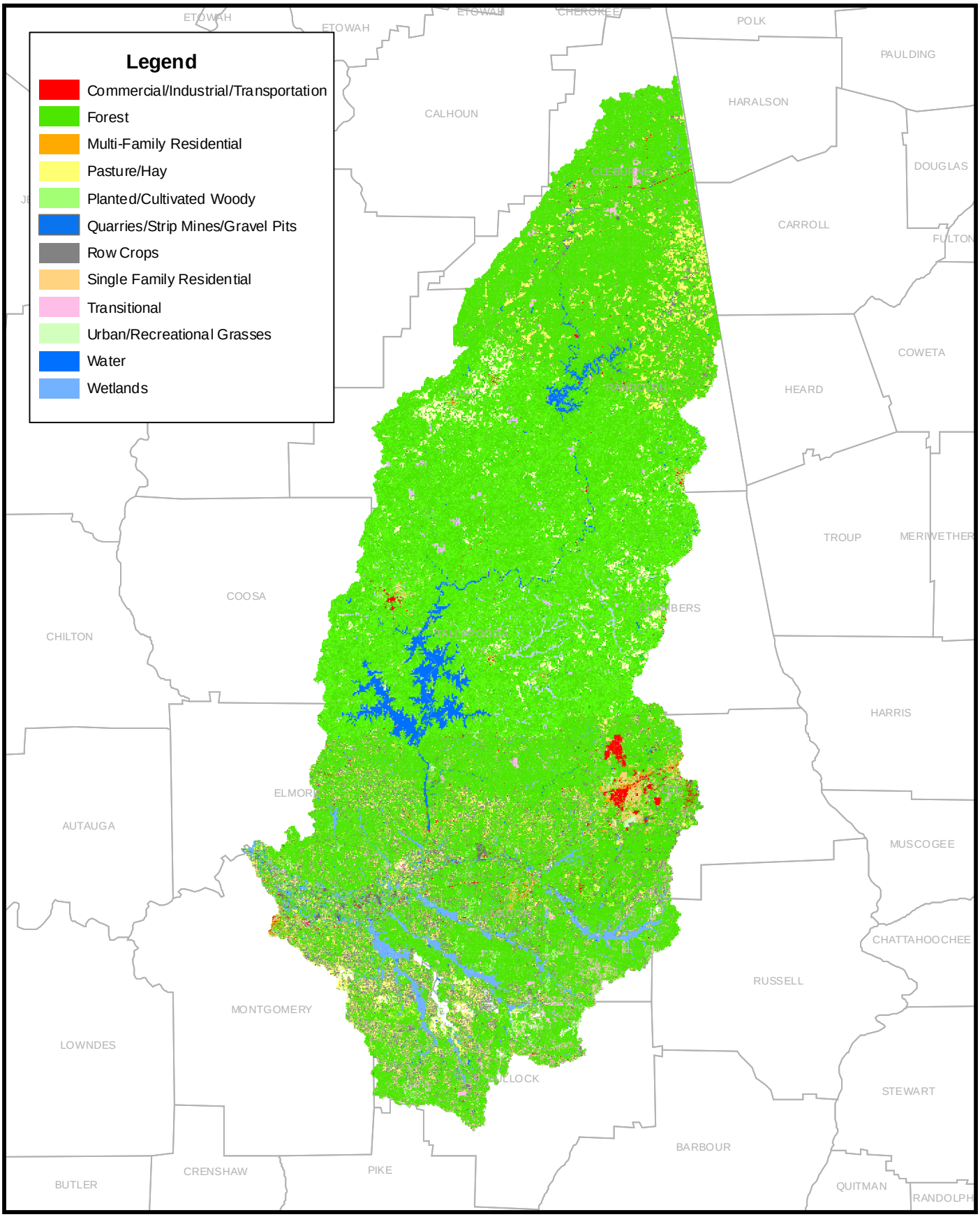
residential uses may contribute waste from failing septic systems, as well as lawn fertilizers and pesticides. The level of storm water runoff from impervious surfaces also varies between different land uses, with commercial development generating the highest average levels (especially in downtown areas). The greater the concentration of impervious surfaces within a certain area, the greater the potential for erosion and sedimentation of surface water resources.

Land cover data for this plan were obtained from EPA's National Land Cover Data (NLCD) database. These data are interpreted from satellite imagery and are available for the entire Tallapoosa River Basin. For analysis purposes, the land cover data were divided into the three HUCs for the Upper, Middle, and Lower Tallapoosa River sections (03150108, 03150109, and 03150110) that comprise the Alabama portion of the river basin. Exhibit 2-21 displays the land cover for the 11-digit HUC subwatersheds in the basin.

Unfortunately, more detailed land use data generally are not available throughout the basin. These data usually are compiled through field reconnaissance or surveys as part of a special planning study or project. Because the Tallapoosa River Basin contains few large cities, such planning studies are in short supply. The only recent land use survey data compiled within the Tallapoosa River Basin cover the areas in Cleburne County along I-20 and the City of Heflin, the areas surrounding Lake Wedowee (including the Town of Wedowee), and the cities of Tuskegee, Franklin, Shorter, Auburn, and Opelika in the Lower Tallapoosa River watershed. No land use information currently is available in the Middle Tallapoosa River watershed. Consequently, it is difficult (if not impossible) to accurately characterize land use patterns in the most rural portions of the river basin.

Land cover data for each major watershed in the Tallapoosa River Basin are provided in Exhibits 2-22, 2-23, and 2-24. According to the data in these exhibits, the vast majority of the land in the Tallapoosa River Basin is forested. Forested lands cover roughly 84 percent of all land in the Upper and Middle Tallapoosa River watersheds, and 64 percent of the Lower Tallapoosa River watershed. The lower percentage of forestland cover in the Lower Tallapoosa River watershed is counterbalanced by slightly higher percentages of agricultural lands, open water and wetlands, and urbanized (developed) lands. This pattern reflects the general trend toward more open, level, and arable lands in the southern reaches of the basin. Higher levels of urban development are to be expected in the Lower Tallapoosa River watershed, given the greater concentration of larger cities and towns in that watershed. Land in the Upper and Middle Tallapoosa River watersheds tends to be hillier and less accessible to major highways, resulting in a more rural land cover pattern with lower overall population densities. Overall, urban uses consume 3 percent of all land in the Lower Tallapoosa River watershed, as opposed to only 1.1 percent in the Middle Tallapoosa River watershed and a mere 0.6 percent in the Upper Tallapoosa River watershed. Nevertheless, storm water runoff from urbanized areas in the basin represents one of the most significant and rapidly expanding surface water quality threats in the Tallapoosa River Basin.

Insert Exhibit 2-21



EXIBIT 2-21
Tallapoosa Land Cover Map
Tallapoosa River Basin Management Plan

CH2MHILL

EXHIBIT 2-22
Upper Tallapoosa River Watershed Land Cover
Tallapoosa River Basin Management Plan

Land Cover Category	Acreage	% of Total	Urban Uses	% of Total
Transitional	5,871.3	1.2		
Forest/Woodland	399,387.4	83.8		
Wetlands	593.1	0.1		
Open Water	5,373.9	1.1		
Agricultural	62,637.9	13.1		
Quarries/Mining	68.4	0.0		
Residential	743.5	0.2	743.5	28.2
Urban Nonresidential	1,144.5	0.2	1,144.5	43.4
Urban Greenspace	748.2	0.2	748.2	28.4
Total All Land Cover Categories	476,568.3	100.0	2,636.2	100

Notes:
Source: EPA Multi-Resolution Land Characterization (MRLC) data as compiled by CH2M HILL. Additional analysis by the EARPDC.

EXHIBIT 2-23
Middle Tallapoosa River Watershed Land Cover
Tallapoosa River Basin Management Plan

Land Cover Category	Acreage	% of Total	Urban Uses	% of Total
Transitional	8,422.6	0.8		
Forest/Woodland	858,340.7	84.4		
Wetlands	12,076.1	1.2		
Open Water	43,369.3	4.3		
Agricultural	84,957.4	8.4		
Quarries/Mining	146.3	0.0		
Residential	4,611.6	0.5	4,611.6	45.8
Urban Nonresidential	2,875.2	0.3	2,875.2	28.6
Urban Greenspace	2,574.5	0.3	2,574.5	25.6
Bare Rock/Sand/Clay	4.7	0.0		
Total All Land Cover Categories	1,017,378.3	100.0	10,061.3	100

Notes:
Source: EPA Multi-Resolution Land Characterization (MRLC) data as compiled by CH2M HILL. Additional analysis by the EARPDC.

EXHIBIT 2-24
Lower Tallapoosa River Watershed Land Cover
Tallapoosa River Basin Management Plan

Land Use Category	Acreage	% of Total	Urban Uses	% of Total
Agriculture	212,414.7	19.6		
Quarries/Mining	1,187.7	0.1		
Forest/Woodlands	696,652.8	64.1		
Surface Water/Open Swamps	91,721.8	8.4		
Residential	15,661.1	1.4	15,661.1	47.5
Urban Nonresidential	12,824.0	1.2	12,824.0	38.9
Urban Greenspaces/Recreation/Etc.	4,481.6	0.4	4,481.6	13.6
Transitional/Bare Land	17,197.3	1.6		
Unknown	33,980.4	3.1		
Total All Land Uses	1,086,121.5	100.0	32,966.7	100

Notes:
Source: EPA Multi-Resolution Land Characterization (MRLC) data as compiled by CH2M HILL. Additional analysis by the EARPDC.

A closer assessment of urbanized lands in the basin shows that the nearly half of all urban lands are developed for residential use (houses, driveways, swimming pools, and associated accessory structures). Residential uses comprise between 43 and 48 percent of all lands developed for urban uses in all Middle and Lower Tallapoosa River watersheds and 28 percent of all lands in the more rural Upper Tallapoosa River watershed. In fact, the percentage of urban lands dedicated to residential uses throughout the basin may be considerably greater than 50 percent, because a significant portion of the urban greenspace category consists of residential lawns. Although the lands dedicated to urban nonresidential uses (industrial, commercial, institutional, etc.) in the basin are somewhat less than those dedicated to residential uses (except in the Upper Tallapoosa River watershed), the potential effects on overall water quality are even greater. The nonresidential land uses tend to have higher concentrations of impervious surfaces and also frequently involve the use of materials and chemicals that pose a greater threat to water quality.

Of the non-urban land cover categories, agricultural lands pose the greatest potential range of water quality concerns from fertilizer and pesticide application, to domestic animal waste, to erosion and sedimentation from cultivated lands. Between 8 and 20 percent of the land in each watershed is dedicated to agricultural uses. However, historic trends over the past 50 years have shown a steady decline in the amount of land dedicated to agricultural uses. Many former agricultural lands have been converted to urban uses (especially rural residential uses) and forest lands. Also, small farm operators need greater financial assistance to implement BMPs to address water quality effects.

3. Regulatory Considerations

3. Regulatory Considerations

Introduction

Although several of the measures to manage and protect water resources can be implemented on a voluntary basis, there are numerous regulatory programs in place to ensure that water quality, water quantity, and aquatic ecosystems are protected. Regulations provide mechanisms for federal and state agencies to compel those who have the potential to have a significant negative effect on water resources and aquatic life to follow specific rules and to meet specific standards. For example, through the Clean Water Act (CWA), regulatory agencies can define and limit the amount and type of some pollutants in wastewater discharges. This section provides an overview of Alabama's water-related regulations and regulatory agencies as they relate to river basin management.

Clean Water Act (1972 Federal Water Pollution Control Act Amendments)

The Federal Water Pollution Control Act Amendments of 1972, as amended in 1977, are commonly known as the CWA. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA provides provisions for regulating pollutant discharges into the waters of the United States, and it gives EPA and the states the authority to develop and implement programs to reduce surface water pollution. Although the CWA does affirm state authority to allocate quantities of water within state jurisdictions, it does not directly address issues related to water quantity. The states maintain most of the authority for CWA implementation, but if EPA disagrees with state decisions, in many cases, it can override these decisions.

ADEM is the state agency that has the authority to develop and implement surface water protection programs in Alabama. The CWA addresses issues related to surface water quality. However, some provisions designed for the protection of surface water quality also can protect groundwater quality.

Specific provisions of the CWA must be considered when planning for the protection of water bodies. Section 3 provides a list and general description of each of these CWA provisions, as well as other state programs designed to protect water quality.

Water Quality Standards

Water quality standards (WQS) are comprised of: 1) designated uses or use classifications; 2) water quality criteria; and 3) an antidegradation policy. WQS aim to be quantifiable, and they are set for all bodies of surface water that are defined as waters of the United States. These include rivers, lakes, estuaries, wetlands, streams, and coastal waters. In Alabama, ADEM adopts WQS, which must be approved by EPA. WQS must be consistent with the

goals of the CWA, and when WQS are established, the public must be given at least two opportunities to provide input or public comments during the approval process.

After WQS are established, water bodies should be monitored to evaluate whether water bodies are meeting the quantifiable or numeric criteria associated with their associated WQS. In addition to other monitoring, ADEM monitors each basin on a 5-year rotational basis. The Tallapoosa River was last monitored in 2000 and will be monitored again in 2005. Because of limited resources, ADEM is not capable of monitoring all of the surface bodies of water in the state on an annual basis. Other monitoring programs, such as AWW, provide additional data for ADEM's use in screening for water quality problems. However, even with these programs, many of Alabama's water bodies are not consistently monitored.

Use Classifications

The designated uses of a water body, which ADEM refers to as use classifications, are the uses that the water body should attain as determined by ADEM and approved by EPA. Use classifications are assigned to each water body, and some water bodies can have multiple classifications. Additionally, based on use attainability and actual use, classifications can vary from one segment of a water body to another. These uses are reviewed periodically and updated. Efforts to solicit public participation, including public meetings and comment periods, are incorporated into the update process. Each use classification has associated water quality criteria (WQC), and the goal is for the water body to attain the criteria for its designated use.

ADEM uses the following use classifications for Alabama's surface waters:

1. Outstanding Alabama Water (OAW)
2. Public Water Supply (PWS)
3. Swimming and Other Whole Body Water-Contact Sports (S)
4. Shellfish Harvesting for Coastal Waters only (SH)
5. Fish and Wildlife (F&W)
6. Limited Warm Water Fishery (LWF)
7. Agricultural and Industrial Water Supply (A&I)

ADEM assigns use classifications based on existing uses of a water body, expected future uses, and uses that a water body can attain if pollution that could be corrected is controlled. Ideally, the use classification of a water body should answer the question, "For what purpose(s) is this water body used?" However, in some cases, individuals may use water bodies for purposes other than their designated uses, and because of natural conditions, some of these water bodies may not physically be able to meet the WQC for that purpose.

Appendix F lists the water use classifications in the Tallapoosa River Basin.

ADEM may review or change the use classification for a water body as the need arises. A formal review of all of the state's classifications occurs every 3 years. An existing use classification for a water body cannot be removed, but can be upgraded or downgraded. This change can be accomplished through a process known as reclassification; a use attainability analysis (UAA) is used to determine new classifications.

Water Quality Criteria

As noted, each use classification has associated WQC. These are indicative of the conditions in a water body that need to exist to sustain a use classification. WQC can be expressed numerically as concentrations of pollutants, or they can be expressed in narrative terms. However expressed, WQC provide a description of what levels of individual pollutants or characteristics need to exist to meet a water body's assigned use classification. WQC can be applied to certain segments of the aquatic system and over various time durations. For example, different criteria may be used during the warm months (or growing season) than during cooler months. Although ADEM can consider economic and social factors when determining a use classification, these factors cannot be considered when establishing WQC to protect a designated use. Only scientific considerations can be used when establishing WQC. The CWA provisions for establishing WQC are broad, and for some water bodies or parts of water bodies, states may elect to establish site-specific criteria that are suited for environmental conditions at that particular site. Site-specific criteria may be narrative or numeric.

Appendix G includes the general WQC associated with each of Alabama's use classifications.

Nutrient Criteria

ADEM has established water body-specific criteria to enhance nutrient management for the reservoirs in the Tallapoosa River Basin. The purpose of the lake nutrient criteria is to maintain existing identified uses. Nutrient criteria in the Tallapoosa River Basin are expressed using chlorophyll *a*, a measure of the amount of algae (phytoplankton) content in water, and for monitoring purposes, the mean of the photic-zone composite chlorophyll *a* samples collected monthly from April through October may not exceed the established limits. ADEM acknowledges that there is some degree of uncertainty in understanding the relationship between nutrient input and lake chlorophyll *a* level. Therefore, ADEM may elect to change the criteria as additional data become available in the future. Exhibit 3-1 lists the current nutrient criteria that have been set for the Tallapoosa River.

Antidegradation

Antidegradation policies are designed to protect the level of water quality needed to maintain the existing uses of waters and to maintain clean water. ADEM's antidegradation policy stipulates that in water bodies where the quality exceeds the level necessary to support wildlife, recreation, fish, and other aquatic life, the existing quality will be protected and maintained. Antidegradation does not prohibit new pollution discharges. If water quality levels sufficient to maintain existing uses can be maintained, new discharges that are important for economic or social development may be allowed after appropriate permitting procedures are followed.

EXHIBIT 3-1
Nutrient Criteria for Tallapoosa River Reservoirs
Tallapoosa River Basin Management Plan

Reservoir	Chlorophyll *a* Limit(s)	Sample Location(s)
Thurlow	– 5 µg/L	– Deepest point, main river channel, dam forebay
Yates	– 5 µg/L	– Deepest point, main river channel, dam forebay
Martin	– 5 µg/L	– Deepest point, main river channel, dam forebay, or – Deepest point main river channel, immediately upstream of Blue Creek embayment, or – Deepest point, main creek channel, immediately upstream of Alabama Highway 63 (Kowaliga) bridge
R. L. Harris	– 10 µg/L – 12 µg/L	– Deepest point, main river channel, dam forebay, or – Deepest point, main river channel, immediately upstream of the Tallapoosa River - Little Tallapoosa River confluence

Notes:
µg/L = micrograms per liter
Source: ADEM, Water Division–Water Quality Program, Chapter 335-6-10, Water Quality Criteria.

National Pollutant Discharge Elimination System Program

The National Pollutant Discharge Elimination System (NPDES) regulatory program was created by Section 402 of the CWA. The CWA authorized states to administer their own permit programs as long as they are comparable to the national program. In Alabama, the NPDES program is administered by ADEM, and the Alabama Water Pollution Control Act (AWPCA) gives ADEM the authority to permit the discharge of wastewater entering a water of the state. According to the CWA and state regulations, any person or entity that intends to discharge pollutants into surface water must obtain a NPDES permit from ADEM before any discharge begins. NPDES permits set numeric limits on the levels of certain pollutants that can be discharged and specify when discharges can take place.

NPDES permits may be issued in two ways. One way is to issue single permits for each discharger. These are referred to as individual permits. The second way is to issue a single permit for a group of similar discharges. These are referred to as general permits. General permits can have constraints on the geographical area of coverage and type of source.

Regardless of the type of permit, NPDES permits are issued for dischargers that meet certain thresholds. These include industrial and municipal point source discharges, discharges from storm sewer systems in larger cities, storm water associated with some types of industrial activity, runoff from construction sites covering more than 1 acre, surface mining operations, and some animal feeding operations (AFOs) and aquaculture facilities. Alabama regulations exclude some types of discharges from the NPDES program. Alabama regulations do not require NPDES permits for sewage from marine vessels, marine engine effluent, laundry, shower, and galley sink wastes, or any other discharge incidental to the

normal operation of a marine vessel. Permits are not required for NPS runoff from most agricultural and silvicultural activities except for those covered by AFO or concentrated animal feeding operation (CAFO) regulations. Permits also are not required for return flows from irrigated agriculture. Additionally, NPDES permits are not required for those who discharge into an injection well permitted by ADEM or the Alabama Oil and Gas Board.

Most NPDES permits require that the permit holder monitor permitted pollutant levels in the water to be discharged, which is referred to as effluent. Monitoring results are reported to ADEM on a periodic basis to ensure compliance. To accomplish this, permit holders submit monthly discharge monitoring reports (DMRs) to ADEM. Permit holders are required to keep records of monitoring results for a minimum of 3 years. ADEM uses the information reported and other information to develop its 305(b) report, which is submitted to EPA on no less than a bi-annual basis.

Permitted effluent limits are calculated using scientific criteria and designed to ensure that a discharge does not create conditions for water quality standards to be violated. There are some national technology-based standards for effluent limitations for some industries, such as pulp and paper, landfills, pharmaceutical manufacturing, and metals production or processing. If the addition of a new discharge would create a water quality standard violation, ADEM regulations prohibit the issuance of a NPDES permit. In Alabama, NPDES permits have a limit of 5 years and are renewable through a reissuance process. However, if the need arises to ensure that water quality standards are met, ADEM has the authority to reopen and change permits as required.

State Indirect Discharge Permits

Some industries send wastewater through a publicly owned treatment works (POTW) for treatment. Because these industries do not discharge directly to surface or groundwater, they do not have to obtain NPDES permits. However, they are required to obtain State Indirect Discharge (SID) Permits and to comply with pretreatment rules. Before a SID permit can be issued, the POTW must approve the discharge. State regulations prohibit industries from discharging anything to a POTW that may adversely affect the POTW, including volatile or hazardous chemicals and discharges with high temperatures. ADEM includes local limits in SID permits. These limits are based on technical evaluation and designed to ensure that the POTW's operations are not adversely affected. For SID permittees, ADEM may choose to require that Categorical Pretreatment Standards be followed. These standards specify the quantities or concentrations of pollutants that can be sent to the POTW.

Concentrated Animal Feeding Operation/Animal Feeding Operation Regulations

Alabama's rules for controlling surface water pollution from CAFOs/AFOs are designed to promote voluntary stewardship and effective management practices while minimizing administration requirements for agricultural producers. CAFO/AFO regulations apply to cattle, swine, poultry, fowl, dairy, stockyard, auction yards, farms, and other facilities with wild or domesticated animals.

AFO operations that qualify as CAFOs are required to register with ADEM and comply with NPDES rules. The criteria for defining CAFOs are included in the state regulations,

ADEM Administrative Code R. 335-6-7, *NPDES Best Management Practices, Registration Requirements, Technical Standards and Guidelines, Construction and Operation Requirements, Waste/Wastewater and Waste Product Treatment, Storage, Handling, Transport, and Disposal/Land Application, Nutrient Management, and Animal Mortality Management Requirements for Owners and Operators of Animal Feeding Operations (AFOs) and Concentrated Animal Feeding Operations (CAFOs)* (ADEM website: http://www.adem.state.al.us/Regulations/Div6a/Div6a.htm). In general, AFOs that are not CAFOs are not required to register with ADEM. An exception is for new AFOs that are located in watersheds that have been designated as priority, threatened, or water quality limited or impaired. New AFOs that locate in these watersheds are required to register with ADEM, and all AFOs, regardless of size, are required to maintain records and to comply with BMPs and other provisions of Alabama regulations.

Although voluntary efforts are encouraged, Alabama regulations do mandate that CAFO operators follow some specific procedures. These regulations are designed to protect water quality and public health and to minimize odors from CAFO operations. These regulations require that CAFO operators use BMPs that meet Natural Resource Conservation Service (NRCS) technical standards. Alabama's CAFO/AFO regulations contain provisions for animal waste treatment and disposal. These provisions include land application. Additionally, any AFO that is considered to be a significant contributor of pollution or that causes surface or groundwater pollution is subject to regulatory enforcement actions by ADEM.

Storm Water Phase I and Phase II Regulations

Many parts of the Tallapoosa River Basin are covered by storm water regulations. These regulations have been implemented under the CWA by EPA (and ADEM as the state-designated water quality agency) in Phase I and Phase II. However, not all areas of the state are covered by storm water regulation. Most large urban areas with separate storm sewer systems (populations greater than 100,000), which are often referred to as MS4s, are covered by Phase I regulations. Many smaller communities that have a total population of 50,000 people or greater or a population density of 1,000 people or more per square mile are covered by Phase II. Some communities that are considered by ADEM to have had historical pollution problems also are covered by Phase II. ADEM issues general permits to local governments with boundaries covered by the areas designated as Phase I or Phase II. Other sites, such as construction sites that disturb 1 or more acres, are covered by storm water regulations. Additionally, on construction sites, someone who has completed the Qualified Credential Inspection Program (QCIP) must conduct regular inspections.

To apply for a storm water permit, application forms must be submitted to ADEM. As part of the application process, MS4s must have a plan to reduce pollutants. The plan should include measures to eliminate illicit discharges. ADEM reviews applications and issues draft permits, which are placed for public comment. Once final permits are issued, MS4s also are required to monitor outfalls that are representative of the storm water system as a whole and to report monitoring results to ADEM. Other provisions of storm water permits require communities to implement programs to control polluted runoff, which includes education and outreach to address NPS issues.

Surface Mining Rules

There are a number of active and abandoned surface mines in the Tallapoosa River Basin. Alabama has promulgated rules specifically to protect its water resources from surface mining operations. These rules require that all surface mining operations be conducted in a manner to minimize surface water pollution and to prevent the violation of water quality standards. Surface mining operations must prepare a pollution prevention and/or abatement plan and submit this plan to ADEM for approval. These plans must include specific information about how pollution from the site will be minimized or controlled. ADEM rules provide guidelines for sediment control measures that should be addressed in pollution prevention and abatement plans. Surface mining operations also must obtain NPDES permits from ADEM. Additionally, surface mine operators must post bonds with the Alabama Surface Mining Commission (ASMC) and/or the Alabama Department of Industrial Relations (ADIR).

In addition to these requirements, Alabama regulations include numerous other provisions to minimize surface water pollution from surface mining operations. Soil, rock, trees, or other debris from mining operations cannot be placed in streams. Untreated wastewater from a mineral preparation plant, washing operation, or contaminated surface runoff cannot be discharged into surface water. Washing water must be directed to a sedimentation basin or abandoned mine for disposal. When mining operations cease, sedimentation basins cannot be abandoned without ADEM approval or the release of bonds from ASMC or ADIR.

Appendix H provides a list of NPDES permits and other registrations within the Tallapoosa River Basin.

Total Maximum Daily Loads

On a biennial basis, the CWA requires states to prepare and submit a 305(b) report and 303(d) list to EPA. This report includes the results of the state's monitoring efforts. The 305(b) report contains the known information about the state's waters. The 303(d) list only contains information about those waters that are too polluted or otherwise degraded to support their designated and existing uses (such as drinking water, swimming, recreation, and fishing). When developing this list, EPA does require that ADEM consider data collected by other entities if the data meet the state's requirement for data quality.

Once the 303(d) list is prepared, ADEM is required to develop TMDLs for each pollutant for which the water body is considered to be impaired. TMDLs are essential pollutant budgets, which provide loading limits or caps for particular pollutants. These limits are based on how much assimilative capacity (or allowable load) a water body has for a particular pollutant before exceeding water quality standards. The assimilative capacity is determined by considering the waste load allocation (WLA) for point sources, the load allocation (LA) for NPSs, and a margin of safety (MOS). The MOS is an extra measure that is

added to account for uncertainties and to help ensure environmental protection. Therefore, the formula for a TMDL is as follows:

TMDL = WLA + LA + MOS

According to the CWA, TMDLs only need to be developed for waters where implementation of technology-based standards would not result in the achievement of water quality standards. TMDLs can be established for each individual water body that is on the 303(d) list, or can be developed on a watershed basis.

Once ADEM drafts TMDLs, they are posted for public comment. After the comment period closes, ADEM responds to comments and submits the TMDLs to EPA for approval or disapproval. If the TMDL is not approved, EPA may request that the state revise the TMDL or EPA may develop the TMDL. In cases where EPA develops TMDLs, a formal federal rulemaking process must be followed.

Once TMDLs are developed, they should be implemented. Implementation can be achieved in numerous ways, and the implementation means depends on the type of pollutant that the TMDL addresses and the individual characteristics of a water body or watershed. For some TMDLs, load reductions in point source (NPDES) permits may be required. For other TMDLs, on-the-ground BMPs to control NPS issues may be the most appropriate solution. To implement TMDLs, numerous regulatory and other programs, such as education and outreach through the ACWP, may be used.

Sections 4 through 6 identify impaired water bodies in each respective watershed. Appendix I contains the 2002 Final 303(d) list that has been approved by EPA. Appendix B is the Draft 2004 303(d) list, which is awaiting EPA approval.

Groundwater Protection and Monitoring

In many parts of the state and in the Tallapoosa River Basin, there is a connection between groundwater and surface water. Groundwater provides a component to baseflow in streams that ranges from 10 to 20 percent. During times of drought, groundwater may be the only source of water and provide up to 50 percent of baseflow to streams. The CWA does not specifically address groundwater issues; however, some provisions of the CWA that are designed to protect surface water also protect groundwater. Likewise, rules administered by ADEM that are designed to protect groundwater also protect surface water. The ADEM Water Quality Program Rules 335-6-8-.03 and .05 specifically protect from pollution all underground sources of drinking water that contain less than 10,000 milligrams per liter (mg/L) of total dissolved solids, and prohibit the unauthorized discharge of fluids or pollutants to groundwater or soils. Additionally, the Groundwater Branch of ADEM administers programs to monitor underground storage tanks (USTs) and underground injection control (UIC). The Hazardous Waste and Solid Waste Programs provide regulations and guidance for groundwater monitoring and remediation that also can directly affect surface water.

Water Withdrawals

In lieu of a permitting system, Alabama requires water users to declare the quantity of water withdrawn for consumption by submitting a form entitled "Declaration of Beneficial Use" (DBU) to the Alabama Department of Economic and Community Affairs (ADECA), Office of Water Resources (OWR). ADECA also is responsible for the administration of the state Water Use Reporting Program.

Under the DBU program, any person who intends to divert waters of the state should file a DBU with the OWR. Along with other information, these declarations report the source and location of the withdrawal, the estimated actual and maximum quantity of the withdrawal, and the primary use of the water that is diverted. The minimum threshold prescribed for declaring usage is 100,000 gallons per day (gpd) from any waters of the state. However, any user that has the capacity to use 100,000 gpd for irrigation and all public water suppliers must declare actual usage regardless of the amount. Those who are diverting surface waters for emergency purposes for less than a 30-day period do not have to file for a DBU.

Upon submission of a DBU, the OWR verifies the information for completeness, then issues a Certificate of Use to the user. The only subsequent requirement for certificate holders is for annual reporting of average monthly use and peak withdrawals for each month. The duration of Certificates of Use is 5 to 10 years, and the length of the duration is determined by the OWR. Certificates of Use are renewable. However, if the conditions of the Certificate of Use are not met, the OWR has the authority to revoke, terminate, or modify the Certificate of Use. Those who hold Certificates of Use are required to report the actual estimated water use to the OWR. The information that is reported allows the OWR to track the quantity of water that is being diverted from surface water.

Appendix D presents surface water demands based on withdrawal information from the OWR for the Tallapoosa River Basin.

Drought Management

In September 2003, the OWR released a draft of the *Alabama Drought Management Plan*. This plan includes actions to be taken during drought conditions in order to minimize drought disasters. The plan details responsibilities for monitoring drought conditions and for making recommendations on ways to conserve water during drought conditions. The OWR uses USGS gauges and monitoring wells to track drought conditions. In the Tallapoosa Basin, the OWR uses station 02412000, which is on the Tallapoosa River in Heflin County. There is one groundwater monitoring well in the basin, located in the Gordo Formation in Montgomery County.

The plan also details the responsibilities of the Alabama Drought Assessment and Planning Team (ADAPT) and the Drought Impact Group (DIG). Each of these citizen groups advises and provides support to the OWR regarding drought issues.

Flood Management

There are four hydropower dams operated by APCo on the Tallapoosa River. As noted in Exhibit 2-2 (Section 2), these dams are as follows:

- R. L. Harris Dam, which is in Randolph County
- Martin Dam, which is in Tallapoosa/Elmore County
- Yates Dam, which is in Tallapoosa/Elmore County
- Thurlow Dam, which is in Tallapoosa/Elmore County

The APCo projects store water and release it into the river systems. Typically, water levels in the reservoirs are lowered by releasing water in the fall and winter. During the spring, levels rise due to rain events, and these levels are maintained during the warm months to allow for recreation and power generation.

The hydropower dams help to contain the river in reservoirs and to control flooding during heavy rains. However, some storm events or series of storm events cannot completely be managed by the APCo projects. In these cases, excess water may be released to flood easements to help minimize the effects of flooding downstream. By controlling floodwaters in this manner, the dams and reservoirs in APCo's hydroelectric generating system can help control local flooding and allow for more extensive development in some river banks.

Interstate Water Compacts

On November 20, 1997, through Public Law 105-105, the states of Alabama and Georgia entered into the ACT River Basin Compact. This compact has been the subject of extended debate. The ACT Compact established the ACT Commission, which is responsible for working with the states to determine the water supply allocation formula. Although the agreement was made in 1997, the states have yet to agree on a water allocation. This is the method through which each state will receive an equitable apportionment of surface waters within the ACT Basin. The Alabama OWR is tasked with serving as Alabama's liaison with federal agencies and the ACT Commission regarding the ACT Compact. Detailed information about the ACT Compact and the progress that has been made is available at: http://www.actcompact.alabama.gov/.

Onsite Septic Disposal

The Alabama Department of Public Health (ADPH) is responsible for oversight of the installation of onsite treatment systems, which generally are referred to as septic tanks. Septic tanks are common in the Tallapoosa River Basin and are located in areas where sanitary sewer service is not available. In many cases, onsite disposal is the only alternative for homeowners in rural areas, including communities located on the reservoirs. Alabama law requires that property owners obtain a permit from their local county health department before installing a new septic tank or onsite sewage disposal system. Permits also are required for making repairs to an existing system.

Part of the permit process is a soil percolation test, which can be performed by a registered engineer, a land surveyor, or a county health department representative. Property owners

submit an application and percolation test results to the health department for evaluation. If the evaluation shows that there are restrictions for the proper use of a septic system on a particular site, a registered engineer must design the system. There are numerous alternative septic system designs that may be used when soil conditions are not ideal. After the system design is approved, a permit is issued and the system can be installed by a licensed installer. However, the health department will inspect the newly constructed system before it is covered.

A similar permit process is followed for making repairs to existing systems. As well, the ADPH has the authority to inspect systems for failure and to require that property owners make repairs to systems when malfunctions are discovered. However, ADPH does not have enforcement authority. Therefore, if a property owner is in violation of the law and does not follow ADPH's instructions, cases are managed through civil procedures.

Decentralized wastewater systems are small, community-based wastewater management systems ideally suited to rural and developing areas. These systems collect, treat, and reuse wastewater near the point of generation, thus minimizing collection systems, solids handling, and stream discharge. Most systems use an "effluent sewer" concept for collecting wastewater, which essentially uses a septic tank at each home to remove solids, while transporting liquid waste through small-diameter sewer lines to a local treatment facility. Treatment is accomplished via simple attached-growth biological processes (very cost-effective), then treated effluent is dispersed (or reused) via in-ground methods (including subsurface drip irrigation). This method of wastewater management is cost-effective, protects the public health, minimizes (or eliminates) stream discharges, and provides for enhanced property values and development. Public or private (certified by the ADPH) utilities manage decentralized wastewater infrastructure. In-ground dispersal (or reuse) of treated effluents is permitted through ADEM via UIC permits (for systems more than 10,000 gpd) and through the ADPH (for systems less than 10,000 gpd).

Endangered Species, Threatened Species, and Critical Habitat

Over time, species of fish, wildlife, and plants have become extinct as the result of an imbalance between growth and development and environmental conservation. In an attempt to prevent continued extinction, the U.S. Congress passed the Endangered Species Act. The purpose of this act is to conserve the ecosystems of species that are considered to be endangered or threatened. The act allows designated agencies to take appropriate steps to achieve this objective. These steps may include designating some areas as critical habitat for selected species. The FWS of the Department of the Interior is the primary agency responsible for maintaining the list of T&E species and for defining and enforcing conservation measures.

Critical habitat is a specific geographic area, which may be occupied by a T&E species that needs special management to conserve and/or preserve the species. As referenced in Section 2, the FWS has designated parts of the Tallapoosa River Basin as critical habitat for 11 mussel species. Exhibits 2-13 and 2-14 (Section 2) depict the locations of critical habits and Exhibit 2-15 lists the affected mussel species and describes the habitat in which they may reside.

Critical habitat identifies specific areas that are essential to the conservation of a listed species, and that may require special management considerations or protection. Federal agencies are not likely to approve or fund activities that may jeopardize species in critical habitat areas, such as destruction or alteration of habitat.

The Alabama Department of Conservation and the FWS oversee programs to protect T&E species. Each of these agencies participates in permitting and other regulatory processes for activities that may affect T&E populations. Descriptions of the T&E species in the Tallapoosa River Basin are provided in Section 2.

Other Programs for Protecting and Maintaining Water Quality

Numerous tools are available for use by local governments and stakeholders to help protect surface water.

Zoning, Building Codes, and Easement Restrictions

Local governments have the authority to establish ordinances to control and restrict activities that may jeopardize surface water quality. In Alabama, incorporated cities and towns have the authority to establish and enforce zoning, building codes, and easement restrictions. County governments have more limited authority, but can establish subdivision regulations to help guide development. Some counties in Alabama have successfully obtained limited home-rule authority through the passage of county-specific legislation.

New Federal Tools

Since 1972, through the NPDES program and other regulations associated with the CWA, water pollution from point source discharges has been reduced significantly. However, EPA recognizes the need to also address NPS pollution. To accomplish this, EPA issued two new rules (on water quality trading and watershed-based permitting) that communities can use as tools to address NPS issues. Neither of these policies has been implemented in Alabama at this time. Additional information about these policies can be located on EPA's website at www.epa.gov.

Water Quality Trading

EPA issued the final Water Quality Trading guidance in January 2003. The Water Quality Trading policy's purpose is to offer more flexible ways to meet and exceed water quality standards and to reduce the cost of improving and maintaining the quality of surface waters. The policy's goal is to increase the speed and success of cleaning up impaired rivers, streams, and lakes.

Water quality trading programs use economic incentives to improve water quality. Through trading, one pollution source is able to meet its regulatory requirements through the use of pollutant reduction credits, which are created by another source that has lower pollution control costs. The water quality standards and criteria remain the same, but pollution control costs can be decreased and overall environmental protection can be improved.

Watershed-based Permitting

In December 2003, EPA released the *Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance*. This guidance demonstrated EPA's support of the concept of watershed-based permitting through the NPDES program. Through watershed-based NPDES permitting, multiple point sources located within a watershed can be permitted through one permit to meet water quality standards. This is an alternative to addressing pollutants on an individual discharge basis and allows for multiple stressors within a watershed to be considered.

4. Upper Tallapoosa

4. Upper Tallapoosa

Background Information

The Upper Tallapoosa (HUC 03150108) watershed is defined as all lands within the State of Alabama that drain to the confluence of the Tallapoosa and Little Tallapoosa rivers in southwestern Randolph County. This watershed is contained within portions of Cleburne, Clay, and Randolph counties. Roughly half of it lies in Cleburne County, with the smallest portion (less than one quarter of the total land area) in Clay County. All upstream areas within the State of Georgia fall within the Tallapoosa headwaters watershed, the planning for which is governed by the Georgia Environmental Protection Division (EPD). The combined Upper Tallapoosa and Tallapoosa Headwaters watersheds encompass approximately 1,453 square miles, nearly two-thirds of which is in Alabama (Exhibit 4-1). The Tallapoosa CWP has established Upper Tallapoosa boundaries, which vary slightly from the HUC. As defined by the Tallapoosa CWP, the Upper Tallapoosa Watershed ends at Harris Dam, not at the confluence of the Tallapoosa and Little Tallapoosa rivers. For the purposes this plan, the USGS 8-digit HUC will be used, but all descriptions of Lake Wedowee (R. L. Harris Reservoir) will be included in this section rather than in Section 5.

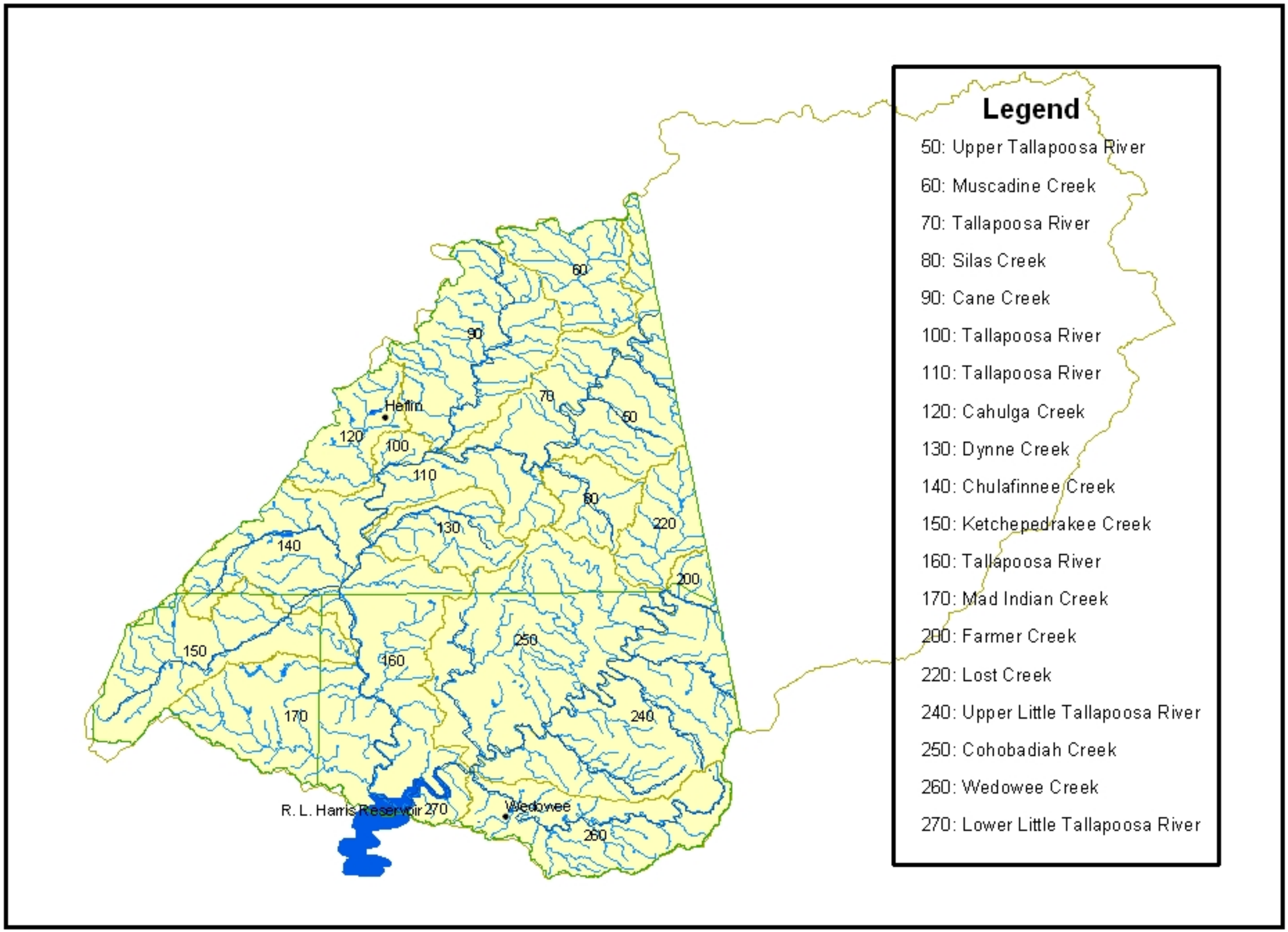
R. L. Harris Reservoir (Lake Wedowee)

The primary receiving water body in the watershed is R. L. Harris Reservoir (Exhibit 4-2), which is located in west-central Randolph County. The lake was developed for hydroelectric power by APCo, and is operated and managed under a cooperative agreement among APCo, the COE, and the FERC. It is the newest of 14 dams and is located below the confluence of the Tallapoosa and Little Tallapoosa rivers in the foothills of the Talladega Mountains. Construction on Harris Dam was initiated on November 1, 1974, and the hydroelectric plant began service on April 20, 1983.

With a total surface area of 10,660 acres (nearly 17 square miles), a maximum depth of 121 feet, and 271 miles of shoreline, Lake Wedowee is the second largest lake located entirely within the boundaries of the 10-county East Alabama Region. Lake Wedowee offers many recreational activities in a scenic rural setting.

Two smaller creeks (Wedowee and Ketchepedrakee creeks) serve as main tributaries of the lake. The City of Wedowee flanks the eastern and southeastern shores of the lake. The City of Heflin, the largest city in Cleburne County and the entire watershed, is roughly 30 miles north of the lake, while the City of Lineville in Clay County is nearly 10 miles west of the lakeshore. Although Heflin and Lineville are the only cities with populations of 1,000 or more, the watershed is located only 65 miles east of downtown Birmingham and 65 miles west of downtown Atlanta along I-20. Montgomery and Auburn also are located within 100 miles of the lake.

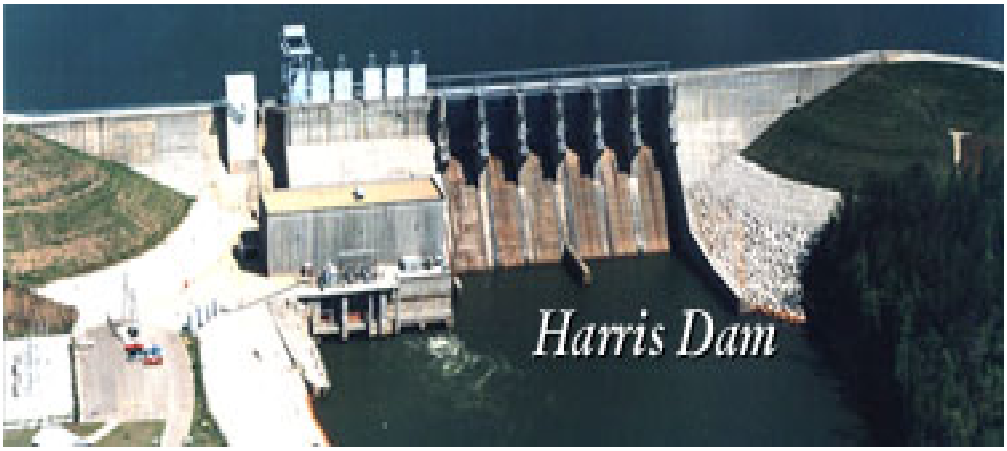
Insert Exhibit 4-1



CH2MHILL

Exhibit 4-1
Upper Tallapoosa Watershed
Tallapoosa River Basin Management Plan

EXHIBIT 4-2
Harris Reservoir Dam
Tallapoosa River Basin Management Plan



(Photo Source: Alabama Power Company)

The ongoing efforts to widen U.S. Highway 431 to four lanes will enhance highway access to the watershed and induce greater north/south traffic through the subbasin from I-20 to Lake Wedowee. The relative driving convenience of the watershed from Anniston and Atlanta and the rural charm of the area contribute to the gradual encroachment of urban and suburban development along the eastern and western fringes of the subbasin.

Although several urbanizing areas are close to Lake Wedowee, the Upper Tallapoosa River Basin is primarily rural in nature. The western flanks of the watershed fall within the purchase boundaries of the Talladega National Forest and are largely undeveloped. Forest lands predominate throughout the watershed. Scattered agricultural uses dot the landscape in the subbasin, but the amount of land within the watershed devoted to agriculture has declined significantly over the past 50 years. A trend toward suburban-scale residential development continues. Limited concentrations of urban development can be found in only two cities in the watershed–Heflin and Wedowee.

Water Quality and Biological Data

Exhibit 4-3 lists the sources of water quality and biological data for the Upper Tallapoosa Watershed. Data from these agencies were used to populate the Upper Tallapoosa CWP Dataviewer (www.cleanwaterpartnership.org/uppertallapoosa/), as well as to guide stakeholders in an assessment of water quality and biological concerns.

For the purposes of this plan, recent water quality data (5 years old or less) were obtained from ADEM, the Alabama Water Watch Association (AWWA), and USGS (Exhibit 4-3).

EXHIBIT 4-3
Water Quality and Biological Data in the Upper Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Agency	Period of Record	Project/Report Name	Data Type
ADEM	2002 - 2003	Alabama's 2004 Integrated Water Quality & Assessment Report (§305(b) Report)	Chemical, physical, habitat, biological
ADEM	1997	Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997	Chemical, physical, biological
ADEM	1997 – 2003	Alabama Monitoring and Assessment Program (ALAMAP)	Chemical, physical, habitat
ADEM	2000	Screening Assessment of the Tallapoosa River Basin–2000	Chemical, habitat, biological
ADEM	2000	§303(d) Water Body Monitoring Project	Chemical, habitat, biological
ADEM	2002	Alabama 2002 Water Quality Report to Congress (Clean Water Act §305(b) Report)	Chemical, physical, habitat, biological
ADPH	2003	Fish Consumption Advisories	Fish
AWW	1998 – 2003	Lake Wedowee Property Owners Association	Chemical
SWCD	1998	County Watershed Assessments	Watershed
USGS	1997 – 2001	Real-time, Peak Flow, Daily Flow, Water Quality	Chemical, physical

Upper Tallapoosa Reservoir Studies

ADEM monitors water quality in Lake Wedowee and the watersheds in the Upper Tallapoosa on a periodic rotating schedule as part of its Reservoir Water Quality Monitoring Program.

In 1997, ADEM performed intensive monitoring of the Tallapoosa River to establish a baseline of data before any water diversion activities began in Georgia. The *Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs* (ADEM, 1997) reports that total nitrogen concentrations in the upper Harris Reservoir and the Little Tallapoosa River portion of Harris were the second and third highest for the Tallapoosa River, respectively. The total phosphorus concentrations also were measured as the second highest for the upper Harris Reservoir. The mean chlorophyll *a* concentrations in the Upper reservoir, Middle reservoir, and Little Tallapoosa embayment were the highest in the Tallapoosa except for the Saugahatchee Embayment (Lower Tallapoosa watershed). TSI values throughout Lake Wedowee varied between eutrophic during all months except June to mesotrophic and oligotrophic from April through September. DO concentrations in Harris were similar at all locations throughout the growing season and were above the water

*The trophic state index (**TSI**) is a measure of eutrophication using a combination of measures of turbidity, chlorophyll a concentrations, and total phosphorus levels.*

quality standard of 5 mg/L. Temperature-depth profiles were indicative of a weak thermal stratification in April that became pronounced through the rest of the growing season.

Surface Water Quality Screening Assessment

The *2000 Surface Water Quality Screening Assessment of the Tallapoosa River Basin* (ADEM, 2000) describes the results of the Tallapoosa River Basin Nonpoint Source Screening Assessment conducted in 2000. In this report, four subwatersheds were recommended for NPS priority status. Streams are rated in this manner if the benthic or fish communities are ranked as fair or poor. Exhibit 4-4 lists those streams, their HUCs, and the watershed name.

EXHIBIT 4-4
Nonpoint Source Priority Status Streams in the Upper Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Stream	Impairment	Watershed	HUC	Potential Source
Cedar Creek	Fish (moderate)	Tallapoosa River	03150108110	None identified
Little Lost Creek	Benthic/Fish (moderate)	Lost Creek	03150108220	Pasture
Bear Creek	Benthic/Fish (moderate	Upper Little Tallapoosa River	03150108240	Row crop, poultry houses, and pasture/cattle
Cutnose Creek	Benthic/Fish (moderate	Upper Little Tallapoosa River	03150108240	Row crop, poultry houses, and pasture/cattle
Cohobadiah Creek	Benthic/Fish (moderate)	Cohobadiah Creek	03150108250	Animal husbandry, pasture runoff, and mining
Pineywoods Creek	Benthic/Fish (moderate)	Cohobadiah Creek	03150108250	Animal husbandry, pasture runoff, and mining

Notes:
HUC = hydrologic unit code
Source: ADEM, 2000.

Alabama Report to Congress

ADEM's 2004 §305(b) Report to Congress states that Harris Reservoir is eutrophic based on the mean TSI values collected in August and September 1985 through the present in the dam forebay. Lake Wedowee is considered to be fully supporting its water use classification.

Fish Tissue Surveys

Finally, ADEM conducts annual fish tissue sample surveys in lakes and rivers across the state. The sample fish tissues collected through this survey are analyzed for the presence of toxic substances. The results from this analysis are used as the basis for fish consumption advisories issued by ADEM. In Fiscal Year (FY) 2003, ADEM conducted a survey at two

locations on Lake Wedowee in addition to three other downstream locations on the Tallapoosa River. No fish consumption advisories were issued for Lake Wedowee or the Tallapoosa River based on those surveys. Further review by the East Alabama Regional Planning and Development Commission (EARPDC) revealed no record of any past fish consumption advisories issued by ADEM for Lake Wedowee.

Alabama Water Watch Program

In the Lake Wedowee area, the AWW program is actively supported by the Lake Wedowee Poperty Owners Association. Conclusions from these water quality monitoring records are contained in a 2003 report entitled, *Citizen Volunteer Water Quality Monitoring of Alabama's Reservoirs, Volume 4: Lake Wedowee* (Deutsch, 2003). The AWW data are consistent with ADEM's data, which indicated that the nutrient content and chlorophyll *a* concentrations in Lake Wedowee are considerably higher than in Lake Martin.

USGS Data

The data obtained from the USGS website for stations 02412000 (Tallapoosa River near Heflin, Alabama) and 02413300 (Little Tallapoosa River near Newell, Alabama) consisted of flow (cfs), temperature (degrees Celsius [°C]), and specific conductivity; these data were collected between 1952 or 1968 (respectively) and the present. None of the USGS data are indicative of water quality impairments.

Biotic Species Information

Periodic inventories of fish populations in Lake Wedowee have been conducted by the Fisheries Section of the ADCNR. The purpose of these reports is to collect detailed inventories of fish populations and diversity in major lakes to assist the district biologist in determining management strategies to enhance the fishery. As the most prominent water resource feature in the Upper Tallapoosa Watershed, Lake Wedowee has become a significant habitat area for plants and animals. At a time when critical wetland resources are disappearing rapidly, the creation of Lake Wedowee helped provide a new water habitat area to support local plant and animal species.

Lake Wedowee supports a wide range of fish species, as verified by the *Harris Reservoir Management Report* prepared by the Fisheries Section of ADCNR annually. The survey information is supplemented by bass tournament information collected through the Bass Anglers Information Team (B.A.I.T.). According to the August 16, 2000, report, a total of 13 species of fish were identified in Lake Wedowee. The four predominant species of fish in the lake are spotted bass, bluegill sunfish, gizzard shad, and threadfin shad. These species represent more than 65 percent of the total survey catch. Other fish species found to inhabit the lake include largemouth bass, black crappie, redbreast sunfish, redear sunfish, green sunfish, warmouth sunfish, spotted sucker, blacktail redhorse, and blacktail shiner. The study also reported that the catch restrictions on Lake Wedowee appear to have been successful in promoting greater mean total lengths for largemouth bass in the lake.

In addition to supporting a diverse fish population, Lake Wedowee and its tributaries throughout the Upper Tallapoosa Watershed are essential elements of a diverse regional habitat area that is capable of supporting T&E species of plants and animals. In fact, Clay,

Cleburne, and Randolph counties support several T&E species (Exhibit 4-5). Two of these species–the little amphianthus plant and the fine-lined pocketbook mussel–live in aquatic environments. Other rare species also may inhabit the watershed. The Upper Tallapoosa Watershed provides a valuable and critical habitat area and resources for a number of important plant and animal species.

EXHIBIT 4-5
Threatened, Endangered, and Candidate Species
Tallapoosa River Basin Management Plan

Species Common Name	Scientific Name	Designation
White fringeless orchid	*Platanthera integrilabia*	Candidate Species
Fine-lined pocketbook mussel	*Lampsilis altilis*	Endangered
Little amphianthus	*Amphianthus pusillus*	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Endangered

Watershed Assessment

In conjunction with the Upper Tallapoosa Watershed Committee, an assessment of the Upper Tallapoosa Watershed was conducted. Water quality data were obtained (Exhibit 4-3) and compiled. For each concern identified, a potential source was determined and a priority ranking established.

Impaired Stream Segments

Streams on the §303(d) list and other water bodies for which scientifically defensible water quality or biological data indicate impairment are considered to be known water quality or biological concerns. Water bodies that fall into this category are listed in Exhibit 4-6. Stakeholders in the Upper Tallapoosa Watershed prioritized these concerns based on their severity, feasibility of resolution, and degree of risk to the environment and public health.

Tallapoosa River Subwatershed

In the Tallapoosa River subwatershed, a segment of the Tallapoosa River (south of Heflin between County Highways 36 and 19) was placed on the 2000 §303(d) list for OE/low DO. It was removed from the §303(d) list because a TMDL for the river segment was approved by EPA on October 31, 2002. According to EPA records, ADEM added the Tallapoosa River Segment in Cleburne County to the §303(d) list during the 1998 cycle. Potential sources of impairment include industrial and municipal discharges and pasture grazing. The approved

EXHIBIT 4-6
Upper Tallapoosa Impaired Water Bodies from the Draft 2004 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concerns	Potential Source(s)	Priority
Tallapoosa River	Organic enrichment/low DO	WWTP Poultry operation Forest Pasture/hay Row cropping	Low
	pH	Fertilizer Agricultural land Unknown Naturally occurring	Low
	Pathogen contamination	Urban development Septic systems	Low
Wolf Creek	Pathogen contamination	Animal feeding operation	High

Note:
DO = dissolved oxygen
WWTP = wastewater treatment plant
Source: ADEM, 2000, 2002, and 2004

TMDL requires a 66.7-percent load reduction of carbonaceous biochemical oxygen demand (CBOD) and nitrogenous biochemical oxygen demand (NBOD) for NPSs, a 95-percent load reduction from the Heflin wastewater treatment plant (WWTP), and a 90-percent load reduction from the Tyson Poultry plant during the critical period (May through November).

In this subwatershed, pH measurements below 6.0 were detected 2.8 percent of the time between 1997 and 2003. Most of the measurements were obtained from the Tallapoosa River (TALC-001, TALC-002, TALC-003, TALC-004, TALC-005, and TALC-005) and Wolf Creek (WOLF-1, WOLF-2, and WOLF-3). Stakeholders suspect that these low pH readings may be caused by the improper use of fertilizers, poor agricultural practices, or some other natural or unknown source.

Another water quality concern in this watershed is fecal coliform counts that exceeded 2,000 colonies (col)/100 milliliters (mL) 2 percent of the time from 1999 through 2002. The exceedances both occurred in the Tallapoosa River (TALC-001 and TALC-002).

Wolf Creek Subwatershed

Only one stream in the Upper Tallapoosa Watershed is on the Alabama Draft 2004 §303(d) list. This creek is located in northern Randolph County and drains south-southeast into the Little Tallapoosa River. Wolf Creek was placed on the list in 1996, based on information indicating that the stream was contaminated by nutrients, pathogen contamination (fecal coliform from animal waste), ammonia, and OE (resulting in low levels of DO). However, no historic water quality data supporting the 1996 listing of Wolf Creek could be identified. In October 1998, EPA approved a delisting of Wolf Creek for nutrient enrichment only.

Subsequent water tests conducted by ADEM in 2001 and 2002 failed to support the original findings of ammonia and OE/low DO contamination in the creek. Therefore, ADEM removed Wolf Creek from the 2002 §303(d) list for those two contaminants.

Water quality monitoring performed by ADEM did, however, identify fecal coliform (pathogen) levels that exceeded the water quality standard for streams designated as F&W. The ADEM field crew also discovered visual evidence of animal tracks along the streambanks and manure in the stream during testing, which further confirmed the presence of pathogens in the creek. Because there are currently no point source discharges in Wolf Creek, agricultural runoff and unrestricted access to the river by farm animals are considered the primary sources of contamination. Therefore, Wolf Creek remains on the §303(d) list for pathogen contamination. However, it should be noted that the cattle at the contamination site subsequently were rotated to other grazing lands, and no further evidence of active contamination has been documented.

ADEM has developed a TMDL to establish a target threshold for pathogen reduction. The TMDL has been approved by EPA, and calls for a 61-percent reduction in NPS loads (contaminants) that would contribute to pathogen contamination.

Water Quality Concerns

Observations by stakeholders who have local knowledge of watersheds, known issues that may become serious in the future, and other anecdotal information are listed as potential concerns in Exhibit 4-7. In addition, the screening assessments from ADEM and the watershed assessments performed by the SWCDs were used to develop Exhibit 4-7. There are no water quality or biological data available to support these concerns.

EXHIBIT 4-7
Upper Tallapoosa Watershed Water Quality Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concern(s)	Potential Source(s)	Priority
Upper Tallapoosa Watershed	Nutrient enrichment	Poultry WWTP lagoon	Medium
Upper Tallapoosa Watershed	Pathogen contamination	Poultry WWTP lagoon	Medium
Upper Tallapoosa Watershed	Siltation	Dirt roads/roadbanks	Low
Upper Tallapoosa Watershed	Other	Illegal dumping	Low
Muscadine Creek Watershed	Nutrient enrichment	Poultry	Low
Muscadine Creek Watershed	Pathogen contamination	Poultry	Low
Muscadine Creek Watershed	Other	Illegal dumping	Low
Tallapoosa River Watershed (070) [1]	Nutrient enrichment	Poultry	Medium
Tallapoosa River Watershed (070) [1]	Pathogen contamination	Poultry	Medium
Tallapoosa River Watershed (070) [1]	Other	Illegal dumping	Low

EXHIBIT 4-7
Upper Tallapoosa Watershed Water Quality Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concern(s)	Potential Source(s)	Priority
Tallapoosa River Watershed (070) [1]	Siltation	Dirt roads/roadbanks Logging	Low
Silas Creek Watershed	Nutrient enrichment	Poultry	Low
Silas Creek Watershed	Other	Illegal dumping	Low
Silas Creek Watershed	Pathogen contamination	Livestock Poultry	Low
Silas Creek Watershed	Siltation	Dirt roads/roadbanks	Low
Cane Creek Watershed	Nutrient enrichment	Poultry	Medium
Cane Creek Watershed	Other	Illegal dumping	Low
Cane Creek Watershed	Pathogen contamination	Poultry	Medium
Tallapoosa River Watershed (100) [1]	Other	Illegal dumping	Low
Tallapoosa River Watershed (110) [1]	Nutrient enrichment	Agricultural land Poultry Animal processing plant	Low
Tallapoosa River Watershed (110) [1]	Pathogen contamination	Agricultural land Poultry Animal processing plant	Low
Tallapoosa River Watershed (110) [1]	Other	Illegal dumping	Low
Tallapoosa River Watershed (110) [1]	Siltation	Urban development Dirt roads/roadbanks Streambanks	Low
Cahulga Creek Watershed	Nutrient enrichment	Urban storm water runoff Filter plant Septic tanks Poultry WWTP lagoon Animal processing plant	Medium
Cahulga Creek Watershed	Pathogen contamination	WWTP lagoon Septic tanks Poultry Filter plant	Medium
Cahulga Creek Watershed	Other	Illegal dumping	Low
Dynne Creek Watershed	Nutrient enrichment	Poultry	Low
Dynne Creek Watershed	Pathogen contamination	Poultry	Low
Dynne Creek Watershed	Other	Illegal dumping	Low
Chulafine Creek Watershed	Nutrient enrichment	Poultry WWTP	Medium

EXHIBIT 4-7
Upper Tallapoosa Watershed Water Quality Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concern(s)	Potential Source(s)	Priority
Chulafine Creek Watershed	Pathogen contamination	Poultry WWTP	Medium
Chulafine Creek Watershed	Siltation	Unknown source Dirt roads/roadbanks Streambanks	Low
Chulafine Creek Watershed	Other	Illegal dumping	Low
Ketchepedrakee Creek Watershed	Siltation	Urban development Livestock Dirt roads/roadbanks Streambanks	Low
Ketchepedrakee Creek Watershed	Pathogen contamination	Poultry Septic tanks	Medium
Ketchepedrakee Creek Watershed	Nutrient enrichment	Poultry Septic tanks	Medium
Ketchepedrakee Creek Watershed	Other	Illegal dumping	Low
Tallapoosa River Watershed (160) [1]	Siltation	Dirt roads/roadbanks Urban development Livestock Gullies Mining	Low[2]
Tallapoosa River Watershed (160) [1]	Pathogen contamination	Animal waste Livestock Poultry Septic tanks	Low
Tallapoosa River Watershed (160) [1]	Nutrient enrichment	Animal waste Livestock Poultry Septic tanks	Low
Tallapoosa River Watershed (160) [1]	Other	Illegal dumping	Low
Mad Indian Creek Watershed	Siltation	Agricultural land Dirt roads/roadbanks Cropland Timbering Livestock Gullies	Low
Mad Indian Creek Watershed	Pathogen contamination	Animal waste Septic tanks Poultry	Low
Mad Indian Creek Watershed	Nutrient enrichment	Animal waste Septic tanks Poultry	Low
Mad Indian Creek Watershed	Other	Illegal dumping	Low

EXHIBIT 4-7
Upper Tallapoosa Watershed Water Quality Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concern(s)	Potential Source(s)	Priority
Farmer Creek Watershed	Nutrient enrichment	Poultry	Medium
Farmer Creek Watershed	Pathogen contamination	Poultry	Medium
Farmer Creek Watershed	Other	Illegal dumping	Low
Lost Creek Watershed	Nutrient enrichment	Poultry	Medium
Lost Creek Watershed	Pathogen contamination	Poultry	Medium
Lost Creek Watershed	Other	Illegal dumping	Low
Upper Little Tallapoosa River Watershed	Nutrient enrichment	Livestock Poultry Animal waste Septic tanks	Medium
Upper Little Tallapoosa River Watershed	Pathogen contamination	Animal waste Livestock Poultry Septic tanks	Medium
Upper Little Tallapoosa River Watershed	Siltation	Agricultural land Dirt roads/roadbanks Livestock Timbering Suburban development Gullies Mining	Low
Upper Little Tallapoosa River Watershed	Other	Illegal dumping	Low
Upper Little Tallapoosa River Watershed	Low DO	Low flow	Low
Cohobadiah Creek Watershed	Nutrient enrichment	Animal waste Livestock, poultry Septic tanks	Medium
Cohobadiah Creek Watershed	Pathogen contamination	Animal waste Livestock Poultry Septic tanks	Medium
Cohobadiah Creek Watershed	Siltation	Cropland Agricultural land Dirt roads/roadbanks Flooding Urban development Livestock Gullies Streambanks	Medium
Cohobadiah Creek Watershed	Other	Illegal dumping	Low

EXHIBIT 4-7
Upper Tallapoosa Watershed Water Quality Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality Concern(s)	Potential Source(s)	Priority
Wedowee Creek Watershed		Animal waste Livestock Septic tanks WWTP lagoons Poultry Urban storm water runoff	High
Wedowee Creek Watershed		Animal waste Livestock Septic tanks WWTP lagoons Poultry	High
Wedowee Creek Watershed	Siltation	Cropland Agricultural land Dirt roads/roadbanks Livestock Urban storm water runoff Gullies	High
Wedowee Creek Watershed	Other	Illegal dumping	Low
Wedowee Creek Watershed	Low DO	WWTP lagoons	High
Wedowee Creek Watershed	Pesticides	Urban storm water runoff	Low
Lower Little Tallapoosa River Watershed	Pathogen contamination	Septic tanks	Medium
Lower Little Tallapoosa River Watershed	Other	Illegal dumping	Low

Notes:
[1] Four subwatersheds in the Upper Tallapoosa have the same generic subwatershed name–Tallapoosa River.
[2] Urban development is prioritized high.
CAFO = concentrated animal feeding operation
WWTP = wastewater treatment plant
DO = dissolved oxygen

Prioritized Watersheds

Stakeholders in the Upper Tallapoosa Watershed prioritized the water quality impairments (Exhibit 4-6) and concerns (Exhibit 4-7). These concerns were ranked based on §303(d) listings, TMDL status, and personal observations. All subwatersheds with poultry CAFOs were considered to be medium priority. In addition, urgent §303(d) listings and other critical concerns that can easily be addressed were ranked high. Concerns that are ranked medium are less immediate, more difficult to address, or have fewer data to support them. Low priority concerns have no data to support them, are not a frequent problem, or could have been caused by drought or other naturally occurring conditions.

Watershed Management Strategies

Exhibit 4-8 lists the management strategies developed by the Upper Tallapoosa CWP to address water quality concerns previously described.

EXHIBIT 4-8
Upper Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality Concern	Management Strategies
Nutrient enrichment	Aid in the development of a rural septic management system on a county level by obtaining funding for alternative sewage treatment system demonstration projects
	Evaluate the role of municipal sewer systems (current capacity and treatment with current and future needs) throughout the basin–i.e., feasibility study; meet with local officials, raise funds to address wastewater problems
	Educate children and adults about septic system maintenance via door hangers, flyers, seminars, and classroom instruction and projects
	Encourage overall good agricultural practices by promoting the economic benefits of the NRCS programs
	Educate stakeholders about the proper fertilization of lawns through the master gardeners' program
	Promote water quality training for master gardeners, other volunteer groups, and developers/contractors through advertisement
	Promote existing ACES programs by working with agricultural producers to properly use BMPs with a publicity campaign
	Support AWW program–encourage the expansion of the program into headwaters by contacting stakeholders in the Heflin area; continue monitoring
	Obtain CEU credit for teachers attending watershed education programs
	Sponsor the Homeowners Septic Tank Pump-Out Workshop–provide discounted pump-out coupons
Pathogen contamination	Aid in the development of a rural septic management system on a county level by obtaining funding for alternative sewage treatment system demonstration projects
	Evaluate the role of municipal sewer systems (current capacity and treatment with current and future needs) throughout the basin–i.e., feasibility study; meet with local officials, raise funds to address wastewater problems
	Encourage enforcement of county prima facie litter law
	Educate children and adults about septic system maintenance via door hangers, flyers, seminars, and classroom instruction and projects
	Continue the annual cleanup with Alabama Power Company (Renew Our Rivers program)
	Identify litter hot spots (research where it is coming from), report results to ADEM
	Educate adults and contractors about illegal dumping and litter through anti-litter campaigns (use ACWP nerdy man posters, Legacy billboards, UTWC Litter and Illegal Dumping educational brochures, and ACWP PSAs)

EXHIBIT 4-8
Upper Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality Concern	Management Strategies
	Promote existing ACES programs by working with agricultural producers to properly use BMPs with a publicity campaign
	Obtain CEU credit for teachers attending watershed education programs
	Support AWW program–encourage the expansion of the program into headwaters by contacting stakeholders in the Heflin area; continue monitoring
	Sponsor the Homeowners Septic Tank Pump-Out Workshop–provide discounted pump-out coupons
	Promote and support the NRCS EQIP program
Siltation	Request additional professional logging manager certification classes in the Upper Tallapoosa Watershed
	Discourage dirt road subdivisions–work with local legislators to beef up subdivision regulations
	Encourage county engineers to use and maintain proper BMPs for construction of dirt roads; sponsor ADEM dirt road workshop
	Report failing BMPs and other problems to DOT and County engineer representative
	Work with forestry companies to require stricter BMPs of their subcontractors
	Work with Treasure Forest association to educate foresters by promoting certification process
	Encourage DOT and County Engineers to participate in CWP
	Investigate incentive for DOT and County highway departments for workshop–CEU for PEs
	Initiate open space preservation (Land Trust) or “environmentally sensitive growth” initiatives
Litter/Illegal Dumping	Implement the Adopt-a-Highway program
	Explore adoption of countywide mandatory garbage collection
	Coordinate hazardous waste collection program
	Request that power company place trash bins at the boat ramps
	Advocate the use of bottle and can deposits
	Encourage enforcement of county prima facie litter law
	Suggest that municipalities employ litter bug suit as punishment for littering
	Continue the annual cleanup with Alabama Power Company (Renew Our Rivers program)
	Identify litter hot spots (research where it is coming from); report results to ADEM

EXHIBIT 4-8
Upper Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality Concern	Management Strategies
	Educate adults and contractors about illegal dumping and litter through anti-litter campaigns (use ACWP nerdy man posters, Legacy billboards, UTWC Litter and Illegal Dumping educational brochures, and ACWP PSAs)
	Erect signs signifying watershed boundary to discourage illegal dumping
	Expand and coordinate the Project ROSE program to educate the public about the proper disposal of used oil
Low dissolved oxygen	Support AWW program–encourage the expansion of the program into headwaters by contacting stakeholders in the Heflin area; continue monitoring
	Evaluate the role of municipal sewer systems (current capacity and treatment with current and future needs) throughout the basin–i.e., feasibility study; meet with local officials, raise funds to address wastewater problems
pH	Support AWW program–encourage the expansion of the program into headwaters by contacting stakeholders in the Heflin area; continue monitoring
	Promote incentive-based fertilizer education
	Promote water quality training for master gardeners, other volunteer groups, and developers and contractors through advertisement
Pesticide	Educate general public and significant users (ALDOT) with seminars and flyers
	Promote water quality training for master gardeners, other volunteer groups, and developers and contractors through advertisement
	Organize a Household and Agricultural Hazardous Waste Collection day in the tri-county area
	Promote incentive-based fertilizer education

Notes:
NRCS = Natural Resource Conservation Service
ACES = Alabama Cooperative Extension System
BMP = best management practice
CEU = continuing education unit
AWW = Alabama Water Watch
ADEM = Alabama Department of Environmental Management
ACWP = Alabama Clean Water Partnership
UTWC = Upper Tallapoosa Watershed Committee
PSA = public service announcement
EQIP = Environmental Quality Incentive Program
PE = professional engineer
DOT = Department of Transportation
CWP = Clean Water Partnership
ALDOT = Alabama Department of Transportation

Nutrient Management

Because of the large number of CAFOs and AFOs, nutrient management should be a high priority in the Upper Tallapoosa Watershed, especially in subwatersheds that are close to

Lake Wedowee. Several programs are available to aid stakeholders in the watershed management process. The Alabama Cooperative Extension System (ACES) and the NRCS work with landowners to develop nutrient management plans. One strategy that could be used is the application of fertilizer at agronomic rates, which prevents overfertilization and saves farmers money. The NRCS provides education about riparian buffer protection. The City of Wedowee is actively pursuing state and federal funding to upgrade its WWTP lagoon system. Grant funds could be obtained for an interstate program with the Tallapoosa Headwaters and Upper Tallapoosa Watershed to develop a holistic watershed program that focuses on nutrient management. In addition, stakeholders can apply for Section 319 grant funds where applicable.

Monitoring Plan

Using the concerns listed in Exhibits 4-6 and 4-7, the §303(d) list, and water quality and biological data collected (Exhibit 4-3) as a guide, the following strategies have been developed as a suggested monitoring plan.

Existing Monitoring

Three organizations currently are monitoring or have monitored water quality in the Upper Tallapoosa Watershed during the past 5 years. Exhibit 4-9 displays the location of sampling sites monitored by ADEM, AWW, and USGS. Most of these sampling sites are located in the immediate vicinity of Lake Wedowee.

Monitoring Objectives

Monitoring objectives include the following:

- Continue to monitor the water quality and aquatic integrity of the Upper Tallapoosa Watershed
- Document trends in water quality
- Monitor §303(d)-listed water bodies for improvement
- Coordinate monitoring efforts rather than duplicating them
- Document effectiveness of basin management plan
- Identify areas that need additional attention

Proposed Monitoring Approach

A monitoring plan should be developed to meet each of the objectives listed above. The plan should outline the monitoring locations, types of monitoring, and parameters. The monitoring plan should be reviewed periodically to determine if it is meeting the objectives. In addition, watershed objectives may change over time as additional information is learned about the health of the watershed. Thus, the monitoring plan also should be reviewed in light of new information and any changed watershed plan objectives. The following briefly outlines information to consider while developing a detailed monitoring plan.

Insert Exhibit 4-9

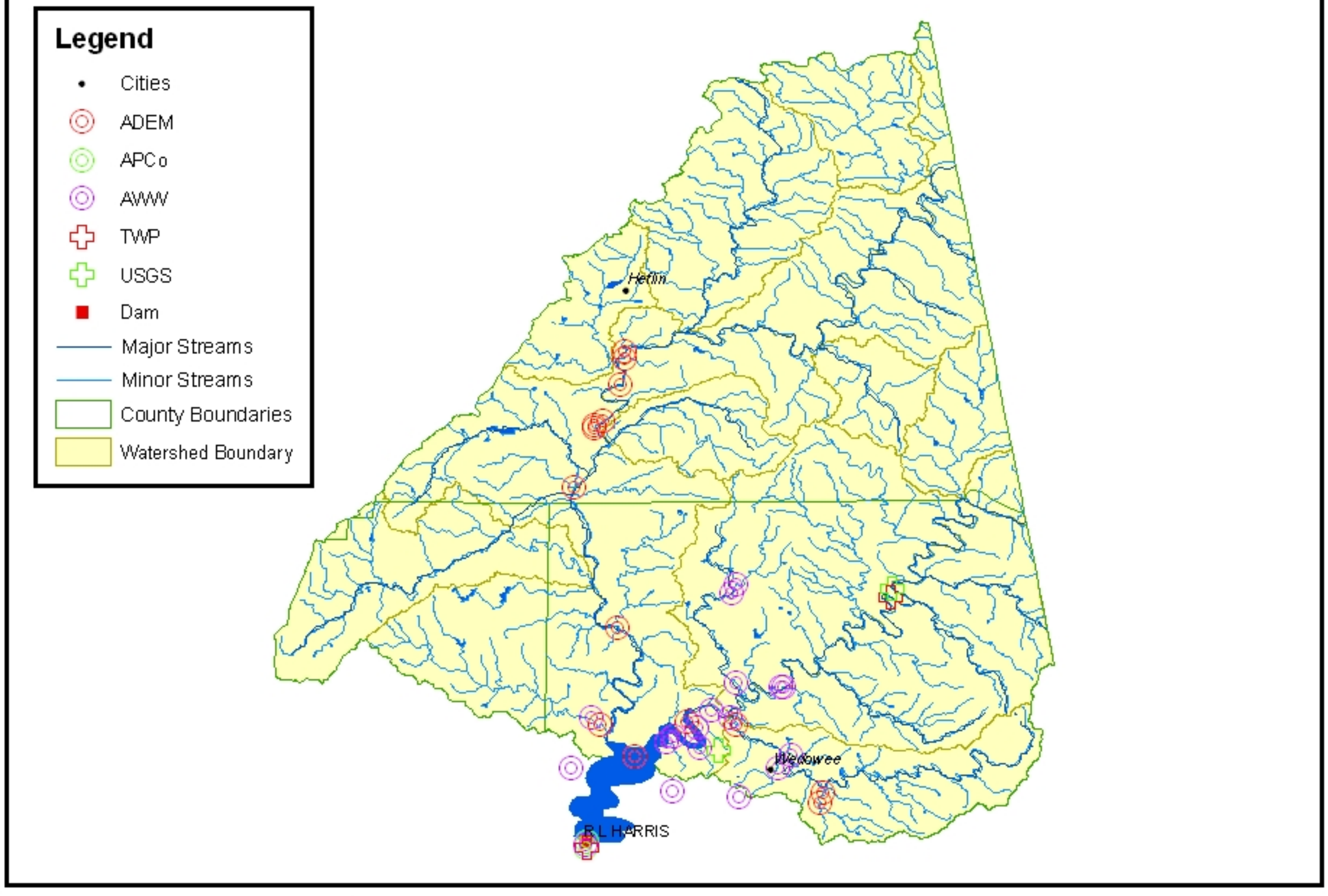


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Exhibit 4-9
Existing Sampling Locations in the Upper Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Water Quality Data

Any new water quality monitoring locations should be focused in watersheds with the least amount of data. The subwatersheds outside of the Lake Wedowee area are the most data-poor areas. With the exception of the Heflin area, it is unlikely that AWW groups will be established because of the rural nature of the remaining portions of the Upper Tallapoosa Watershed. However, universities (such as Auburn University) and state and federal agencies (ADEM, GSA, and USGS) should be encouraged to perform studies in this watershed. The following parameters are suggested for future monitoring:

- *In-situ* measurements–temperature (air and water), pH, DO, turbidity, and conductivity
- Chemical analysis–total suspended solids (TSS), nitrate-nitrite, ammonia, total phosphorus, total hardness, 5-day biochemical oxygen demand (BOD_5), and alkalinity
- Bacteriological tests–either fecal coliform or E. *coli*

Bioassessment Data

Bioassessments provide information about the long-term health of the aquatic community, which is indicative of the long-term health of the watershed. Organizations such as universities, state and federal agencies, and, to a limited extent, citizen volunteer groups, can perform benthic macroinvertebrate, fish, and habitat assessments. Unfortunately, varying protocols are used in the State of Alabama. The methodology used by ADEM is preferred for the sake of consistency. However, EPA approval of AWW's bioassessment methods is anticipated within the 2005 to 2006 timeframe.

Implementation Plan

Organizational Structure

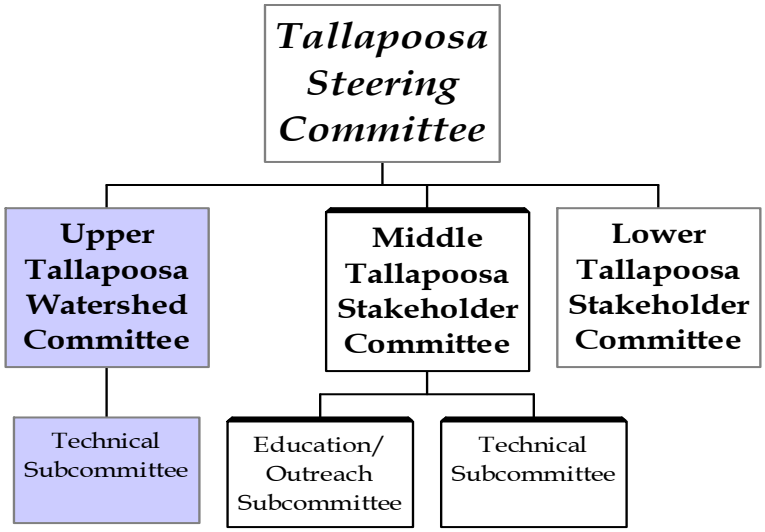
The Tallapoosa River Basin CWP is 1 of 10 basin organizations under the ACWP, which is the statewide umbrella organization. Each of the 10 basins, including the Tallapoosa, has a facilitator who works to coordinate stakeholders in their efforts to protect and restore surface waters within their respective basins. The ACWP and each basin organization are stakeholder-based and driven. Because issues, demographics, and resources vary from basin to basin, facilitators depend on local stakeholders to identify local problems and solutions.

The organizational structures of the 10 basin groups vary and have changed over time. Participation in CWP organizations is voluntary and most of the management strategies recommended in this plan are designed to be implemented on a voluntary basis. The exceptions are management strategies in urban areas that are related to regulatory policies, such as storm water permits. Each participating partner has the ability to either influence or control the implementation of the strategies described in Exhibit 4-8. For example, municipalities can pass local ordinances, private industries can employ innovative technologies that provide better environmental protection, universities can conduct various studies, private citizens can create and implement community-based education and outreach programs, and all stakeholders can help to seek funding and other resources to support strategy implementation.

Although the watershed stakeholder groups are linked through one basinwide organization, each meets and functions independently. Some of the watershed organizations have developed subcommittees to address specific issues and tasks. The Upper Tallapoosa Stakeholder Committee meets on a monthly basis. The Upper Tallapoosa Technical Subcommittee actively met to develop the assessment and management strategies for this watershed. Other Upper Tallapoosa Watershed Committee (UTWC) subcommittees meet on an as-needed basis. Exhibit 4-10 depicts the Tallapoosa River Basin CWP.

When implementing the recommended watershed management strategies, participating stakeholders should coordinate efforts among collaborating entities and individuals to prevent the potential duplication of activities and waste of limited resources. Stakeholders also should work to pool resources to maximize the funding and in-kind services available to support the implementation of the basin management plan. Because some management strategies are similar in the Middle and Lower Tallapoosa watersheds, collaborative efforts among all basin stakeholders to implement these strategies are encouraged. Additionally, some strategies may be implemented through collaboration and coordination with the ACWP on a statewide basis.

EXHIBIT 4-10
Tallapoosa River Basin CWP Organizational Chart
Tallapoosa River Basin Management Plan

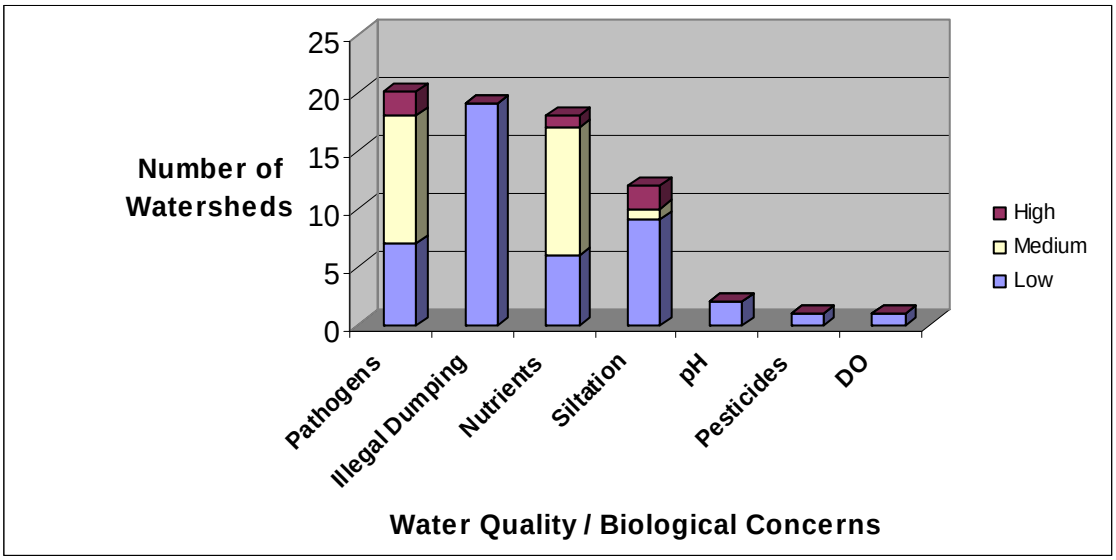


Priorities

During the watershed assessment process, stakeholders have prioritized water quality and biological concerns. Several water bodies with impairments (identified by the §303(d) list) were identified as high priority in the Tallapoosa River and Wolf Creek watersheds. The primary concerns are nutrient enrichment, pathogen contamination, siltation, and illegal dumping. Because of limited resources, it is recommended that efforts be focused on the areas with high priority.

Exhibit 4-11 illustrates the frequency of occurrence of assessed priorities for NPS water quality and biological concerns as identified by stakeholders for each subwatershed. For example, pathogen contamination was identified as a concern in almost 20 subwatersheds and was prioritized as a medium concern more often than it was considered to be a high or low concern. However, illegal dumping is a concern in fewer than 20 subwatersheds and is always considered to be low priority. Pathogen contamination, illegal dumping, and nutrient enrichment were assessed as concerns in almost all of the 19 subwatersheds. Pathogen contamination was identified as a concern in all of the subwatersheds. Generally, the sources were estimated to be from poultry CAFOs, livestock, and failing septic tank systems or wastewater treatment facilities.

EXHIBIT 4-11
Watershed Water Quality and Biological Concern Priorities
Tallapoosa River Basin Management Plan



Illegal dumping was found to be a pervasive problem throughout the Upper Tallapoosa Watershed. The source is commonly illegal dumping sites in the rural areas and littering in the urban areas.

Nutrient enrichment was identified as a concern in all of the subwatersheds except for the Tallapoosa River (100) subwatershed. Primarily, the potential sources were determined to be poultry CAFOs, livestock, and failing septic systems or wastewater treatment facilities.

Siltation also was identified as a concern in 11 of the subwatersheds (Exhibit 4-7). In most cases the siltation is caused by dirt roads and roadbanks, silviculture, and sometimes urban development.

Approach

The Upper Tallapoosa is composed of 19 eleven-digit hydrologic units and encompasses all or part of three counties. It is not feasible to try to implement all of the management strategies identified in Exhibit 4-8 immediately. Therefore, it is recommended that high

priority subwatersheds be addressed first. Exhibit 4-12 provides an example of how the stakeholders in the Upper Tallapoosa Watershed could proceed.

EXHIBIT 4-12
Implementation Approach
Tallapoosa River Basin Management Plan

Order of Approach	Suggested Steps
Step 1	Rank or prioritize each subwatershed
Step 2	Target top three subwatersheds for implementation projects
Step 3	Establish on-the-ground projects that will address the concerns that have been identified
Step 4	Assign responsibility to stakeholders
Step 5	Determine how to fund projects
Step 6	Obtain funding
Step 7	Begin implementation

Watershed-based Plans

The ADEM Office of Education and Outreach, Nonpoint Source Unit supports the development of watershed-based plans. These plans focus in greater detail on individual subwatersheds. A resource management and protection plan has been developed for Lake Wedowee (EARPDC, 2003). This plan discusses the economic impacts of Lake Wedowee, characterizes the watershed, and offers recommendations to address issues related to tourism, land use and development, infrastructure, and water quality. Although this plan does not meet EPA's nine key elements, it is a good starting place for any of the subwatersheds in the vicinity of Lake Wedowee. The *Lake Wedowee Resource Management and Protection Plan* (EARPDC, 2003) outlines three threats to the environment: 1) pathogen contamination; 2) nutrient enrichment; and 3) roadside litter. The 11 water quality recommendations offered in this plan are as follows:

1. Prepare a watershed management plan for the entire Upper Tallapoosa Watershed.
2. Work with the agricultural community to apply BMPs in the Wolf Creek subwatershed to achieve the pathogen load reduction required by the Wolf Creek TMDL and to serve as a pilot program for other priority subwatersheds impaired by agricultural runoff.[1]
3. Continue and expand the existing water quality public involvement and education program initiated by the UTWC.
4. Continue to conduct the Recycled Oil Saves Energy (ROSE) project in Randolph County and expand the program to Clay and Cleburne counties.

[1] Stakeholders may apply for Section 319 grant funds where available.

5. In partnership with the Lake Wedowee Property Owners Association, continue to coordinate and promote expansion of the AWW monitoring program around Lake Wedowee to help identify potential water quality problems.
6. Explore the adoption of countywide mandatory garbage collection in Randolph and Clay counties and higher fines for littering and illegal dumping.
7. Explore the feasibility of conducting a regional Household Collection program in Clay, Cleburne, and Randolph counties.[2]
8. Explore opportunities to establish a pilot water quality trading program in the Upper Tallapoosa Watershed.
9. Expand the Alabama Forestry Commission's TREASURE Forest program within the watershed to recognize forest landowners who have used BMPs.
10. Finance and expand local continuing education training classes for the Professional Logger Manager (PLM) certification program.
11. Develop local alternative sewage treatment system demonstration projects.

The Plan also provides a 3-year implementation schedule.

Education/Outreach

Stakeholder education, outreach, training, and educational programs are important for effective implementation of a watershed management plan. The public is often unaware that the combined efforts of their actions can cause significant NPS pollution problems. Proper education about day-to-day activities such as using appropriate amounts of fertilizer, recycling motor oil, and collecting and disposing of pet waste can have a huge effect in reducing NPS pollutant loadings to rivers and streams. Stakeholders must be provided with good information and resources to increase awareness of water quality problems. Informed watershed users and concerned citizens are more conscious of how their activities affect the water they depend on, and they will be more willing to modify their activities to meet water quality goals.

Education and outreach can be carried out by agencies (local, statewide, or national) or by volunteers. Some of the methods used to provide educational information to the public include television, radio and newspaper announcements and stories, flyers, community newsletters, workshops and seminars, and teacher in-service programs. Individuals also receive information through participation in citizen-based watershed stewardship groups and volunteer monitoring programs. Partnerships among various stakeholders and interest groups are key to long-term water quality improvements. Many consider education and outreach to be one of the most effective tools in helping to improve water quality in the watershed.

[2] The Household Collection program is referring to the Household Hazardous Waste Collection program.

Ongoing Activities

Several education and outreach activities have been used in the Upper Tallapoosa Watershed. Nutrient enrichment, pathogen contamination, siltation, and illegal dumping are the primary concerns that have been identified by stakeholders (Exhibits 4-7 and 4-8).

Educational activities that have occurred or are ongoing include the following:

- **AWW–**The Lake Wedowee Property Owners Association has been trained to monitor and evaluate the physical, chemical, and bacteriological features of water. The members currently monitor 18 sites. During the first half of 2004, they held three training sessions.
- **Water Fair–**In June 2003, a water fair was held at the Randolph County high school. Several informational booths were set up by organizations such as ACES, ADEM, and AWW. More than 100 participants attended. This fair may become an annual event.
- **Project ROSE–**In the Upper Tallapoosa, 750 to 1,000 gallons of used oil were collected from 8 locations as part of a Project ROSE campaign initiated by the Upper Tallapoosa CWP in 2003.
- **Agricultural Chemical Amnesty Days–**This event was held for Bullock, Chambers, Clay, Elmore, Coosa, Lee, Macon, Montgomery, Randolph, and Tallapoosa counties as part of a project by the Alabama Department of Agriculture and Industries, funded by a §319 grant. The purpose of the event is to allow for the collection of unwanted pesticides, herbicides, insecticides, fungicides, or rodenticides.
- **Environmental Education Brochures–**Through a grant from the EARPDC, a set of six environmental education brochures was developed specifically for the Upper Tallapoosa Watershed. The brochures are as follows: 1) What we all Need to Learn About Water; 2) How Sediments Affect Your Water Quality; 3) How Litter and Illegal Dumping Affect Your Water Quality; 4) How Pathogens Affect Your Water Quality; 5) How Thermal Stress Affects Your Water Quality; and 6) How Nutrients Affect Your Water Quality.
- **Logger BMP Training Sessions–**The ACES in Randolph County conducts annual training sessions. These training opportunities provide the continuing education credits that certified loggers need to maintain their certification.
- **Poultry Waste Management Training–**The ACES performs training for certified animal waste vendors.
- **AFO/CAFO Education–**The ACES provides education for poultry producers.
- **Science Fair–**In 2003, stakeholders in the Upper Tallapoosa CWP held a science fair for high school students, primarily in Clay County. The environmental education brochures were used by the students to develop a science project. The winning student received a $500 award donated by APCo.
- **Water Jeopardy–**More than 600 members of about 22 4-H club participated in Water Jeopardy. This game educates young students about water quality and was performed by members of the ACES in conjunction with the UTWC.

Stakeholder-suggested Activities

In the Upper Tallapoosa Watershed, many effective educational programs are in place that focus on water quality issues. However, much more could be done to raise awareness and to educate local citizens about the importance of protecting surface water. Some potential educational strategies identified by the Upper Tallapoosa stakeholders are as follows:

- **Educate the Public about Septic Tank Maintenance–**Educate children and adults about septic system maintenance via door hangers, flyers, seminars, and classroom instruction and projects.
- **Encourage Proper Fertilizer Usage–**Educate stakeholders about proper lawn fertilization through the master gardeners' program.
- **Reduce Siltation–**Discourage dirt road subdivisions; work with local legislators to beef up subdivision regulations.

Additional Education and Outreach Opportunities

Other potential educational strategies that may be considered include the following:

- **Expand AWW Program–**Currently, the Lake Wedowee Property Owners have an AWW group that monitors the water quality of the lake at 18 sites. There is no citizen monitoring occurring in any other portions of the Upper Tallapoosa Watershed.
- **Use ACWP Bulletin Board Project to Educate 5th Graders in the Watershed–**The ACWP Education/Outreach Subcommittee has developed this program to target 5th grade students. It is a classroom activity designed to teach students about their local watershed and personal pollution. This project could be employed in the tri-county area.
- **Work with ACES and NRCS/SWCD to Encourage Proper Nutrient Management–**The ACES has several nutrient management programs in place, and the NRCS and SWCD have cost share programs that will aid landowners in financing the implementation of these programs.
- **Employ "Litter Bug" Penalty to Discourage Littering and Illegal Dumping–**Some municipalities have employed the concept of punishing people who litter by requiring them to wear a "litter bug" suit while collecting trash. This penalty is in addition to monetary fines.
- **Newspaper Articles–**Submit monthly informative articles to local newspapers about current water projects, water events, or water facts. This approach will aid in community awareness of the environment and inspire interest in conservation practices.
- **Posters and Bumper Stickers–**Educational posters and informative bumper stickers promoting stewardship of natural resources can be produced to increase public interest; these can be distributed to schools and to the general public.
- Establish groundwater or water festivals in each county.
- Encourage participation in Legacy's Envirobowl.
- Encourage participation in the Envirothon program.

On-the-Ground Strategies

Increasing public awareness and implementing BMPs are both required to improve the water quality and biological integrity of a watershed. The counties in the Tallapoosa River Basin do not have home-rule regulatory authority. The only zoning they can establish is for subdivision regulations. Therefore, the types of on-the-ground strategies that can be employed in the jurisdiction of city governments will be different from those in other areas. The implementation methods discussed below for rural areas will be more restricted than those for urban areas.

Urban BMPs

Because of the steady increase in population in the Clay, Cleburne, and Randolph tri-county area, effects from urban development should be considered. Environmentally sensitive or low-impact development (LID) is one means of protecting and enhancing hydrologic systems. This approach aims to mimic the functions of natural environments to reduce floods in developed areas, to reduce storm water storage requirements, to improve the water quality of runoff, and to help maintain and restore fish habitat. When implemented properly, LID allows for increased growth with minimal environmental effects.

The primary parameters of concern most frequently identified by the Upper Tallapoosa CWP are nutrient enrichment, pathogen contamination, siltation, and illegal dumping. The matrix chart in Exhibit 4-13 provides recommended management strategies for cities and counties in the Upper Tallapoosa Watershed. Some strategies address multiple water quality and biological concerns.

EXHIBIT 4-13
Urban BMPs
Tallapoosa River Basin Management Plan

Parameters	Riparian Buffers	Pervious Parking	Surface Sand Filter	Biosolids Reuse	Constructed Wetlands	Storm Drain Stenciling	Illicit Discharge Detection & Elimination
Nutrient enrichment	X		X	X			
Pathogen contamination	X	X	X		X		X
Siltation	X		X		X		X
Illegal Dumping						X	

Rural BMPs

Because of the lack of home rule authority for the counties in the Tallapoosa River Basin, it is best to work with existing regulatory programs and other voluntary means to effect watershed improvements. In the Upper Tallapoosa, primary concerns in rural areas are

related to agriculture and forestry. Exhibits 4-14 and 4-15 list management strategies, some of which were suggested by Upper Tallapoosa Watershed stakeholders.

Agriculture

The most common water quality concerns generated by certain agricultural practices are caused by the presence of sediment, excessive nutrients, pesticides, bacteria, and a variety of other chemicals used in the farming industry. Proper agricultural practices (Exhibit 4-14) can be used to avoid creating water quality and biological concerns. The NRCS, SWCDs, and ACES have a range of cost share (Section 7) and educational programs for landowners to use.

EXHIBIT 4-14
Agricultural BMPs
Tallapoosa River Basin Management Plan

Parameters	Conservation Tillage	Conservation Buffers	Livestock Fencing	AFO Management	Erosion and Sediment Control
Nutrient enrichment	X	X	X	X	X
Pathogen contamination		X	X	X	
Siltation	X	X	X	X	X

Note:
AFO = animal feeding operation

Forestry

Properly managed forestlands provide water, fish and wildlife habitat, esthetic value, and recreational opportunities. Exhibit 4-15 lists established forestry BMPs, along with the water quality and biological parameters they address.

EXHIBIT 4-15
Forestry BMPs
Tallapoosa River Basin Management Plan

Parameters	Preharvest Planning	Streamside Management Zones	Forest Wetlands Protection	Road Construction and Maintenance	Revegetation	Fire Management
Nutrient enrichment	X	X	X		X	X
Pathogen contamination		X				
Siltation	X	X	X	X	X	X

5. Middle Tallapoosa

5. Middle Tallapoosa

Background Information

The Middle Tallapoosa Watershed is defined as all lands and surface waters that drain to the Tallapoosa River between the confluence of the Tallapoosa and Little Tallapoosa rivers west of Wedowee in Randolph County and Martin Dam, located about 40 miles northeast of Montgomery. It is comprised of 22 subwatersheds encompassing portions of 7 counties: Chambers, Clay, Coosa, Elmore, Lee, Randolph, and Tallapoosa (Exhibit 5-1). Approximately half of its 1,590-square-mile drainage area lies in Tallapoosa County. For cataloging purposes, the Middle Tallapoosa section is identified by HUC 03150109.[1]

Lake Martin Reservoir

The primary receiving water body in the watershed is Martin Reservoir (commonly referred to as Lake Martin). Martin Dam and the resulting reservoir storage were developed for hydroelectric power generation by APCo (Exhibit 5-2). Martin Dam was the first of four reservoir projects on the Tallapoosa River. When construction was completed in 1926, the resulting water impoundment was the largest man-made lake in the world. First known as the Cherokee Bluffs project, the dam was later named in honor of Thomas W. Martin, the company's visionary leader and its president and later chief executive officer from 1920 to 1963.

Lake Martin impounds 31 miles of the Tallapoosa River, creating a lake with 700 miles of shoreline, a surface area of nearly 40,000 acres, and a storage capacity of 1,622,000 acre-feet or nearly 530 billion gallons. It is the second deepest lake in Alabama. Along the impounded river's main channel, or thalwag, the maximum depth reaches 155 feet.

Under current licensing provisions of the FERC and cooperative agreements with the COE, the Martin project is operated and managed for multiple purposes including hydropower, flood control, downstream navigation and minimum flow requirements, F&W habitat, water quality, water supply, and recreation. The current license issued by FERC in May 1978 authorizes APCo to operate the Martin Dam project until June 2013. Typically, 5 to 7 years before the expiration date of a FERC license, input is solicited from stakeholders to ensure that issues relating to the project's multiple uses are addressed during relicensing.

Exhibit 5-3 depicts the storage that APCo allocates during a typical year. The flood control guideline facilitates the management of seasonal changes in water storage. This change results in a winter pool level of 478 to 480 feet and a summer full-pool level of 490 feet. Summer pool levels in reservoirs typically are higher to maximize the power generation capacity to accommodate the seasonal market demand for electricity, to meet recreational needs for the peak demand season, and to have sufficient water to satisfy downstream flow

EXHIBIT 5-1
Middle Tallapoosa Watershed
Tallapoosa River Basin Management Plan

[1] Note that the Fox Creek (010) subwatershed and the majority of the Tallapoosa River subwatershed (020), which drain to and include the southern half of R. L. Harris Reservoir (Lake Wedowee), are cataloged as part of the Middle Tallapoosa River segment (HUC 03150109).

Legend

10: Fox Creek
20: Tallapoosa River
30: Crooked Creek
40: Cornhouse Creek
50: Beaverdam Creek
60: Hurricane Creek
70: High Pine Creek
80: Chikasanoxee Creek
90: Hodnett Mill Creek
100: Chatahospee Creek
110: County Line Creek
120: Sweetwater Creek
130: Emuckfaw Creek
140: Timbergut Creek
150: Enitachopco Creek
160: Little Hillabee Creek
170: Hillabee Creek
180: Tallapoosa River
190: Elkahatchee Creek
200: Sandy Creek
210: Blue Creek
220: Oakachoy Creek

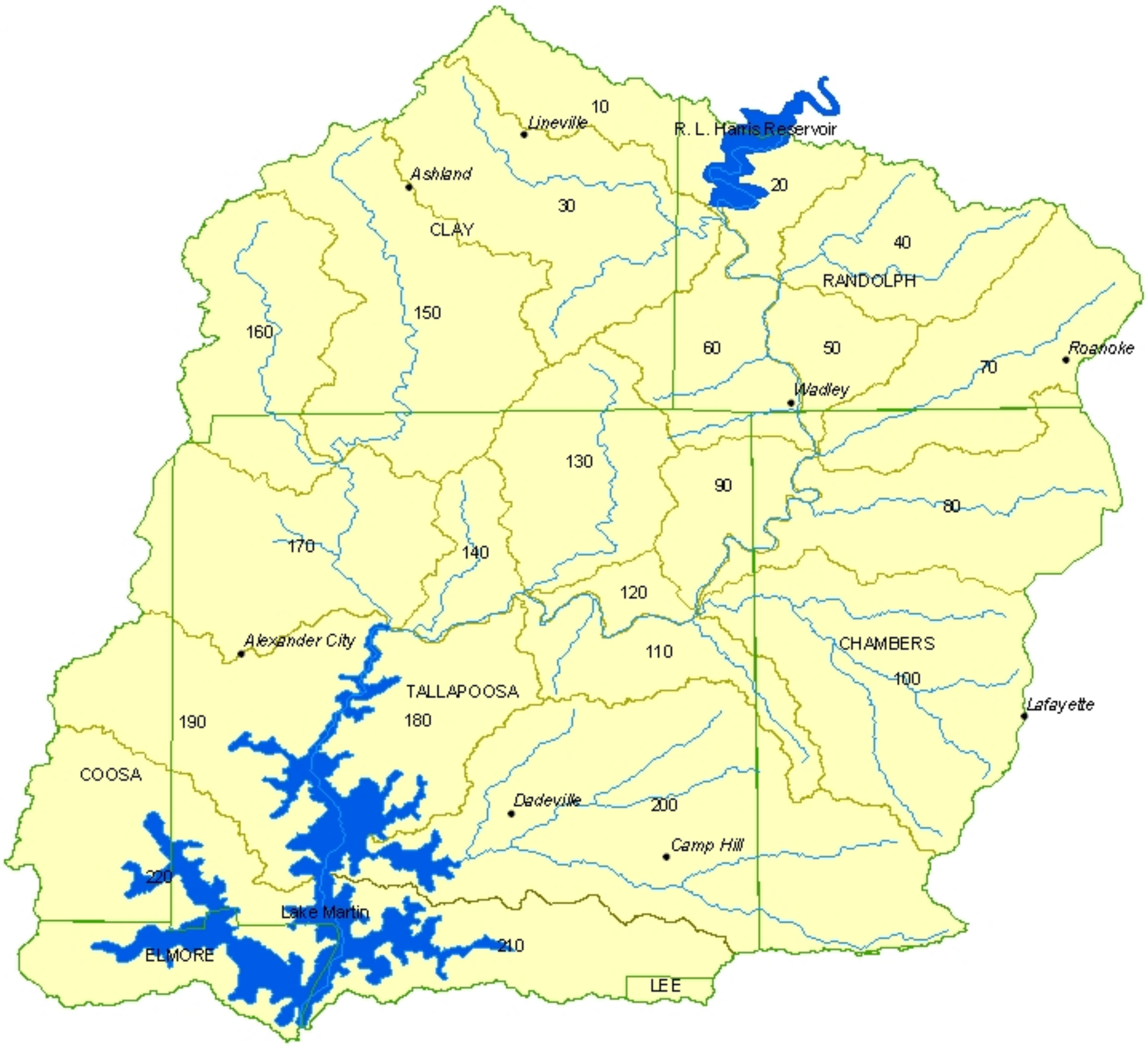


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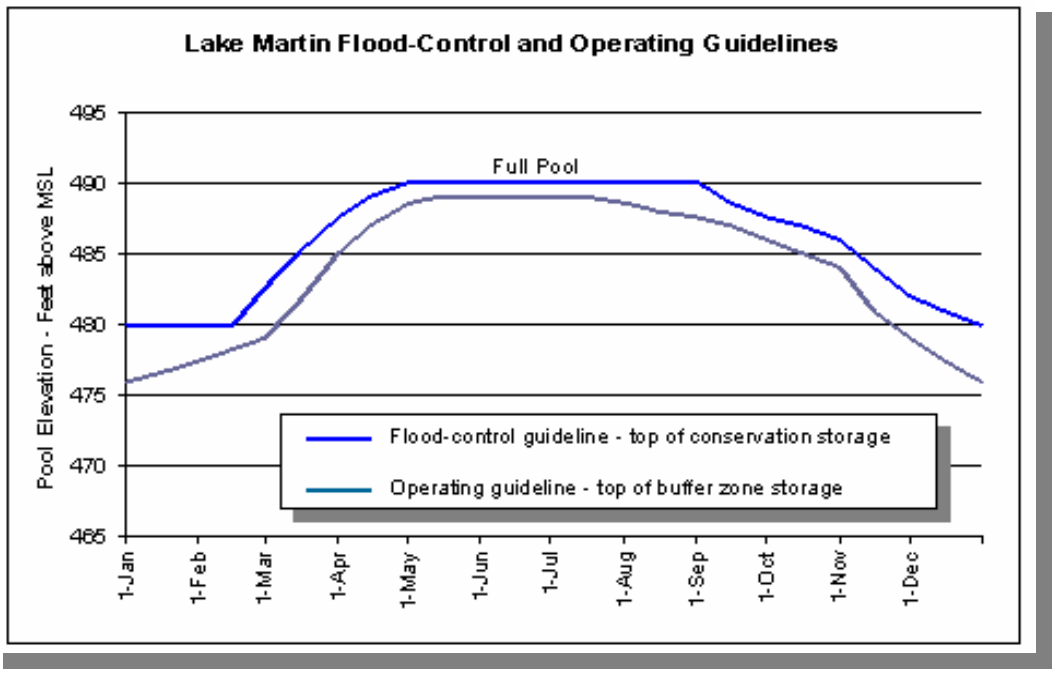
Exhibit 5-1
MiddleTallapoosa Watershed
Tallapoosa River Basin Management Plan

EXHIBIT 5-2
Martin Reservoir Dam
Tallapoosa River Basin Management Plan

(Photo Source: Alabama Power Company)

EXHIBIT 5-3
Lake Martin Flood Control and Operating Guidelines
Tallapoosa River Basin Management Plan



requirements during drier weather. Winter pool levels are lower to meet flood control requirements during the time of year when rainfall amounts typically are higher.

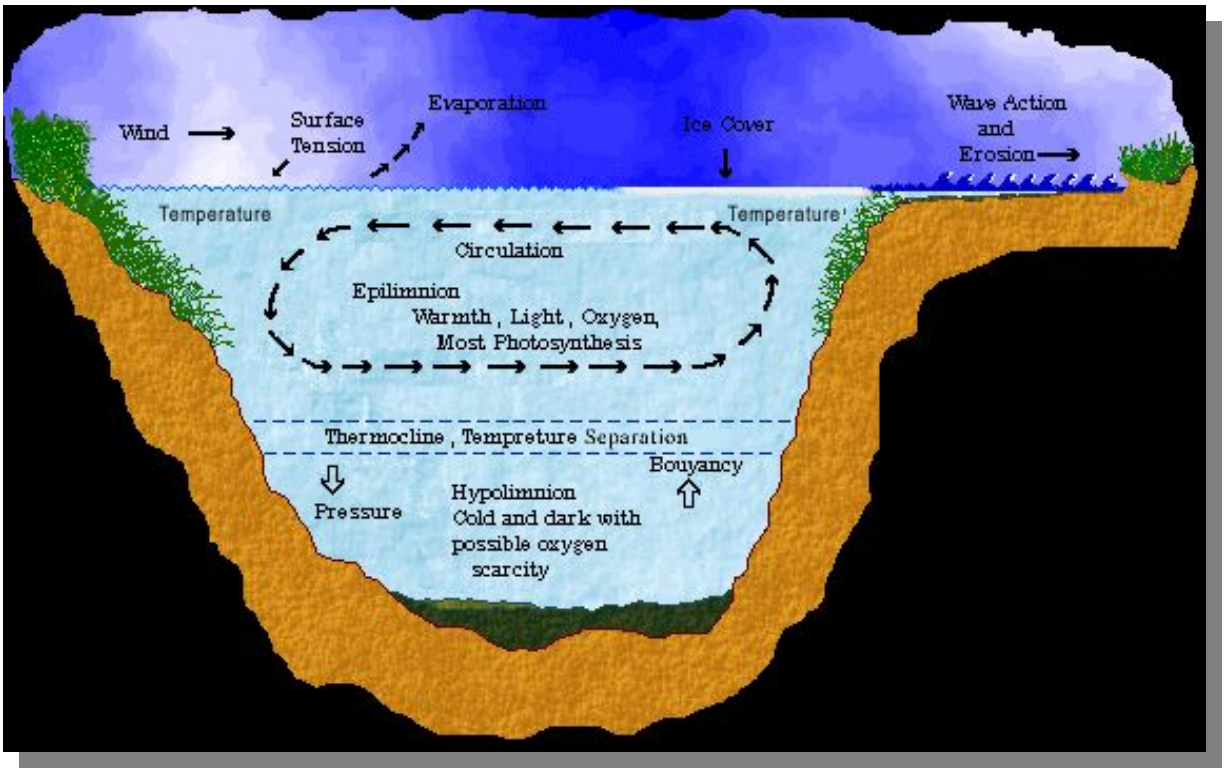
Because Martin is a peaking hydroelectric plant, it usually operates Monday through Friday to meet peak power demands. Even though the loads placed on the system usually maintain the reservoir near the top of the conservation pool, the full range of storage above the operating guideline is available for power generation to meet market demand. In addition, although this reservoir does not have storage reserved for flood control, APCo coordinates the operation of Martin with other projects on the Tallapoosa River and Coosa River systems in the interest of flood control. During periods of high inflows or flood conditions, the power plant operates as necessary to keep the lake from exceeding the designated full-pool elevation (COE, September 1998).

Recently, APCo refurbished and upgraded the three original units of the four turbine generator units at the Martin Dam Powerhouse. The upgrades increased the dam's hydraulic capacity for power generation by 900 cfs, or 8.6 percent. The resulting increase in power generation capacity allows for peaking operations of shorter duration. This additional capacity facilitates the attainment of power output objectives using less water, thereby lessening the potential effects on other water uses and lake pool levels, especially during the summer-fall season drought periods.

The lake's physical characteristics, combined with seasonal changes in lake level and hydro-peaking operations, play an important role regarding variations in water quality and aquatic habitat around the lake. This relatively deep lake undergoes thermal stratification each summer, creating an upper layer, or epilimnion, of relatively warm, well-mixed water (Exhibit 5-4). Below this layer or zone, temperature decreases with depth in a zone referred to as the thermocline or metalimnion. The layer of water below the thermocline that typically is uniformly the coldest and possesses the highest density is the hypolimnion. DO concentration levels in the hypolimnion typically are low (about 2 mg/L), causing anaerobic conditions that are not biologically productive for fish-food organisms or fish. This is a natural occurrence in deep lakes and not a sign of impairment. Most game and commercial species of fish avoid anaerobic waters (Alabama Fisheries Association [AFA], 1999). For the shallower tributary embayments around the lake, the effects of summertime thermal stratification on the physical, chemical, and biological properties of water are substantially less compared to what occurs in the deeper areas of the lake along its main channel and dam forebay.

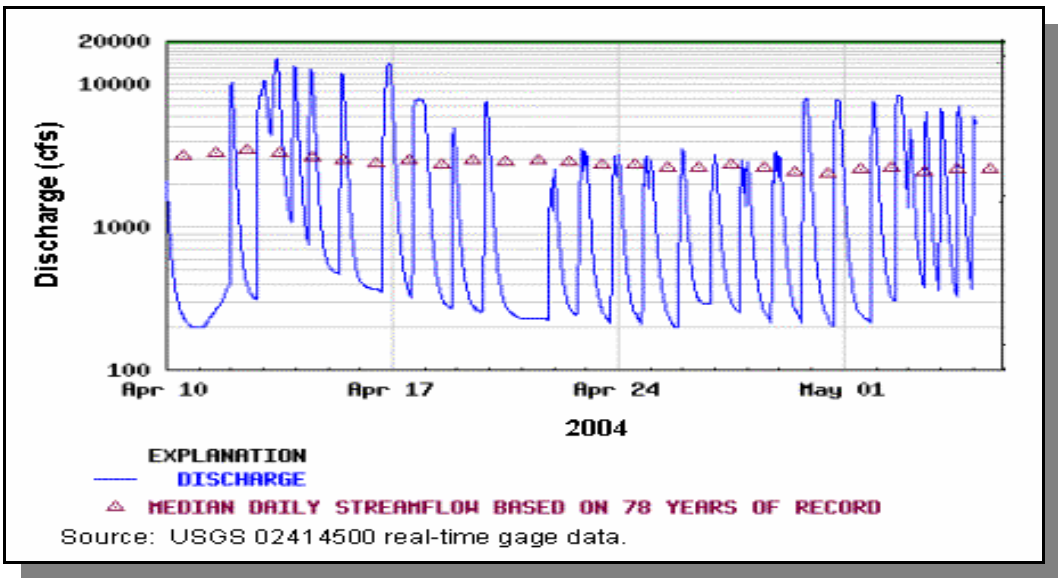
Approximately half of Martin's 3,000-square-mile watershed (which includes the Middle, Upper, and Headwater [Georgia portion] Tallapoosa watersheds) drains to R. L. Harris Dam and is controlled or regulated by dam operations upriver at the reservoir. In effect, Lake Wedowee helps attenuate pollutant loading and the destructive flood effects on the water quality and affected habitats in this section along the Tallapoosa River and at Lake Martin. Also, as a consequence of hydro-peaking operations at Harris Dam, the down-river segment is subject to large daily and hourly fluctuations in discharge or flow levels, especially for the portion of this reach nearest to the dam. The effect of these fluctuations is experienced for several miles downstream from Harris, as reflected in the discharge records at the USGS gauge station located at Wadley on the Tallapoosa, 13.7 miles down river (Exhibit 5-5).

EXHIBIT 5-4
Epilimnion, Thermocline, and Hypolimnion Layers in a Stratified Lake
Tallapoosa River Basin Management Plan



Source: www.broadwaters.fsnet.co.uk/physical.htm

EXHIBIT 5-5
Hydro-peaking Flow Effects at Wadley, Tallapoosa River
Tallapoosa River Basin Management Plan



These fluctuations in flow affect native biota and their aquatic and riparian habitats, channel stability, local flooding, and recreational uses. Stakeholders currently are addressing these issues through an adaptive management process. Through this process, stakeholders are exploring innovative river management approaches to protect riverine biotic integrity and to accommodate other stakeholders' needs. Dr. Elise Irwin of USGS's Alabama Cooperative Fish and Wildlife Research Unit at Auburn University is spearheading this effort with APCo's assistance (Irwin and Freeman, 2001).

As noted in Section 2 of this Plan, the vast majority (84.4 percent) of the land in the Middle Tallapoosa is forested. Agriculture, which is primarily devoted to pastureland, accounts for only 8.4 percent of the land cover. It is expected that the ongoing trend of existing row crop and pastureland being converted to pine forest silviculture will continue in response to the market for wood products. Only 1.1 percent is associated with the residential and commercial land cover typical of urban areas.

The predominately rural setting of mainly forest cover provides favorable conditions for good water quality and healthy aquatic and riparian habitats. In general, water quality and habitat integrity measures remain within the use classification standards throughout the Middle Tallapoosa Watershed. Exceptions to this generalization and specific concerns are discussed later.

Alexander City, located on U.S. Highway 280 adjacent to the northwestern portion of Lake Martin, is the largest community in the Middle Tallapoosa Watershed. This urban area consists of a variety of industrial, commercial, and residential land uses that could affect the quality and integrity of streams in the watershed. With a population of more than 15,000, it is the only city in this watershed with a population greater than 10,000. The City of Roanoke's population was 6,563 in 2000; it is the only other city in the Middle Tallapoosa with 5,000 or more persons. Other smaller communities in this watershed such as Ashland, Dadeville, Lafayette, and Lineville also have relatively low density commercial and residential lands uses and commensurately lower potentials for point source and NPS pollution in their respective subwatersheds.

The most significant residential and commercial growth that has a direct effect on water quality in this watershed is the shoreline development around Lake Martin. The lake's location, water quality, and recreation potential have attracted development. Improved accessibility to nearby urban areas, an influx of affluent retirees, and more time and resources devoted to water-based leisure activities are transforming the lake's shoreline from one of summer-time fish camps and lake cabins to upscale developments for full-time residents and second, seasonal homes for residents of the Birmingham, Montgomery, and Atlanta metropolitan areas. Also nearby is the Horseshoe Bend Military National Park on the Tallapoosa River and Wind Creek State Park on Lake Martin. These local parks are important draws for tourism and acquaint visitors with the many and varied recreation activities afforded by the excellent water resources in the Middle Tallapoosa. This trend is expected to continue for the foreseeable future.

Ongoing efforts to widen U.S. Highways 280 and 431 to four lanes will enhance highway access to the watershed and induce greater north/south traffic through the subbasin, especially from Birmingham to Auburn-Opelika. The relative driving convenience to this watershed from Montgomery, Auburn-Opelika, Birmingham, and Atlanta and the rural

charm of the area contribute to the gradual encroachment of urban and suburban development along the Middle Tallapoosa's outer margins.

Water Quality and Biological Data and Analyses

Exhibit 5-6 lists the sources of water quality and biological data and analyses for the Middle Tallapoosa Watershed. Data and analyses from these agencies were used to populate the Middle Tallapoosa CWP Dataviewer (www.cleanwaterpartnership.org/middletallapoosa), as well as to guide stakeholders in an assessment of water quality and biological concerns. For the purposes of this plan, recent water quality data (5 years old or less) and related reports on water quality, biota, and habitat for the Middle Tallapoosa were obtained, mainly from ADEM, AWW, and USGS.

EXHIBIT 5-6
Water Quality and Biological Data in the Middle Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Agency	Period of Record	Project/Report Name	Data Type
ADCNR	1995 - 2001	Martin Reservoir Management Reports (annual)	Biological, habitat
ADCNR	1996 - 2002	Bass Anglers Information Team Annual Report (B.A.I.T.)	Biological
ADEM	1997	Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997	Chemical, physical, biological
ADEM	2000	Screening Assessment of the Tallapoosa River Basin–2000	Chemical, habitat, biological
ADEM	2000	§303(d) Water body Monitoring Project	Chemical, habitat, biological
ADEM	1997 – 2000	Alabama Monitoring and Assessment Program (ALAMAP)	Chemical, physical, habitat
ADEM	2000 – 2003	Alabama 2002 & 2004 Water Quality Report to Congress [Clean Water Act § 305(b) Report]	Chemical, physical, biological, habitat
ADPH	2003	Fish Consumption Advisories	Fish
Auburn University	2002 - 2003	Selected lake sampling for Alexander City	Chemical, physical, biological
AWW	1993 – 2004	Lake Watch of Lake Martin citizen monitoring data and Lake Martin Report (February 2000); Lake Wedowee Property Owners Association citizen monitoring data and Lake Wedowee Report (June 2003)	Chemical, physical
GSA		Groundwater data	Chemical, bacteriological, physical
SWCD	1998	County Watershed Assessments	Watershed
USGS	1999 - 2002	02414500–Tallapoosa River at Wadley, Alabama	Chemical, flow

EXHIBIT 5-6
Water Quality and Biological Data in the Middle Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Agency	Period of Record	Project/Report Name	Data Type
USGS	1999 - 2002	02414525–High Pine Creek near Roanoke, Alabama	Chemical, flow
USGS	1999 - 2002	02414715–Tallapoosa River at New Site, Alabama (Horseshoe Bend)	Chemical, flow
USGS	1999 - 2002	02415000–Hillabee Creek near Hackneyville, Alabama	Chemical, flow
USGS	1999 - 2002	02416035–Sugar Creek near Alexander City, Alabama	Chemical

Notes:
ADCNR = Alabama Department of Conservation and Natural Resources
ADPH = Alabama Department of Public Health
ADEM = Alabama Department of Environmental Management
AWW = Alabama Water Watch
AU Fisheries = Auburn University Fisheries Department
GSA = Geological Survey of Alabama
SWCD = Soil and Water Conservation District
USGS = U.S. Geological Survey

Surface Water Quality Screening Assessment

The results from the *Surface Water Quality Screening Assessment of the Tallapoosa River Basin–2000* (ADEM, 2000) rated the overall potential for NPS impairment in this watershed as low, based on estimates of sedimentation rates, animal unit densities, and pastureland. None of the subwatersheds was estimated to have a high potential for impairment from NPSs, and only 12 were estimated to have a moderate potential for impairment. One subwatershed, Cornhouse Creek (03150109040), was listed as a priority NPS-affected watershed because of a "fair" assessment caused by erosion and sedimentation from silvicultural practices (ADEM, September 2001).

Middle Tallapoosa Reservoir Studies

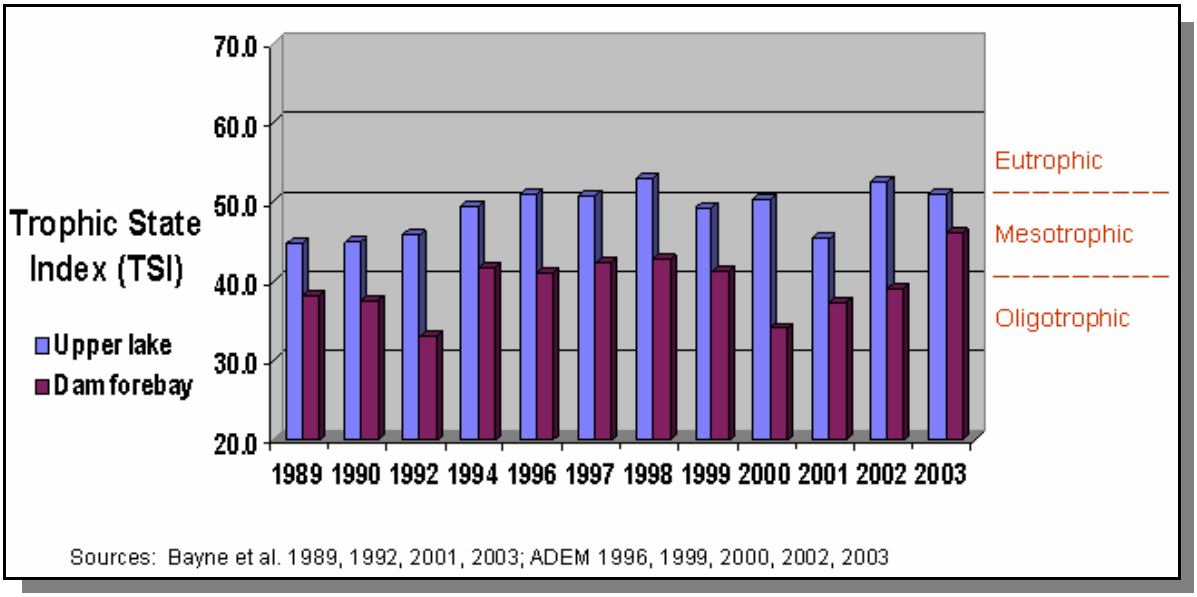
ADEM monitors water quality in Lake Martin and the subwatersheds in the Middle Tallapoosa through the Reservoir Water Quality Monitoring Program (RWQMP) and Alabama Monitoring and Assessment Program (ALAMAP). Monitoring for Lake Martin is conducted on a periodic rotating schedule, with emphasis on the April through October growing season for phytoplankton. Assessing the effects of nutrient enrichment and eutrophication in Alabama lakes has become an important aspect of ADEM's lake and reservoir monitoring efforts.

Measuring chlorophyll *a* concentrations is considered to render the best estimate of the biotic response of lakes to nutrient enrichment when phytoplankton (plankton algae) is the dominant plant community. These measurements estimate the amount, or biomass, of phytoplankton in the water. ADEM promulgated a lake-specific standard for the chlorophyll *a* concentration for Lake Martin in 2002. The standard is 5 micrograms per liter (µg/L) or less, computed as the April through October growing season mean for samples measured from the deepest point in the main stem of the dam forebay, the main river

channel immediately upstream of Blue Creek embayment, and the main creek waterway immediately upstream of Alabama Highway 63 (Kowaliga) bridge.

On the basis of monitoring data from the RWQMP, ADEM has classified Lake Martin as mesotrophic (moderate nutrients and significant productivity) overall. However, data for the upper portion of the lake in the main channel illustrate a general trend of typically higher concentrations of chlorophyll *a* and higher equivalent TSI values than in the lower lake sampling stations during the April through October growing season for plankton algae. This trend is due, in large part, to the proximity of point sources and NPSs of nutrient enrichment from the majority of upstream subwatersheds within the Upper Tallapoosa Watershed (Exhibit 5-7).

EXHIBIT 5-7
Lake Martin Trophic State
Tallapoosa River Basin Management Plan



Additionally, for both the lower lake and upper lake, the year-over-year TSI values suggest that the trophic state for these areas of the lake indicate a gradual but general trend of eutrophication. The lower lake has trended from an oligotrophic to mesotrophic state and the upper lake is trending toward a eutrophic state. Note also that Exhibit 5-7 illustrates the effect of drought conditions on nutrient loading from NPSs and the resulting eutrophication effects, as evidenced during 2000 and 2001. In general, extended periods of low surface water runoff result in lower loads of sediment and nutrient enrichment. These significant water quality trends are described further in the watershed assessment section.

Alabama Water Watch Program

Since 1993, Lake Watch of Lake Martin (LWLM), the pioneer volunteer citizen-monitoring group of the AWW program, has conducted water tests on selected physical and chemical water quality variables at 34 sites on Lake Martin, the Tallapoosa River, and other lake tributaries. Currently, Lake Watch members monitor 8 lake sites on a monthly basis.

Conclusions from these water quality monitoring records are contained in a 2003 report, *Citizen Volunteer Water Quality Monitoring of Alabama's Reservoirs, Lake Martin* (Deutsch, February 2000). These data and supplemental information are available to the public via the AWW website, www.alabamawaterwatch.org/, in addition to being available through the Middle Tallapoosa CWP Dataviewer (www.cleanwaterpartnership.org/middletallapoosa).

During 2004 and 2005, LWLM will participate in an intensive monitoring program to study the effects of nutrient loadings in Lake Martin and Lake Wedowee as part of the U.S. Department of Agriculture (USDA)-funded Tallapoosa Watershed Project (TWP). The TWP is described further in the monitoring and education outreach portions of this plan.

Fish Tissue Surveys

Finally, ADEM conduct annual fish tissue sample surveys in lakes and rivers across the state. The samples are analyzed for the presence of toxic substances. The results from these analyses are used as the basis for the fish consumption advisories issued by ADEM. In FY 2000, ADEM conducted surveys on Lake Martin. No fish consumption advisories were issued for Lake Martin or the Tallapoosa River based on those surveys (ADEM 305b Reports, 2002, 2004).

Alabama Report to Congress

ADEM's 2004 §305(b) Report to Congress states that Martin Reservoir is mesotrophic, based on the mean TSI values collected in August and September 1985 through the present in the dam forebay. Martin Reservoir is fully supporting its water use classifications.

USGS Data

Data were obtained from the following USGS stations: 02414525 (Tallapoosa River at Wadley, Alabama), 02414525 (High Pine Creek near Roanoke, Alabama), Tallapoosa River at New Site, Alabama [Horseshoe Bend]), 02415000 (Hillabee Creek near Hackneyville, Alabama), and 02416035 (Sugar Creek near Alexander City, Alabama). The parameters consisted of flow, temperature, specific conductivity, discharge, DO, chemical oxygen demand, pH, carbonates, hardness, nutrients, metals, bacteria, and solids. Data collection began as early as 1923 and as late as 1999, and real time flow continues to be collected. None of the USGS data indicate water quality impairments.

Biotic Species Information

The Tallapoosa River, its tributaries, and Lake Martin are essential elements of a diverse regional habitat that supports a rich diversity of biota, including several T&E species of plants and animals. There are 119 different species of fishes native to the waters of the Middle Tallapoosa Watershed. The 50-mile reach of the Tallapoosa River between Harris Dam and the headwaters of Lake Martin is an important river habitat. Before the construction of Harris Dam in the 1980s, this section of river supported productive fisheries for spotted bass, redeye bass, and flathead catfish. More than 60 fish are known from this reach of the Tallapoosa, including at least 4 fish endemic to the Tallapoosa system (lipstick darter, Tallapoosa darter, Tallapoosa shiner, and mottled sculpin) (Freeman, Nestler, and Johnson, 1997). In addition, shoals near the headwaters of Lake Martin on the Tallapoosa

River (Griffin Shoals) contain stands of the shoal lily (*Hymenocallis sp*.) found in the Middle section of the Tallapoosa Basin.

According to the FWS, there are five species listed as either endangered or threatened and one candidate species for listing in the Middle Tallapoosa Watershed (Exhibit 5-8). Two species (little amphianthus plant and fine-lined pocketbook mussel) live in aquatic environments. Exhibit 5-9 illustrates some of the species unique to the Middle Tallapoosa Watershed.

EXHIBIT 5-8
Threatened, Endangered, and Candidate Species
Tallapoosa River Basin Management Plan

Species Common Name	Scientific Name	Designation
Fine-lined pocketbook mussel	*Lampsilis altilis*	Endangered
Little amphianthus	*Amphianthus pusillus*	Threatened
Relict Trillium	*Trillium reliquum*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Endangered
White fringeless orchid	*Platanthera integrilabia*	Candidate Species

EXHIBIT 5-9
Examples of Protected Species and Others Unique to the Middle Tallapoosa Watershed
Tallapoosa River Basin Management Plan


Fine-line pocketbook mussel


Little Amphianthus plant


Shoal lily


Lipstick darter


Tallapoosa darter


Tallapoosa shiner

(Photo Sources: USGS; Lake Watch of Lake Martin; and Mettee, O'Neil, and Pierson, Fishes of Alabama and the Mobile Basin, 1996)

Occupying 4 percent of the watershed in the Middle Tallapoosa, Lake Martin is an important habitat for a wide variety of plants and animals. The Fisheries Section of the ADCNR has conducted periodic inventories of fish populations in Lake Martin. Reservoir management reports of these inventories provide detailed accounts of fish populations, species diversity, growth trends, recruitment, and mortality. These reports also identify problems to assist in determining appropriate management strategies to sustain and enhance the fishery, as necessary.

The fish resource of Lake Martin consists of a diverse assemblage of warm water species. According to the 2000 to 2001 management report, a total of 18 species of fish were identified in the lake. Game species found included largemouth bass, spotted bass, white bass, black crappie, and bluegill. Spotted bass, with lesser numbers of largemouth bass, dominate the bass population. Crappie abundance is moderate. Striped bass are stocked in moderate numbers to provide an additional game fishery.

Other species found to inhabit the lake include redear sunfish, green sunfish, redbreast sunfish, gizzard shad, threadfin shad, channel and flathead catfish, common carp, spotted sucker, blacktail shiner, and blacktail redhorse. The survey information is supplemented by bass tournament information collected through the B.A.I.T. Lake Martin attracts several large bass tournaments during the fall, winter, and spring. The B.A.I.T. reports indicate that the lake ranks high in the number of fish caught per angler-day, because of the high abundance of spotted bass (ADCNR, September 2001). According to B.A.I.T. tournament reports for 23 Alabama reservoirs in 2002, Martin ranked second behind Weiss Lake according to percent catch success for tournament participants (B.A.I.T., 2002).

Although invasive species of aquatic or riparian plants or animals are a potential threat to the biotic integrity of native species, no notable impairment has occurred in the Middle Tallapoosa subwatersheds or Lake Martin. However, as tourism and water-based recreation continue to grow in the area, the potential for the introduction of invasive and nuisance weeds or animals will likewise increase. If not properly cleaned, boats of visitors to the area can introduce seeds, larvae, or fully formed plants or animals not native to the Middle Tallapoosa's environs. Over time, the resulting ecosystem effects could be minimal to devastating, depending on the type of species introduced. The high number of bass tournaments that draw participants from all parts of the United States and Canada is one example where species, such as the zebra mussel, could inadvertently be introduced if appropriate protective measures are not taken to minimize the threat.

Watershed Assessment

An assessment was made of water quality and biological concerns for the subwatersheds in the Middle Tallapoosa Watershed. Sources of empirical data and existing analyses are listed in Exhibit 5-6. Stakeholders provided additional input during Middle Tallapoosa CWP meetings held from July 2003 through July 2004. Although it was mostly anecdotal, the stakeholder input provided timely insights from both environmental professionals and local citizens who are familiar with potential causes and sources of water quality and biological concerns in this watershed. For each concern identified, a potential source(s) was determined and a priority ranking established.

Only one stream segment in the Middle Tallapoosa Watershed, Sugar Creek, currently is listed on the state's Draft 2004 §303(d) List (Appendix B) for not meeting water quality standards for its prescribed F&W use classification (Exhibit 5-10).

EXHIBIT 5-10
Middle Tallapoosa Impaired Water Body from the Draft §303(d) List for Alabama
Tallapoosa River Basin Management Plan

Water Body Name	Causes	Sources	TMDL Status
Sugar Creek (Elkahatchee Creek subwatershed)	Nutrients Chlorides	Municipal	TMDL (2004)

Notes:
TMDL = total maximum daily load
Source: ADEM Draft 2004 §303(d) list

Water Quality and Biological Concerns

Observations by stakeholders who have a local knowledge of watersheds, known issues that may become serious in the future, and other anecdotal information are considered when identifying potential water quality concerns. Potential concerns are listed in Exhibit 5-11. Typically, there are no water quality or biological data to support these concerns. However, in some instances, preliminary evidence of an emerging trend toward water quality or habitat degradation may be suggested by the existing monitoring data. Screening assessments from the ADEM and SWCD county watershed assessments were used as a foundation to develop Exhibit 5-11.

Elkahatchee Creek Subwatershed

Sugar Creek is located in Alexander City in the Elkahatchee Creek subwatershed. The impaired segment extends 4.8 miles from Elkahatchee Creek to Alexander City. Sugar Creek was placed on the §303(d) list in 1998 based on monitoring data for the period 1990 through 1996. The causes on the 1998 §303(d) listing are nutrients, chlorides, metals (copper), and color from a municipal source. In January 2001, the Sugar Creek WWTP outfall was moved from Sugar Creek to Lake Martin, approximately 2.5 miles south of the U.S. Highway 280 bridge. During the growing season of 2003 and 2004, the City of Alexander City monitored the water quality at selected sampling stations near the current outfall location. In 2003, EPA approved delisting Sugar Creek for copper and color based on favorable monitoring results for Sugar Creek since its initial listing.

According to EPA, "PCBs are mixtures of synthetic organic chemicals. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. More than 1.5 billion pounds of PCBs were manufactured in the United States prior to cessation of production in 1977" (EPA, 2004, www.epa.gov/opptintr/pcb/).

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Beaverdam Creek	Siltation	Gullies Dirt roads/roadbanks Stream banks Silviculture	No	High
Beaverdam Creek	Pathogen contamination	Poultry Septic tanks	No	Medium
Beaverdam Creek	Flooding and erosion	Tallapoosa River Riverbank modification and destabilization	No	Medium
Beaverdam Creek	Nutrient enrichment	Poultry Septic tanks Pastureland	No	Medium
Beaverdam Creek	Other	Illegal dumping	No	Low
Blue Creek	Siltation	Pastureland Dirt roads/roadbanks Flooding Urban development Livestock Gullies Streambanks Silviculture Lakeshore residential development	No	Medium
Blue Creek	Nutrient enrichment	Pastureland Silviculture Wastewater land application Septic tanks	No	High
Blue Creek	Pathogen contamination	Pastureland Septic tanks	No	High
Blue Creek	Other	Illegal dumping	No	Medium
Chatahopsee Creek	Siltation	Silviculture Pastureland Dirt road/roadbanks Urban development	No	High
Chatahopsee Creek	Nutrient enrichment	Silviculture Pastureland Dirt road/roadbanks Urban runoff Septic tanks WWTP WTP	No	Medium

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Chatahopsee Creek	Pathogen contamination	Pastureland Septic tanks WWTP WTP	No	Medium
Chatahopsee Creek	Other	Illegal dumping	No	Low
Chikasonoxee Creek	Siltation	Silviculture Dirt roads/roadbanks	No	Medium
Chikasonoxee Creek	Nutrient enrichment	Pastureland Cropland Septic tanks Animal waste	No	Low
Chikasonoxee Creek	Pathogen contamination	Septic tanks	No	Medium
Cornhouse Creek	Nutrient enrichment	Animal waste Pastureland Septic tanks	No	Medium
Cornhouse Creek	Pathogen contamination	Animal waste Septic tanks Pastureland	No	Medium
Cornhouse Creek	Siltation	Gullies Dirt roads/roadbanks Streambanks	No	High
County Line Creek	Siltation	Silviculture Pastureland	No	Medium
County Line Creek	Nutrients	Pastureland Septic tanks	No	Low
County Line Creek	Pathogen contamination	Pastureland Septic tanks	No	Low
County Line Creek	Other	Illegal dumping	No	Low
Crooked Creek	Siltation	Dirt roads/roadbanks Stream banks Silviculture	No	Medium
Crooked Creek	Pathogen contamination	Animal waste Poultry AFO, slaughtering, and processing plant WWTP lagoon Livestock Filter plant Septic tanks	No	Medium

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Crooked Creek	Nutrient enrichment	Animal waste Urban runoff Poultry WWTP lagoon Livestock Filter plant Septic tanks	No	Medium
Elkahatchee Creek	Nutrient enrichment (areas other than Sugar Creek)	WWTP (2) Filter plants (2) Septic tanks	Yes	High
Elkahatchee Creek	Pesticides	Unknown/legacy	Yes	High
Elkahatchee Creek	PCBs	Unknown/legacy	Yes	Low
Elkahatchee Creek	Potential carcinogens	Unknown/legacy	Yes	Low
Elkahatchee Creek	Specific conductance	WWTP (2)	Yes	High
Elkahatchee Creek	Lake trophic state (Chlorophyll *a* concentration)	Nonpoint source nutrients from upstream subwatersheds WWTP (2) Filter plants (2)	Yes	High
Elkahatchee Creek	Siltation	Urban storm water runoff Development	No	Medium
Elkahatchee Creek	Lake turbidity (inorganic)	Lakebed/shoreline erosion during pool draw-down period	No	Low
Elkahatchee Creek	Pathogen contamination	Septic tanks	No	High
Elkahatchee Creek	Other	Illegal dumping	No	Low
Elkahatchee Creek	Other	Littering	No	High
Emuckfaw Creek	Siltation	Silviculture Dirt roads/roadbanks	No	Medium
Emuckfaw Creek	Nutrient enrichment	Silviculture Dirt roads/roadbanks Livestock Septic tanks	No	Medium
Emuckfaw Creek	Other	Illegal dumping	No	Low
Emuckfaw Creek	Pathogen contamination	Pastureland/septic tanks	No	Medium
Enitachopco Creek	Siltation	Dirt roads/roadbanks Gullies Urban development Pastureland Silviculture	No	High

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Enitachopco Creek	Pathogen contamination	Animal waste Livestock Poultry Septic tanks	No	Medium
Enitachopco Creek	Nutrient enrichment	Animal waste Livestock Poultry Septic tanks	No	Medium
Enitachopco Creek	Other	Illegal dumping	No	Low
Fox Creek	Siltation	Dirt road/roadbanks Gullies Streambanks	No	Medium
Fox Creek	Other	Illegal dumping	No	Low
Fox Creek	Pathogen contamination	Animal waste Livestock Septic tanks	No	Medium
Fox Creek	Nutrient enrichment	Animal waste Livestock Septic tanks	No	Medium
High Pine Creek	Siltation	Silviculture Gullies Dirt roads/roadbanks	No	High
High Pine Creek	Nutrient enrichment	Silviculture Urban development Animal waste Livestock Filter plant WWTP lagoon	No	High
High Pine Creek	Pathogen contamination	WWTP lagoon Animal waste Livestock	No	High
High Pine Creek	Pesticides	Mixed agriculture	No	High
High Pine Creek	Flooding	Naturally occurring	No	High
Hillabee Creek	Siltation	Silviculture	No	High
Hillabee Creek	Siltation	Dirt roads/roadbanks Powerline right-of-way Industrial site development	No	Medium
Hillabee Creek	Nutrient enrichment	Silviculture Livestock Urban/development Septic tanks	No	Medium
Hillabee Creek	Other	Illegal dumping	No	Medium

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Hillabee Creek	Pathogen contamination	Livestock Septic tanks	No	Medium
Hillabee Creek	Habitat alteration	Silviculture	Yes	Medium
Hodnett Mill Creek	Siltation	Silviculture Agricultural land Streambanks Dirt roads/roadbanks	No	High
Hodnett Mill Creek	Nutrient enrichment	Pastureland Septic tanks	No	Medium
Hodnett Mill Creek	Pathogen contamination	Septic tanks	No	Low
Hodnett Mill Creek	Other	Illegal dumping	No	Low
Hurricane Creek	River flow fluctuation, erosion, and flooding	Hydropower peaking operations (dam) Flood control releases	No	High
Hurricane Creek	Siltation	Dirt roads/roadbanks Gullies Surface mining	No	High
Hurricane Creek	Nutrient enrichment	Poultry Urban runoff WWTP lagoon Pastureland	No	Medium
Hurricane Creek	Pathogen contamination	Poultry Urban runoff WWTP lagoon Pastureland	No	Medium
Little Hillabee Creek	Siltation	Dirt roads/roadbanks Powerline right-of-way Silviculture Cropland Gullies	No	Medium
Little Hillabee Creek	Pathogen contamination	Animal waste Septic tanks Livestock	No	Medium
Little Hillabee Creek	Nutrient enrichment	Animal waste Septic tanks Livestock	No	Medium
Little Hillabee Creek	Other	Illegal dumping	No	Low

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Oakachoy Creek	Siltation	Urban development Surface mining Dirt roads/roadbanks Gullies Silviculture Shoreline development	No	Medium
Oakachoy Creek	Nutrient enrichment	Septic tanks Houseboats	No	High
Oakachoy Creek	Pathogen contamination	Septic tanks Houseboats	No	High
Oakachoy Creek	Other	Illegal dumping	No	Medium
Sandy Creek	Siltation and lake turbidity	Dirt road/roadbanks Silviculture Cropland Livestock Highway construction Industrial site development Urban runoff	No	High
Sandy Creek	Lake turbidity (inorganic)	Lakebed / shoreline erosion during draw-down period	No	Medium
Sandy Creek	Nutrient enrichment	Silviculture Pastureland WWTP lagoon Septic tanks	No	High
Sandy Creek	Lake trophic state (Chlorophyll *a* concentration)	NPS nutrients WWTP WWTP lagoon	No	Medium
Sandy Creek	Pathogen contamination	WWTP (SSOs) Septic tanks Lagoon	No	High
Sandy Creek	Lake habitat	Invasive species (floral and faunal) Seasonal lake pool-level changes/ lakebed and shoreline erosion Species predation	No	Low
Sandy Creek	Other	Illegal dumping	No	High
Sweetwater Creek	Siltation	Surface mining silviculture Urban/suburban development Dirt road/roadbanks	No	High
Sweetwater Creek	Nutrient enrichment	Urban/suburban development Livestock	No	Medium

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Sweetwater Creek	Pathogen contamination	Pastureland Urban runoff	No	Low
Tallapoosa River (180)	Siltation	Silviculture Dirt roads/roadbanks Residential development Highway construction	No	High
Tallapoosa River (180)	Lake turbidity inorganic (clay turbidity)	Lakebed/shoreline erosion during draw-down period	No	Medium
Tallapoosa River (180)	Nutrient enrichment	Silviculture Dirt roads/roadbanks Residential development Highway construction Septic tanks Livestock Houseboats	No	High
Tallapoosa River (180)	Lake trophic state (Chlorophyll *a* concentration)	NPS nutrients from upstream subwatersheds PS nutrients from WWTP (2)	No	High
Tallapoosa River (180)	Lake habitat	Invasive species (floral and faunal) Seasonal lake pool-level changes Fish species predation	No	Low
Tallapoosa River (180)	Other	Illegal dumping	No	Medium
Tallapoosa River (180)	Other	Litter	No	High
Tallapoosa River (180)	Pathogen contamination	Septic tanks Houseboats Livestock	No	High
Tallapoosa River (below Lake Wedowee) (020)	River flow fluctuation, erosion, flooding, and habitat integrity	Hydropower peaking operations (dam) Flood control releases	No	High
Tallapoosa River (below Lake Wedowee) (020)	Siltation	Gullies Dirt roads/roadbanks Silviculture	No	High
Tallapoosa River (below Lake Wedowee) (020)	Nutrient enrichment	Livestock Septic tanks	No	Low
Tallapoosa River (below Lake Wedowee) (020)	Pathogen contamination	Livestock Septic tanks	No	Low
Timbergut Creek	Siltation	Silviculture Powerline right-of-way Dirt roads/roadbanks	No	Medium

EXHIBIT 5-11
Middle Tallapoosa Watershed Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Data	Priority
Timbergut Creek	Nutrient enrichment	Cropland Pastureland Animal waste	No	Low
Timbergut Creek	Pathogen contamination	Animal waste Pastureland	No	Low
Timbergut Creek	Other	Illegal dumping	No	Low

Notes:
AFO = animal feeding operation
WTP = water treatment plant
WWTP = wastewater treatment plant
NPS = nonpoint source
PS = point source
SSO = sanitary sewer overflow
PCB = polychlorinated biphenyl

Also in 2003, ADEM analyzed sediment in the Sugar Creek and Elkahatchee Creek area and reported trace amounts of the following pesticides or potential carcinogens: 4,4'-dichloro-diphenyldichloroethane (DDD), 4,4'-dichlorodiphenyl-trichloroethane (DDT), Arochlor 1260, polychlorinated biphenyls (PCBs), and dichlorophenoxyacetic acid (2,4-D). Fish tissue samples from ADEM and EPA are pending. Some of these pollutants are from historic sources, and are no longer used. In addition, ADEM indicated in its 2002 CWA §305(b) Report that nutrient enrichment, particularly phosphorus, is a pollutant of concern for the upper portion of Lake Martin. Nearly 90 percent of the lake's 3,000-square-mile watershed drains via the Tallapoosa River main stem to the upper third of the lake encompassed by the Elkahatchee Creek and Tallapoosa River subwatersheds. During the April to October growing season for phytoplankton, the effects of nutrient enrichment from polluted runoff and WWTP discharges into the lake are indicated most readily by the increased chlorophyll *a* concentrations measured in the upper lake embayments of Coley Creek and Elkahatchee Creek.

During 2000, the chlorophyll *a* growing season means for the Coley Creek and Elkahatchee Creek monitoring stations were 31.2 µg/L and 18.9 µg/L, respectively, indicating that these waters were in a eutrophic state. These levels were considerably higher than those measured upstream of Coley Creek on the main stem of the Tallapoosa River (6.2 µg/L) and for the lower lake stations (1.6 µg/L). A portion of these elevated chlorophyll *a* concentrations can be attributed to the hydrodynamics; as water slows as it reaches the embayments, algal production will occur. However, the concentrations in the Coley and Elkahatchee Creek embayments are indicative of high nutrient loads and probably are attributable to enrichment from nearby WWTP discharges, as well as to nonpoint sources of nutrients within the subwatersheds.

From 2003 through 2004, the City of Alexander City partnered with Auburn University to monitor the water quality of Lake Martin near the diffuser outfall. Exhibit 5-12 lists the chlorophyll *a* growing season average at various sampling points. These data demonstrate decreased chlorophyll *a* concentrations over a 2-year growing season. Chlorophyll concentrations are an indicator of phytoplankton abundance and biomass. They can be an effective measure of trophic status and commonly are used as a measure of water quality. High levels often indicate poor water quality and low levels often suggest good conditions. Monitoring should continue in the lake to evaluate whether this trend toward decreased nutrient enrichment continues. The lake chlorophyll *a* criteria established by ADEM for the dam forebay and for the Blue Creek Embayment are both 5 µg/L. The criteria for the remainder of the lake have not been set yet.

EXHIBIT 5-12
Chlorophyll *a* Results from Sugar Creek Outfall Monitoring, 2003 to 2004
Tallapoosa River Basin Management Plan

Sampling Location	Sampling Year	Chlorophyll *a* Growing Season Average (µg/L)
Tallapoosa River 1 mile downstream of diffuser	2003	7.17
Tallapoosa River 750 feet downstream of diffuser	2003	7.25
Tallapoosa River at U.S. Hwy 280	2003	7.03
Wind Creek Embayment	2003	7.08
Elkahatchee Creek Embayment	2003	7.93
Dennis Creek Embayment	2003	6.10
Tallapoosa River 1 mile downstream of diffuser	2004	3.79
Tallapoosa River 750 feet downstream of diffuser	2004	4.63
Tallapoosa River at U.S. Hwy 280	2004	4.40
Wind Creek Embayment	2004	4.87
Elkahatchee Creek Embayment	2004	4.89
Dennis Creek Embayment	2004	4.48

Note:
µg/L = microgram per liter

Hillabee Creek Subwatershed

Oaktassi Creek, in the Hillabee Creek subwatershed, received a fair habitat rating based on in-stream habitat quality, sinuosity, and bank and vegetation stability.

Prioritized Watersheds

As Exhibit 5-11 indicates, the Middle Tallapoosa CWP stakeholders have prioritized each concern based on the §303(d) listing and TMDL status, severity of water quality or habitat degradation, and personal observations. The water quality and biological concerns ranked high are due to the §303(d) listing, substantiated degradation findings and trends needing immediate attention, recurring problems, and concerns that can easily be addressed. Concerns that are ranked medium are less immediate, more difficult to address, or have fewer data to support them. Low-priority concerns have no data to support them, are not a frequent problem, or could have been caused by drought or other naturally occurring conditions.

Watershed Management Strategies

Stakeholders have developed a list of watershed management strategies to guide water quality and aquatic habitat restoration and protection efforts. Exhibit 5-13 lists the management strategies for the NPS and point source pollution causes identified as water quality or biological concerns.

EXHIBIT 5-13
Middle Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
Nutrients	Obtain CEU credit for teachers attending watershed education programs
	Promote and expand ACWP nerdy-man PSAs and Legacy billboard advertisements
	Promote Forest Commission and NRCS BMP programs (EQIP)
	Apply for Section 319 grant funds where applicable.
	Encourage onsite system design, installation, and periodic service by qualified professionals
	Provide homeowner incentives to obtain onsite sewage system maintenance inspections and service (discount pump-out coupons)
	Promote public awareness of the effects of commercial fertilizers on affected streams and lakes
	Encourage proper use of fertilizers in residential and public areas (golf courses) through educational campaign
	Promote public awareness of lake effects during boater licensing and registration
	Promote conservation easements and use of stream-side management zones
	Support ”environmentally sensitive development” initiatives (ACES Community-based Restoration Initiative)

EXHIBIT 5-13
Middle Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
	Support initiatives for low-phosphorus and phosphorus-free soaps
	Construct rain garden demonstration projects (Alexander City)
	Support the development of a GIS model that will analyze the loading sources and effects to support management and education initiatives (TWP)
	Co-sponsor annual "State of the Watershed" conferences to foster CWP education and public awareness initiatives
	Advertise water quality training for master gardeners, local service groups and clubs, and developers and contractors
Pathogen contamination	Obtain CEU credit for teachers attending watershed education programs
	Promote BMP implementation initiatives (NRCS [EQIP], ACES, SWCC, ALDOT, ADEM [NPS Education Outreach])
	Advertise and enforce the Alabama Clean Marina Initiative (availability and use of marina pump-out facilities)
	Encourage potential homebuyers to have a qualified professional inspect or evaluate existing onsite sewage systems
	Expand use of ACWP nerdy-man posters and PSAs, and Legacy billboards
	Encourage reporting of failing onsite sewage systems to county health department
	Identify, and if necessary, promote funding sources to correct point source problems (WWTP and WWTP lagoons)
	Construct rain garden demonstration projects (Alexander City)
Siltation	Support the Alabama Homebuilders Association in the promotion of the QCIP workshops.
	Lobby county commissions for sufficient funding for dirt road and roadbank maintenance
	Encourage ALDOT and County Engineers to participate in CWP
	Report failing BMPs and other problems to ALDOT and county engineer representatives
	Raise funding for dirt roads workshop
	Investigate incentive for ALDOT and county highway departments for workshop QCP, QCIP, and QCI programs–CEU credit for PEs
	Obtain CEU credit for teachers attending watershed education programs
	Promote conservation easements
	Implement municipal storm water management plans

EXHIBIT 5-13
Middle Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
	Lobby county commissions for sufficient funding for dirt road and roadbank maintenance
	Refer to habitat alteration for forestry management strategies
Habitat alteration	Support adaptive management approach–reach balanced conclusion
	Encourage Forestry Commission registered forester programs
	Work with forestry companies to require stricter BMPs of their subcontractors
	Promote forestry commission education programs
	Work with Treasure Forest Association to educate foresters
	Post signs requesting boaters empty bilge and live well before entering the lake, remove weeds from lower unit of trailers, include pictures of zebra mussels, water hyacinth, and any other invasive species at all public launch ramps; include information (flyer) with entry forms at tournaments
	Work with power company to discourage use of off highway vehicles (OHVs) in lake and streams–place flyer in the bill
	Support power company in its shoreline protection program–continue to educate the public–any other methods of support
	Support power company fish habitat projects
	Support streambank restoration projects–encourage schools to do them
	Encourage use of conservation easements and land trusts (East Alabama Land Trust)
	Encourage reporting of suspicious activities along streams and wetlands to ADCNR, Freshwater Fisheries Division
	Refer to siltation for other management strategies
Pesticides/herbicides	Education–general public and significant users such as ALDOT, power company, and farmers (landowners); facilitate hazardous waste pick up for general public
	Generic incentive program–coupons, promoted by CWP
	Publicize stream and lake ecosystem effects and appropriate usage safeguards
Lake turbidity (clay)	Work with power company to raise winter lake level and extend summer full pool season
	Request that State Marine Police require idle speed (buffer zone) close to shoreline

EXHIBIT 5-13
Middle Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
	Encourage use of protective vegetation along shoreline through LMRA, lake owners association, 4-H, ACES (use door handle advertisement or a flyer in the power bill)
	Support power company in its shoreline protection program–continue to educate the public–any other methods of support
	Support shoreline homebuilder and homeowner awareness initiatives
Lake turbidity (algae)	Monitor and model the effects of point and nonpoint nutrient loading (TWP-AU, UA, LWLM, and ADEM)
	Promote public awareness of causes and economic consequences of cultural eutrophication (e.g., algal blooms)
Illegal dumping and litter	Renew Our Rivers program–use publicity to prevent dumping
	Chamber of Commerce Beautification Committee; organize cleanup as part of its duties
	Countywide mandatory pickup ordinance–solicit county commission for more intensive solid waste program
	Request that power company provide trash bins at its boat ramps
	Promote bottle and can deposits statewide
	Enforce county prima facie litter law
	Use litter bug suit as punishment for littering
	Advertise and support annual lake cleanup programs (LMRA and Renew Our Rivers programs)

EXHIBIT 5-13
Middle Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
Potential carcinogens	Evaluate historical effluent and sediment data and continue monitoring as needed (ADEM, EPA)
	Promote PSAs and incentives for hazardous waste disposal and toxic recyclables (e.g., oil and contaminated fuel)
Specific conductivity (chlorides or other ions)	Evaluate monitoring data and continue monitoring as warranted (Auburn University, USGS, ADEM)

Notes:
BMP = best management practice
CEU = continuing education unit
WWTP = wastewater treatment plant
AWW = Alabama Water Watch
NRCS = Natural Resource Conservation Service
ADEM = Alabama Department of Environmental Management
LMRA = Lake Martin Resource Association
ACES = Alabama Cooperative Extension System
ALDOT = Alabama Department of Transportation
DOT = Department of Transportation
PE = professional engineer
ADCNR = Alabama Department of Conservation and Natural Resources
CWP = Clean Water Partnership
ACWP = Alabama Clean Water Partnership
PSA = public service announcement
EQIP = Environment Quality Incentive Program
SWCC = Soil and Water Conservation Committee
OSS = onsite septic system
TWP = Tallapoosa Watershed Project
TMDL = total maximum daily load
LWLM = Lake Watch of Lake Martin
USGS = U.S. Geological Survey
NPS = nonpoint source
AU = Auburn University
UA = University of Alabama
QCIP = Qualified Credential Inspection Program

Monitoring Plan

On the basis of the known and potential concerns identified by the stakeholders, §303(d)-listed water bodies, and collected water quality and biological data, the following plan for future monitoring is recommended.

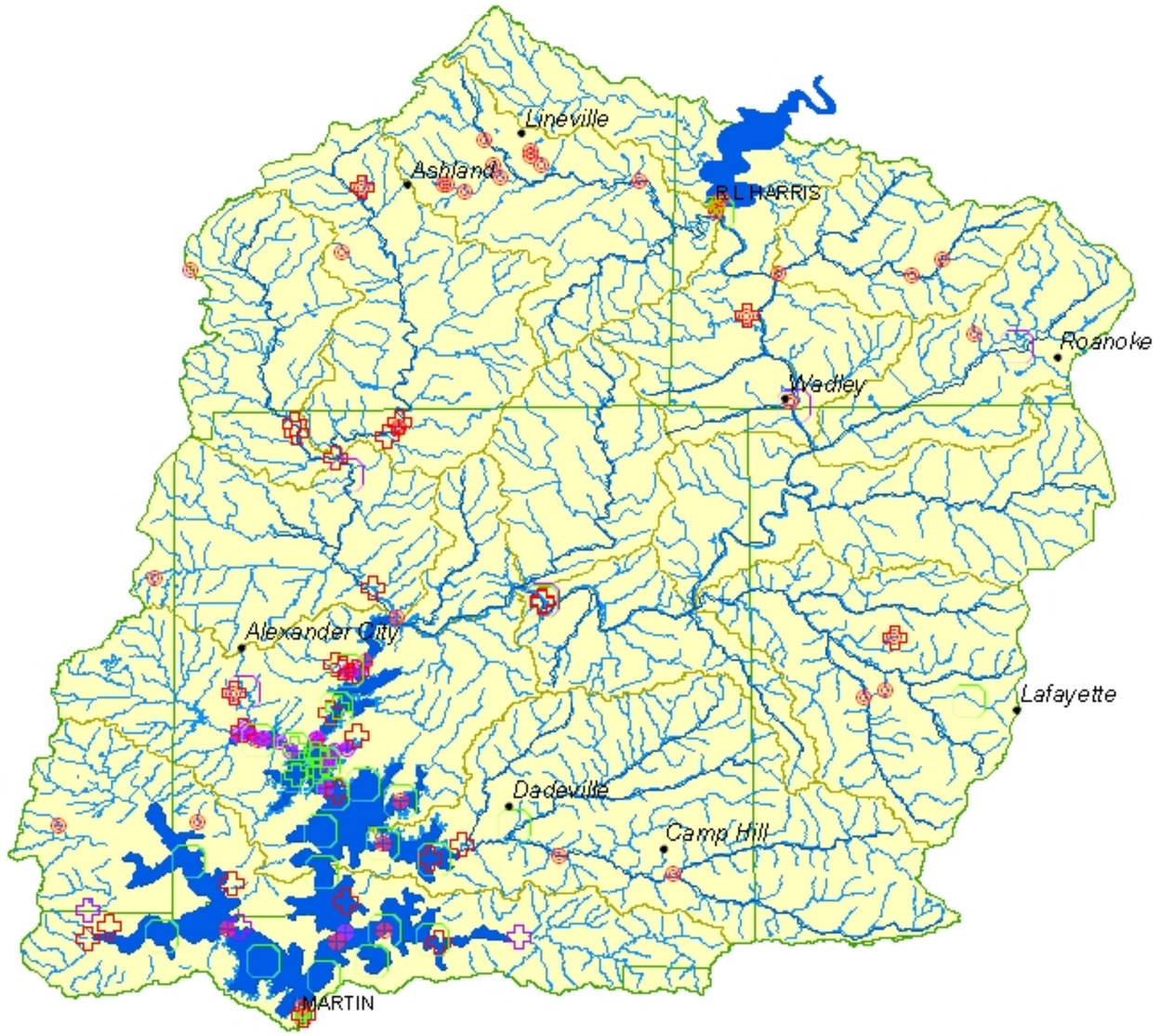
Existing Monitoring

Currently, there are eight organizations monitoring streams and lakes and assessing watershed conditions in the Middle Tallapoosa Watershed (Exhibit 5-6). Exhibit 5-14 depicts the locations of those sampling sites.

EXHIBIT 5-14
Middle Tallapoosa Monitoring Locations
Tallapoosa River Basin Management Plan

Legend

- Cities
- ADEM
- APCo
- AU
- AWW
- Alexander City/AU
- GSA
- Russell Corp.
- TWP
- USGS
- Dams
- Lakes and Ponds
- Major Streams
- Minor Streams
- County Boundaries
- Watershed Boundaries



2 1 0 2 4 Miles

CH2MHILL

Exhibit 5-14
Existing Sampling Locations in the Middle Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Tallapoosa Watershed Project

During 2004 and 2005, as part of the TWP (described in further detail in the Education and Outreach segment), additional stream and lake sites will be sampled to evaluate the concentrations and loadings of nutrients and sediment and their effects on the trophic states in Lake Martin and Lake Wedowee. An additional research team from the University of Alabama, Department of Geography will be monitoring the optically active components of lake surface waters using remote sensing techniques and satellite imagery. The resulting data will be used in geographic information system (GIS) modeling of the nutrient dynamics in the Middle and Upper Tallapoosa Watersheds to support the planning and decision-making needs of the Tallapoosa CWPs and environmental agencies, as well as to support environmental education initiatives.

City of Alexander City

The City of Alexander City has relocated the Sugar Creek Advanced Wastewater Treatment Plant (AWWTP) outfall diffuser to Lake Martin. To evaluate whether the AWWTP is having any effects on lake water quality, Auburn University is monitoring six locations in the lake during the growing seasons of 2003 and 2004.

The Middle Tallapoosa Watershed assessment shows that 9 of the 22 subwatersheds in the Middle Tallapoosa Watershed have no chemical, bacteriological, or biological data (these include the Tallapoosa River, Crooked Creek, Beaverdam Creek, Little Hillabee Creek, Timbergut Creek, Emuckfaw Creek, Sweetwater Creek, Hodnett Mill Creek, and Chikasonoxee Creek subwatersheds). Biological data were limited to only 6 subwatersheds (Fox Creek, Cornhouse Creek, Hurricane Creek, Enitachopco Creek, Hillabee Creek, and Oakachoy Creek).

Monitoring Objectives

The following objectives are suggested to guide future monitoring efforts in the Middle Tallapoosa to meet future watershed assessment needs:

- Continue to monitor the water quality and aquatic integrity of the Middle Tallapoosa to demonstrate improvement of water quality and biological concerns
- Document trends in water quality
- Assess sources and magnitudes of nutrient and sediment loads affecting Lake Martin
- Establish bioassessment (macroinvertebrate) benchmarks for watersheds with varied land uses (forest, agriculture, and urban)
- Make data readily available to the general public and educational curricula
- Optimize use of available resources and avoid duplication through active coordination
- Assess and document the effectiveness of the basin management plan
- Identify areas that need additional attention

Proposed Monitoring Approach

A monitoring plan should be developed to achieve each of the above objectives. It should specify monitoring locations, type of monitoring, and parameters. Sampling design should include the data gathering and analytical resources of ongoing and anticipated watershed studies, such as the TWP.

Because watershed concerns and priorities may change over time as additional information is learned about the health of the watershed, the plan should be reviewed periodically in collaboration with participating organizations to evaluate whether objectives are being met and resources are being used efficiently. To facilitate plan development, the *Draft Middle Tallapoosa Biological and Water Quality Field Sampling Plan* (CH2M HILL) prepared for the CWP's technical subcommittee in October 2001 could be used as a starting point. The following briefly outlines information to consider during plan development.

Water Quality Data

New water quality monitoring locations should address data gaps to improve watershed-based decision-making. As illustrated in Exhibit 5-14, existing stream monitoring locations are concentrated around Lake Martin and Lake Wedowee and tributaries draining urban areas, with industrial and municipal WWTP discharges. Few sampling sites are found in the mostly rural watersheds in the northern portion of the subbasin. Because of the lack of inhabitants in these rural areas, it is unlikely that AWW groups will be established in most of these watersheds. Whenever possible, local colleges and universities, as well as other state and federal organizations (ADEM, GSA, and USGS), should be encouraged to conduct studies focused on priority concerns in partnership with the CWP.

The following stream sample parameters are suggested for future monitoring:

- In-situ measurements–Temperature (air and water), pH, DO, turbidity, and conductivity
- Chemical analyses–TSS, nitrate-nitrite, ammonia, total phosphorus, total hardness, BOD_5, and alkalinity
- Bacteriological tests–preferably E. *coli,* according to recent EPA guidelines

Bioassessment Data

Bioassessments provide information about the long-term health of the aquatic community, which is indicative of the long-term health of the watershed. Organizations such as universities, state, and federal agencies–and to a limited extent, citizen volunteer groups–can perform benthic macroinvertebrate, fish, and habitat assessments. Varying protocols are used in the State of Alabama. Currently, the methodology used by ADEM is preferred for the sake of consistency. However, EPA approval of AWW's bioassessment methods is anticipated within the 2005 to 2006 timeframe. Appendix B provides more information about the AWW program and its bioassessment capabilities.

Implementation Plan

Organizational Structure

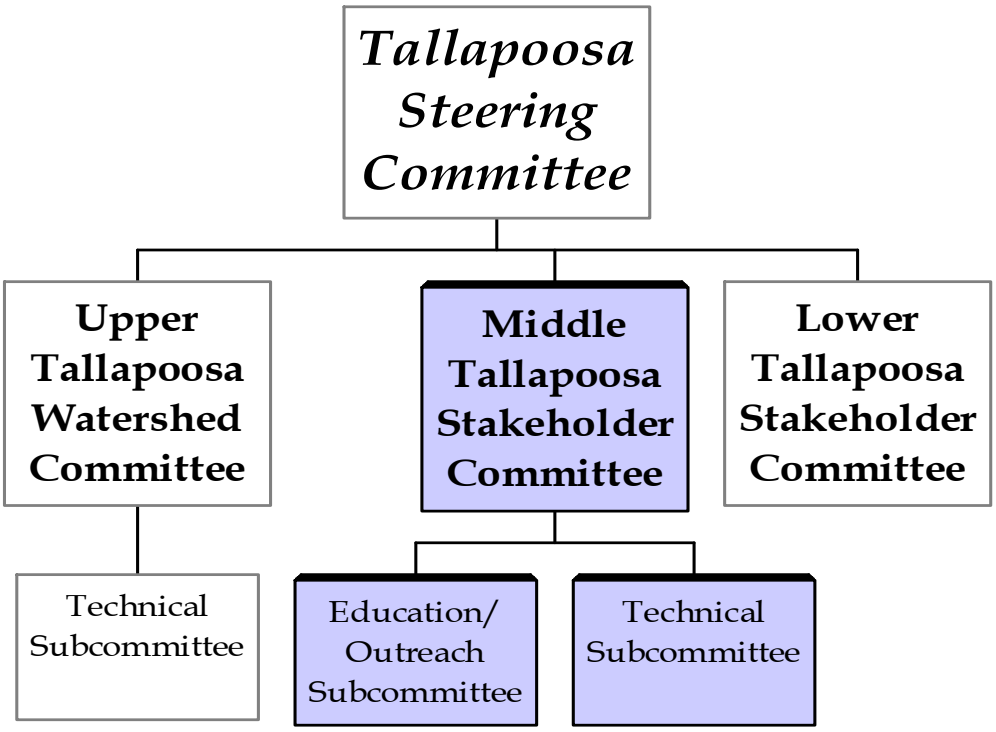
The Tallapoosa River Basin CWP is 1 of 10 basin organizations under the ACWP, which is the statewide umbrella organization. Each of the 10 basins, including the Tallapoosa, has a facilitator who works to coordinate stakeholders in their efforts to protect and restore surface waters within their respective basins. The ACWP and each basin organization are stakeholder-based and driven. Because issues, demographics, and resources vary from basin to basin, facilitators depend on local stakeholders to identify local problems and solutions.

Participation in CWP organizations is voluntary, and most of the management strategies recommended in this plan are designed to be implemented on a voluntary basis. The exceptions are management strategies in urban areas that are related to regulatory policies, such as storm water permits. Each participating partner has the ability to either influence or control the implementation of the strategies described in Exhibit 5-13. For example, municipalities can pass local ordinances, private industries can use innovative technologies that provide better environmental protection, universities can conduct various studies, private citizens can create and implement community-based education and outreach programs, and all stakeholders can help to seek funding and other resources to support strategy implementation.

Although the watershed stakeholder groups are linked through one basinwide organization, each meets and functions independently. Some of the watershed organizations have developed subcommittees to address specific issues and tasks. The Middle Tallapoosa CWP is sponsored by the City of Alexander City. The Middle Tallapoosa Stakeholder Committee meets on a quarterly basis. The Middle Tallapoosa CWP has both Technical and Education/ Outreach subcommittees, these committees usually meet bi-monthly. Exhibit 5-15 depicts the Tallapoosa River Basin CWP.

When implementing the recommended watershed management strategies, participating stakeholders should coordinate efforts among collaborating entities and individuals to prevent the potential duplication of activities and the waste of limited resources. Stakeholders also should work to pool resources to maximize the funding and in-kind services available to support the implementation of the basin management plan. Because some management strategies are similar in the Upper and Lower Tallapoosa River watersheds, collaborative efforts among all basin stakeholders to implement these strategies are encouraged. Additionally, some strategies may be implemented through collaboration and coordination with the ACWP on a statewide basis.

EXHIBIT 5-15
Tallapoosa River Basin CWP Organizational Chart
Tallapoosa River Basin Management Plan

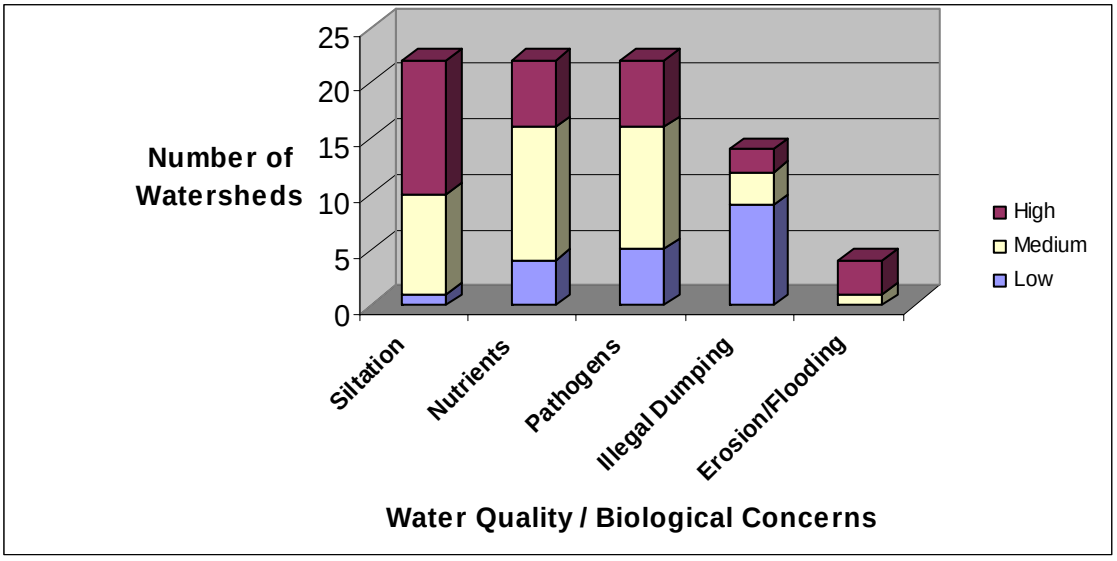


Priorities

During the watershed assessment process, stakeholders prioritized known and potential concerns. Concerns ranked high for the watersheds encompassing Lake Martin focus on the known impairment of Sugar Creek because of nutrients and chlorides; nutrient enrichment in the upper lake embayments from upstream NPSs and from WWTP and sewage lagoon discharges directly into the lake or its tributaries; shoreline and lakebed erosion and related turbidity; urban runoff; and the potential for NPS pollution from pathogen contamination, pesticides, and nutrient enrichment associated with lakefront development. The potential for failing septic systems, excessive use of fertilizer, and waste discharges from boats and houseboats were cited as the primary rationale for high rankings. High specific conductance in the vicinity of the current Sugar Creek WWTP outfall also were listed as a high priority.

Exhibit 5-16 illustrates the frequency of occurrence of assessed priorities for NPS water quality and biological concerns identified by stakeholders for each subwatershed. For example, siltation was identified as a concern in more than 20 subwatersheds and was prioritized as medium more often than it was considered to be a high or medium concern. However, illegal dumping is a concern in fewer than 15 subwatersheds and generally is considered to be a low priority. Siltation, nutrients, and pathogen contamination were assessed as potential concerns in all 22 subwatersheds, with most rated as high or medium.

EXHIBIT 5-16
Watershed Water Quality and Biological Concern Priorities
Tallapoosa River Basin Management Plan



Siltation was assessed as a high priority for 12 subwatersheds, including the Tallapoosa River below Harris Dam and above Lake Martin, Cornhouse Creek, Beaverdam Creek, Hurricane Creek, High Pine Creek, Hodnett Mill Creek, Chatahopsee Creek, Sweetwater Creek, Enitachopco Creek, Elkahatchee Creek, and Sandy Creek subwatersheds. The sources of siltation in the rural area were assumed to be from forestry (silviculture) activities, dirt roads, and road construction. For urban areas, the source of siltation is predominately from development and storm water runoff.

Assessed priorities for nutrient enrichment and pathogen contamination are similar because of common sources in rural and urban areas. Animal waste, pastureland, and failing septic tanks were cited as the potential sources in rural areas. Watersheds with WWTPs and sewage lagoons are associated with water quality concerns that were rated high or medium priority.

Pesticides were ranked as a high priority for two watersheds, associated with mixed agriculture and urban runoff in the High Pine Creek and the Elkahatchee Creek subwatersheds, respectively. The potential for excessive stream bank erosion, flooding, and habitat alteration was rated high for subwatersheds through which the Tallapoosa River flows below R. L. Harris Dam, including the Tallapoosa River, Beaverdam Creek, and Hurricane Creek subwatersheds. These concerns are related to the large flow fluctuations caused by hydro-peaking discharges from the dam, and releases during flood conditions.

Approach

The Middle Tallapoosa is composed of 22 eleven-digit hydrologic units and encompasses all or part of 8 counties. It is not feasible to try to implement all of the management strategies identified in Exhibit 5-13 immediately. Therefore, it is recommended that subwatersheds

with the most high-priority concerns be addressed first. Exhibit 5-17 provides an example of how the stakeholders could proceed.

EXHIBIT 5-17
Implementation Approach
Tallapoosa River Basin Management Plan

Step	Action
Step 1	Rank or prioritize each subwatershed
Step 2	Target top three subwatersheds for implementation projects
Step 3	Establish on-the-ground projects that will address the concerns that have been identified
Step 4	Assign responsibility to stakeholders
Step 5	Determine how to fund projects
Step 6	Obtain funding
Step 7	Begin implementation

Watershed-based Plans

The ADEM Office of Education and Outreach, Nonpoint Source Unit, supports the development of watershed-based plans to identify the specific measures and resources to correct known impairments. These plans focus in greater detail on individual subwatersheds. EPA and ADEM require such plans for § 319(h) funding. The first watershed-based plan to be drafted in the Tallapoosa River Basin is for the Saugahatchee Creek subwatershed in the Lower Tallapoosa subbasin. These more detailed plans are not intended to replace the basin-wide plan; rather, they are intended to supplement it by focusing the efforts of the stakeholders on an individual subwatershed and allowing them to demonstrate improved water quality. ADEM will consider funding the development and implementation of these plans for water bodies that have draft TMDLs. Therefore, a watershed-based management plan for Sugar Creek in the Elkahatchee Creek subwatershed, listed in Exhibit 5-10, would be eligible for §319(h) funding once the draft TMDL is completed.

Education/Outreach

Stakeholder education, outreach, training, and educational programs are important for effective implementation of a watershed management plan. The public is often unaware that the combined efforts of their actions can cause significant NPS pollution problems. Proper education for day-to-day activities such as using appropriate amounts of fertilizer, recycling of motor oil, and collecting and disposing of pet waste can have a huge effect on reducing NPS pollutant loadings to rivers and streams. Stakeholders must be provided with reliable information and resources to increase awareness of water quality problems. Informed watershed users and concerned citizens are more conscious of how their activities affect the water they depend on and are more willing to modify their activities to meet water quality goals.

Education and outreach can be carried out by governmental agencies (local, statewide, or national), educational institutions, not-for-profit organizations, and by citizen volunteers–all stakeholders concerned with protecting, and where necessary restoring, the water quality and integrity of aquatic and riparian habitats within watersheds. Partnerships among various stakeholders and interest groups are key to long-term water quality improvements. Many consider education and outreach to be one of the most effective tools to help improve water quality.

A few of the methods used to provide educational information to the public include television, radio and newspaper announcements or stories, flyers, community newsletters, informational pamphlets, workshops and seminars, and teacher in-service programs. Individuals also receive information through participation in citizen-based watershed stewardship groups and volunteer monitoring programs.

Since 2001, the Middle Tallapoosa Education/Outreach Subcommittee has aggressively pursued implementation of a marketing plan with the mission to educate the citizens about actions they can take to protect, restore, and improve water resources. The plan's goals are as follows:

- Develop a media and public relations campaign to educate and outline actions they can take to assist in protecting the waterways
- Develop and implement programs for schools to educate students in ways of protecting, restoring, and improving the Middle Tallapoosa River subbasin
- Plan and implement programs with community organizations, government, and industry to educate and encourage their participation in efforts to protect, restore, and improve the state's water resources

An emphasis has been placed on matching the needs of the CWP with opportunities that will optimize the mutual benefits of the technical and education outreach committees' initiatives.

Ongoing Activities

Several education and outreach initiatives are underway in the Middle Tallapoosa to support the goals listed above, as well as serving the technical needs (sampling, modeling, and BMP needs) of the CWP. Ongoing activities include the following:

- **ACWP–**This organization has developed a variety of educational materials to be used in each of the ACWP river basins. In the Middle Tallapoosa Watershed, brochures and other printed handouts, public service announcements, and videos have been used. Through the ACWP, brochures for each river basin that include local information have been developed and distributed. The ACWP, in cooperation with ADEM, created a series of television public service announcements about NPS pollution. These were aired on local television stations in the watershed. Additionally, the ACWP created two videos–one is about the ACWP organization and the other is about TMDLs.
- **AWW–**Initially dedicated to training primarily adult groups in how to monitor and evaluate the physical, chemical, and biological features of water, AWW has expanded its focus to environmental education of youth. AWW staff at Auburn University's

Department of Fisheries, AWW Association's certified water quality trainers, and local AWW citizen volunteer monitoring groups provide a variety of resources to help inform Alabama citizens about water quality and the importance of protecting their streams and lakes. More than 4,000 people have received training in stream ecology and monitoring techniques in AWW workshops. Environmental education is an intervention strategy that AWW has used successfully since 1993, beginning with LWLM, the first of currently 80 AWW citizen volunteer monitoring groups across Alabama. This group remains active with monitoring and education outreach efforts around their respective lakes. The following are AWW programs:

- *Workshops*–AWW provides workshops on monitoring for water quality, bacteriology, and assessments of macroinvertebrate communities (bioassessment) for citizen groups and in-service teacher training. Citizen monitoring manuals have been developed for each of the above types of monitoring. AWW also publishes informative booklets such as the Citizen Guides to Alabama Rivers, Alabama, Coosa, and Tallapoosa (summer 2002), as well as the "Citizen Volunteer Water Quality Monitoring of Alabama's Reservoirs" publications for Lakes Martin (February 2000) and Wedowee (June 2003) that help identify the water quality issues affecting the economy and quality of life in the Tallapoosa River Basin. Additionally, AWW maintains an online database of volunteer monitoring data with easy-to-use tools for comparing data and graphically displaying trends (www.alabamawaterwatch.org). This capability provides a wealth of readily accessible information about the health of watersheds for users of all ages and informational needs.

- *Education Program*–An example of a successful AWW volunteer group environmental education program that has become an integral part of the Middle Tallapoosa CWP educational outreach program is LWLM's "Living Streams" program (described below). Other recent AWW education outreach initiatives involving other Middle Tallapoosa CWP members include the TWP and a stream bioassessment initiative to develop citizen monitoring protocols and educational materials related to macroinvertebrate monitoring (both described later).

- ***Development of Citizen Volunteer Protocols and Educational Materials Related to Stream Macroinvertebrate Monitoring–***This 2-year project, summer 2004 through 2006, is funded by the Auburn University Environmental Institute, Alexander City, and the Middle Tallapoosa CWP. It combines the resources of the AWW program office and Auburn University's Department of Curriculum and Teaching. Its goals are to establish the scientific credibility of AWW's stream bioassessment (macroinvertebrate) protocols, to increase AWW involvement with environmental education of youth, and to promote the long-term sustainability of the AWW bioassessment program by integrating it into Auburn University's curriculum for teacher intern. The project will use AWW citizen groups (LWLM and Save Our Saugahatchee in the Lower Tallapoosa) to assist with bioassessments at selected stream sites in the Tallapoosa Basin. Additionally, two workshops for science teacher interns will be conducted and local school groups will be able to participate in environmental education field trips associated with the planned macroinvertebrate sampling activities in the watershed.

- ***LWLM "Living Streams" Program–"***Living Streams" is a bioassessment field program to broaden the environmental education of youth. Developed by LWLM in collaboration with the AWW program office at Auburn University, the program demonstrates the important linkage between the numbers and types of aquatic macroinvertebrates (insects, mollusks, and crustaceans commonly found in streams and lakes that can be seen without the aid of a microscope) and water quality within local watersheds. It challenges children to think about various causes and effects of water pollution and habitat degradation within their local watersheds and ways to protect water quality. Focused primarily on middle-school age youth, the program also serves scout groups, boys and girls clubs, and church groups, as well as groups of children with special needs. "Living Streams" is now a mainstay for environmental education programs throughout Tallapoosa County through a partnership between LWLM and the Tallapoosa County Extension Office. Each year, all fifth-graders in the county benefit from the program as part of their springtime "Classroom in a Forest" field trip. As of summer 2004, approximately 3,000 children have benefited from this program.
- ***Classroom in the Forest***–This is a field class program primarily for middle school children (grades 4 to 6) conducted by the ACES Tallapoosa County Office with support from volunteer groups such as LWLM, Treasure Forest Landowners, and Master Gardeners; agencies such as Alabama Forestry Commission, Alabama Game and Fish, the NRCS, and Farm Services Agency; and funded by a grant through the Alabama Treasure Forest Association–Tallapoosa County Chapter from the Bradley/Murphy Education Trust Fund. In conjunction with the TWP, the program has broadened the conceptual framework from "forest" to "watershed" and provides a clear connection between various research findings and education in the field and classroom. A portion of the International *Global Learning and Observation to Better the Environment Program* (*GLOBE Program*) is used as an educational vehicle to incorporate project results from remote sensing techniques. Students will learn how to interpret remote sensing data and to assess land cover. They also learn about the relationship between land cover patterns, water quality, and trophic conditions in aquatic habitats. This educational program is approved by the Alabama Department of Education and will be expanded to other counties within the Tallapoosa River Basin.

- **The Tallapoosa Watershed Project*:*** A Transferable Model of Stakeholder Partnerships for Addressing Nutrient Dynamics in Southeastern Watershed–This 3-year project (September 2003 through 2006) integrates a variety of research, education, and extension activities to provide relevant, locally generated watershed information supporting the development and implementation of the Tallapoosa River Basin Management Plan. A $550,000 USDA Cooperative State Research, Extension, and Education System grant funds this effort. The project team draws expertise from Auburn University's Fisheries Department, the University of Alabama's Geography Department, Alabama's Department of Education, and LWLM. Research focuses on a comprehensive assessment of nutrient concentrations and loadings in the Tallapoosa River system. The costs-benefits of various levels of technology for watershed assessment will be compared to include AWW community-based monitoring, standard methods analysis, close-range hyperspectral sensing, satellite remote sensing, and GIS modeling. Research data and

analyses are being adapted for education in the form of in-classroom curricula, teacher workshops, annual state-of-the-watershed conferences, and a public display at the environmental center of Alabama's Special Camp for Children and Adults (ASCCA) at Lake Martin. During spring 2004, 15 teachers from Tallapoosa County schools benefited from a 2-day workshop on stream ecology and bioassessment. Similar workshops are planned for 2005 and 2006. Water quality data, analyses, and GIS modeling results will be made available to stakeholder groups through the AWW, ACES, and Tallapoosa CWP website Dataviewers:

- *GIS Modeling*–GIS-based watershed modeling can help identify and understand the cause and effect relationships between water quality, the physical environment, and aquatic biota in the Middle Tallapoosa. Models such as those associated with the Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) provide analytical capabilities that:
  - Facilitate examination of environmental information
  - Support multipurpose analysis of environmental systems
  - Provide a framework for assessing management alternatives

  As documented in the fore mentioned watershed assessment, sediment (primarily siltation and clay turbidity) and nutrients are assessed as high-priority concerns. To help address these concerns, the Middle Tallapoosa CWP and members of the TWP are collaborating on a GIS modeling effort to evaluate the sources and magnitudes of sediment and nutrient stream loads from the Middle and Upper Tallapoosa watersheds. The linkage between land cover and related land use practices and resulting stream sediment and nutrients loadings is a key focus. This modeling will facilitate assessments of land use and BMP alternatives within subwatersheds, as well as assist in "environmentally sensitive" decision-making. Additionally, the project's GIS modeling will analyze the spatial and temporal dimensions of nonpoint nutrient loading in Lake Martin and Lake Wedowee (R. L. Harris Reservoir), especially with regard to the trend toward higher trophic states in the upper embayments of these lakes. The results of this modeling also will support an ADEM initiative to establish lake water quality criteria for the northern portion of Lake Martin, as well as to assist in the development of watershed TMDLs.

- **Rain Garden BMP Initiatives**–The City of Alexander City, Middle Tallapoosa CWP, Auburn University, ACES, and other partners are working with communities throughout the Middle Tallapoosa to identify ways to protect streams, rivers, and lakes. Rain gardens have been installed to demonstrate a relatively inexpensive BMP that addresses urban runoff issues in the Sugar Creek subwatershed of Alexander City. Three rain gardens were constructed to promote an innovative practice that communities can put on the ground that will improve storm water quality before the storm water hits local streams. When it rains, pollutants such as oil, pet waste, clay, and excess pesticides may wash into streams, rivers, and lakes. These pollutants can harm aquatic life and make waters less desirable for activities such as swimming, fishing, and boating. Rain gardens are shaped like bowls and catch storm water for mini-processing. The rain gardens were constructed at the Charles Bailey SportPlex, Radney Middle School, and Benjamin Russell High School in Alexander City with the help of children

from the Alexander City Boys and Girls Club, Master Gardeners, Auburn University Students, and LWLM. Each of the rain gardens will have signs explaining how it benefits the water quality of the community. Additional rain gardens may be constructed, along with other BMP projects, as a result of the Alexander City Design Project.

- **Community Vision Project–**During the fall of 2004, the Middle Tallapoosa CWP, Alexander City, and the Auburn University Department of Landscape Architecture partnered on a "community vision" project to plan for future growth, improve existing conditions, and focus efforts on keeping the community's water healthy. Auburn University Landscape Architecture students, as part of a class project, put together plans that have rain gardens as well as other practices such as permeable parking, storm water wetlands, and even green roofs. This project not only benefits Alexander City, but also demonstrates to other communities the resources that can be harnessed to address local needs. In the case of Alexander City, the design initiative helped community leaders focus on ways and means to reduce storm water runoff, which leads to flooding and increase nutrients from over-fertilization.

- **Environmental Education Brochures–**These are a series of public information pamphlets to promote awareness of NPS pollution. The following brochures were prepared by the East Alabama Regional Planning and Development Commission:

  – What We All Need to Learn About Water
  – How Litter and Illegal Dumping Affect Your Water Quality
  – How Sediments Affect Your Water Quality
  – How Pathogens Affect Your Water Quality
  – How Nutrients Affect Your Water Quality

  The pamphlets are available for distribution to communities throughout the Middle Tallapoosa and can easily be replicated in other watersheds.

- **Camp ASCCA Environmental Center–**Camp ASCCA provides an excellent setting for watershed-based environmental education programs. New to the Camp is the Oscar C. Dunn Environmental Center, situated on the shore of Lake Martin. This center will have a series of interactive displays depicting the connection between land, air, and water and their integral ecological settings. The concept of a watershed is emphasized to demonstrate the relationships between water use, land use, and other human impacts on the quality and integrity of aquatic and riparian resources. Camp ASCCA also will be the site of the State of the Watershed Conference to be held annually beginning in spring 2005.

- **Nonpoint Source Education for Municipal Officials (NEMO)–**This program was developed to educate local community leaders about how decisions related to land use planning and development affect water quality. Trained members of a speaker's bureau, including the Tallapoosa River Basin facilitator, are available to make presentations to community groups.

- **Alabama Envirothon**–High school students have the opportunity to compete in an international program designed to increase their knowledge about the environment.

Students are challenged to use their critical thinking skills to demonstrate their understanding about aquatic resources, soils, forestry, wildlife, and current environmental issues. Camp ASCCA on Lake Martin hosted the 2004 event. Members of LWLM assisted with the water quality portion of the program.

- **Newspaper and magazine articles–**In pursuit of the Middle Tallapoosa CWP's goals, the education outreach committee has promoted community awareness through publishing articles in local newspapers, organizational newsletters, and magazines. These articles covered various water projects, environmental group activities, water events, and water facts. This activity was to aid in raising community awareness of the environment and inspiring interest in conservation practices.

- **Lake Martin Cleanup–**During the past 15 years, the Lake Martin Resource Association (LMRA) has coordinated a cleanup for Lake Martin. Generally, 100 to 200 volunteers arrive each year to remove litter from the lakeshore and the islands. Waste Management and Browning-Ferris Industries (BFI) donate trashcans, APCo supplies trash bags, and LMRA provides T-shirts. The Middle Tallapoosa CWP may work with LMRA and APCo to continue this lake-wide cleanup as part of the Renew Our Rivers program.

- **Anti-Litter Campaign–**During the past 3 years, the City of Alexander City has conducted a litter bug campaign. Those persons discovered dumpling litter in the City limits were compelled to wear a "litter bug" suit while picking up trash around the City. In addition, two billboards with anti-litter messages are posted on State Highway 22 West and U.S. Highway 280. Recently the City designated a police officer in the Drug Abuse Resistance Education (D.A.R.E.) program to monitor illegal dumping and litter sites. Since then, almost all of the litter and illegal dumping has been eliminated in the City limits.

- **Storm Water Monitoring Program–**In addition to the anti-litter campaign, the City is planning to develop a storm water monitoring program; it has 21 employees trained in the QCIP workshop; and has an aggressive infiltration and inflow (I/I) program for the Coley, Christian, and Dobbs Creek basins.

- **Other Activities**–Education/outreach activities have included distributing T-shirts and decals with the Middle Tallapoosa CWP logo, and advertising CWP initiatives and informational materials at the Octoberfest held annually in Alexander City. Additionally, several members of the committee have responded to requests for presentations on CWP initiatives at local civic group meetings and government meetings.

- **Qualified Credential Inspector (QCI) Training**–The Qualified Credentialed Inspection Program (QCIP) provides training about the requirements of the Alabama NPDES rules; ADEM's construction storm water management program; evaluation of construction sites to ensure that QCP-designed and certified BMPs detailed in a Construction Best Management Practices Plan (CBMPP) are effectively implemented and maintained; and evaluation of conveyance structures, receiving waters, and adjacent affected offsite areas to ensure the protection of water quality and compliance with the requirements of the Rule. Through a partnership with CH2M HILL and the Home Builders Association of Alabama, thousands of builders, developers, public and private utilities, ALDOT,

county officials, and municipal employees have participated in the credentialed workshops, where they learn about ADEM construction storm water rules and erosion and sediment control BMPs. In the Lower Tallapoosa Watershed, City of Auburn employees have undergone this training.

Stakeholder-suggested Activities

In the Middle Tallapoosa Watershed, many effective educational programs are in place that focus on water quality issues. But much more could be done to raise awareness and to educate local citizens about the importance of protecting surface water.

Additional education and outreach strategies identified by stakeholders are as follows:

- **Water festivals**–Water festivals have been successful in the Lower Tallapoosa subbasin. These provide opportunities for educational field trips during which students participate in three "hands-on" activities related to water quality and the protection of our natural resources. In 2003, the Upper Tallapoosa Watershed Committee sponsored a Water Fair in Randolph County. The fair was a family event open to the entire community. Various agencies and organizations had booths set up offering environmental educational materials. At the end of the day, a drawing for a canoe was held. Each person was given a pamphlet with several environmental trivia questions to answer. These pamphlets were used in the drawing. Either type of event would be beneficial to the Middle Tallapoosa Watershed.
- **Promote education about septic system maintenance**–Failing onsite septic systems cause human waste to leach into the soils surrounding the system. This waste, which has high levels of fecal bacteria, can make its way into nearby water bodies and pollute them. Homeowners can be made aware of proper maintenance activities through workshops, reminder notices for pumping, and flyers on proper operation and maintenance. Installers and dischargers also can be educated about the hazards and encouraged to attend onsite wastewater training.
- **Encourage and promote recycling and reuse in the following ways:**
  - Recycling Program**–**The City also recycles approximately 10 tons per month of cardboard, newspaper, number one and two plastic, tin cans, and aluminum cans. This program began in 1992 as curbside pick up. Currently, there is a drop off point where about 500 citizens routinely drop off recyclable materials.
  - Biosolids are nutrient-rich organic materials that are a by-product of the treatment of wastewater. When treated and processed, this material can be recycled and applied like a fertilizer to improve and maintain productive soils and to stimulate plant growth. Recycling biosolids saves local and state government significant amounts of money through lower management costs and the reduction of biosolids in landfills.
  - Treated municipal wastewater that is reclaimed (or recycled) is most commonly used in large-scale commercial applications such as golf courses, athletic fields, and landscapes. However, it also is being used for irrigation in residential areas. Water conservation is just one benefit to using reclaimed water. In addition, the quality and cost of this water is improving, making it ideal for irrigation applications.

- **Inform point source facilities about funding to correct issues (WWTP, wastewater treatment [WWT] lagoons, etc.)–**Point source pollution generally comes from the large amount of wastewater discharged from the pipes of industrial facilities and municipal sewage treatment plants into rivers, streams, lakes, and the ocean. The Water Quality Information Center (http://www.nal.usda.gov/wqic/) at the National Agricultural Library Agricultural Research Service, USDA, provides links to many federal financial tools that can be used to correct water quality hazards and issues. Awareness of these sources can aid in better water quality.

Additional Education and Outreach Opportunities

Other potential educational strategies that may be considered are as follows:

- **Watershed boundary signs**–These signs may be located along roadways to inform motorists and pedestrians that they are entering the Middle Tallapoosa Watershed.
- **Expand existing relationships with local colleges and universities and other educational institutions to encourage research studies in this watershed**–Students in ecological and environmental programs often perform fieldwork or conduct small monitoring projects as part of their studies. These universities (or colleges) can serve as a resource for citizens to become aware of work being performed in their community. Workshops focusing on the specific aspects of watershed health and function also can be carried out by universities to homeowners and school teachers to aid in water quality awareness.
- **Promote the use of storm water drain stenciling**–Storm water runoff, or wet weather flow, is often collected by storm drains. This runoff carries pollutants that are harmful to our streams. Many of these chemicals are from household items such as automobile maintenance products, household cleaning products, and yard maintenance products. Stenciling the message "Dispose No Waste, Drains to Creek," helps to create public awareness and enhance the quality of a local watershed. The storm drain stenciling program can be used as an educational component for classrooms and community groups.
- **Develop, promote, and implement stream cleanup days–**Many civic groups promote local cleanup efforts. Annual lake cleanups occur on Lake Wedowee with APCo's help as part of the Renew Our Rivers program. This program also may be implemented in the Lower Tallapoosa in the fall of 2005. In the Middle Tallapoosa, LMRA has sponsored a cleanup on Lake Martin annually, as mentioned above. However, cleanups need to be planned in areas where there typically has been no involvement. These cleanups need to occur routinely throughout the watershed to protect water quality from pollutants and to improve the aesthetics and the value of the streams. Involvement and coordination can be solicited from schools, universities, and local businesses with advertisements placed on local radio stations and television stations.
- **Create organized planting projects for habitat restoration and enhancement–**Native plants can be planted along a stream or wetland by volunteers from the community. Involvement can be solicited from the Girl Scouts and Boy Scouts, the Boys and Girls Clubs, and other youth organizations. As with the rain garden initiative in the City of Alexander City, activities such as this will promote the importance of reducing runoff

and the resulting streambank erosion and will demonstrate how everyone can make a difference.

- **Publicity Campaign–**Radio and television public service announcements, posters, and bumper stickers promoting stewardship of natural resources have been produced and can be used to increase public interest and be distributed to schools and the general public.

On-the-Ground Strategies

Increasing public awareness and implementing BMPs are both required to improve the water quality and biological integrity of a watershed. As discussed in Section 3, most counties in Alabama do not have home-rule authority. None of the counties in the Tallapoosa River Basin have this regulatory authority. Therefore, the only zoning that they can establish is through subdivision regulations. For this reason, the types of on-the-ground strategies that can be employed in the jurisdiction of city governments will be different from those in other areas. The implementation methods discussed below for rural areas will be more restricted than those in urban areas.

Urban BMPs

The Middle Tallapoosa CWP Stakeholder Committee has identified management strategies that can be implemented in urban watersheds (Exhibit 5-13). Some examples include "environmentally sensitive" initiatives, biosolids land application, and impact fees for abandoned buildings. In addition to recommendations from stakeholders, municipalities are required to meet certain standards (CWA, Safe Drinking Water Act [SDWA], and Storm Water Phase II). These regulations often involve the inspection and cleaning of sanitary sewers, maintenance of detention ponds, and proper solids handling.

The parameters of concern most frequently identified by the Middle Tallapoosa CWP are siltation, nutrient enrichment, and pathogen contamination. Habitat alteration, illegal dumping, lake nutrient enrichment and lake turbidity also were mentioned repeatedly. Riverbank erosion and flooding are the main concerns for the segment of the Tallapoosa River below R. L. Harris Dam that is affected by hydro-peaking discharges. Exhibit 5-18 is a matrix chart of recommended management strategies for urban areas in the Middle Tallapoosa Watershed. The strategies are a mix of feedback from the Middle Tallapoosa CWP stakeholders and other items that may not have been discussed. Some strategies address multiple water quality and biological concerns.

EXHIBIT 5-18
Urban BMPs
Tallapoosa River Basin Management Plan

Parameter of Concern	Riparian Buffers	Pervious Parking	Surface Sand Filter	Biosolids Reuse	Constructed Wetlands and Rain Gardens	Storm Drain Stenciling	Illicit Discharge Detection and Elimination
OE/DO	X		X				X
Siltation	X		X		X		
Nutrient enrichment	X		X	X			X

EXHIBIT 5-18
Urban BMPs
Tallapoosa River Basin Management Plan

Parameter of Concern	Riparian Buffers	Pervious Parking	Surface Sand Filter	Biosolids Reuse	Constructed Wetlands and Rain Gardens	Storm Drain Stenciling	Illicit Discharge Detection and Elimination
Pathogen contamination	X	X	X		X		X
Habitat alteration	X				X		
Illegal dumping						X	
pH					X		X

Note:
OE/DO = organic enrichment/dissolved oxygen

Rural BMPs

Because of the lack of home rule authority in the counties in the Tallapoosa River Basin, it is best to work with existing regulatory programs and other voluntary means to effect watershed improvements. In the Middle Tallapoosa, primary concerns in rural areas are related to mainly forestry (silviculture) and agriculture dominated by pastureland use. Listed below are management strategies, some of which were suggested by Middle Tallapoosa Watershed stakeholders.

Agriculture

The most common water quality concerns generated by certain agricultural practices are caused by the presence of sediment, nutrient enrichment, pesticides, bacteria, and a variety of other chemicals used in the farming industry. Proper agricultural practices can be used to avoid creating water quality and biological concerns. The NRCS, SWCDs, and ACES have a variety of cost share (refer to Section 7) and educational programs for landowners to access. Exhibit 5-19 lists some agricultural BMPs.

Surface Mining

Sand and gravel operations occur in some of the Middle Tallapoosa Watersheds. The effective use of BMPs can prevent the degradation of water quality and habitat. Exhibit 5-20 lists some surface mining BMPs.

EXHIBIT 5-19
Agricultural BMPs
Tallapoosa River Basin Management Plan

Parameters of Concern	Conservation Tillage	Conservation Buffers	Livestock Fencing	Other Erosion and Sediment Control Practices
OE/DO	X	X	X	X
Siltation	X	X	X	X
Nutrient enrichment	X	X	X	X
Pathogen contamination		X	X	
Habitat alteration			X	X

Notes:
AFO = animal feeding operation
OE/DO = organic enrichment/dissolved oxygen

EXHIBIT 5-20
Surface Mining BMPs
Tallapoosa River Basin Management Plan

Parameter of Concern	Temporary and Permanent Seeding	Slope Management	Grass-lined Channels	Sediment Pond
OE/DO	X	X	X	X
Siltation	X	X	X	X
Nutrient enrichment	X	X	X	X
Habitat alteration	X	X	X	X

Note:
OE/DO = organic enrichment/dissolved oxygen

Forestry

Properly managed forestlands provide water, fish and wildlife habitat, aesthetic value, and recreational opportunities. Exhibit 5-21 lists some established forestry BMPs and the water quality and biological parameters that they address.

EXHIBIT 5-21
Forestry BMPs
Tallapoosa River Basin Management Plan

Parameters of Concern	Preharvest Planning	Streamside Mgmt. Zones	Forest Wetlands Protection	Road Construction and Maintenance	Revegetation	Fire Mgmt.	Forest Chemical Mgmt.
OE/DO		X					
Siltation	X	X	X	X	X	X	
Nutrient enrichment	X	X	X		X	X	
Pathogen contamination		X					
Habitat alteration	X	X	X	X	X		
pH							X

Note:
OE/DO = organic enrichment/dissolved oxygen

6. Lower Tallapoosa

6. Lower Tallapoosa

Background Information

The watershed area consists of 1,086,129 acres, which includes a 6-county area and 18 watersheds that drain to the Lower Tallapoosa River (Exhibit 6-1). At the western end of this watershed, the Tallapoosa River merges with the Coosa River to form the Alabama River. These three rivers comprise the ACT Rivers Basin, which flows south through Alabama and converges with the Tombigbee River to form the Mobile River, where it enters the Gulf of Mexico in Mobile, Alabama.

The headwaters flow through the northern portion of the study area, where pasture/hay production, row crops, and mixed forest are the predominant land uses. There is little urban development in the watershed with the exception of the Jenkins, Calebee, Sougahatchee, and Chewacla Creek subwatersheds, where the primary land uses are residential and commercial/industrial. Additionally, there are numerous surface mining operations near the outlet of several subwatersheds.

Yates Reservoir

The Yates Reservoir (Exhibit 6-2) was created in 1928 and Thurlow Dam was constructed in 1930, both for the purpose of additional flood protection. The Yates project is the third in a series of four APCo projects on the Tallapoosa River.

Yates Lake has a surface area of 1,920 acres and a storage capacity of 26,000 acre-feet. The Yates Dam has an open-crest spillway with an elevation of 344 feet. Flows in excess of turbine capacity flow over the spillway. The generating capacity of the project is 37 megawatts (MW). The penstock capacity is 9,755 cfs.

Thurlow Reservoir

The Thurlow Dam (Exhibit 6-3) is the fourth APCo dam on the Tallapoosa River. APCo operates the Thurlow project, together with the Yates project, to meet downstream flow requirements on weekends, when the upper two storage projects (Harris and Martin) typically are not operating. The Thurlow project's primary purpose is hydropower, but the reservoir also provides storage for water quality, water supply, and recreation. APCo also operates the project to provide a continuous minimum release of 1,200 cfs.

The Thurlow Reservoir (commonly referred to as Lake Talisi) has no flood control storage. APCo coordinates the Thurlow operation with the other Tallapoosa River projects to minimize flooding.

Insert Exhibit 6-1, Lower Tallapoosa Watershed

Legend

10: Wind Creek
20: Channahahatchee Creek
30: Sougahatchee Creek
40: Stone Creek
50:Chewacla Creek
60: Opintlocco Creek
70: Uphapee Creek
80: Tallapoosa River
90: Tumkeehatchee Creek
100: Calebee Creek
110: Goodwater Creek
120: Cubahatchee Creek
130: Old Town Creek
140: Line Creek
150: Miller Creek
160: Chubbehatchee Creek
170: Jenkins Creek
180: Harwells Mill Creek

3 1.5 0 3 6 Miles

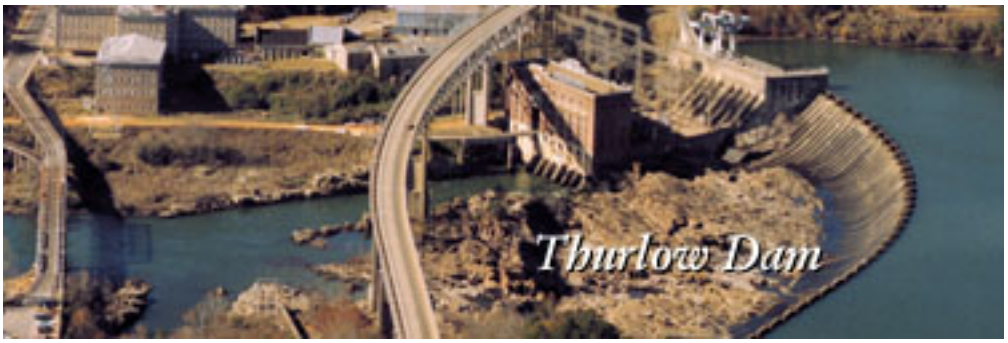
CH2MHILL

Exhibit 6-1
Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

EXHIBIT 6-2
Yates Reservoir Dam
Tallapoosa River Basin Management Plan

(Photo Source: Alabama Power Company)

EXHIBIT 6-3
Thurlow Reservoir Dam
Tallapoosa River Basin Management Plan



(Photo Source: Alabama Power Company)

Thurlow Reservoir is by far the smallest of the four Tallapoosa River reservoirs. The surface area of the lake is 585 acres, and the storage capacity is 11,000 acre-feet. APCo typically operates the project at 289 feet with little fluctuation. The generating capacity at the project is 58 MW.

Water Quality and Biological Data and Analyses

For the purposes of this plan, recent water quality data (5 years old or less) and associated reports on watershed-related data for the Lower Tallapoosa were obtained from government agencies and other organizations, as shown in Exhibit 6-4, which lists the sources of data for the Lower Tallapoosa Watershed. This information was input into the Lower Tallapoosa CWP Dataviewer to be viewed online through the ACWP website. Summary tables of the following parameters can be viewed at www.cleanwaterpartnership.org/lowertallapoosa/: DO, temperature, pH, fecal coliform, chlorophyll *a*, benthic studies, habitat assessments, and fish IBI scores.

EXHIBIT 6-4
Water Quality and Biological Data in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Agency	Period of Record	Project/Report Name	Data Type
ADEM	2002 - 2003	Alabama's 2004 Integrated Water Quality & Assessment Report (§305(b) Report)	Chemical, physical, habitat, biological
ADEM	2000	§303(d) Water Body Monitoring Project	Chemical, habitat, biological
ADEM	2000 – 2002	Alabama 2002 Water Quality Report to Congress (Clean Water Act § 305(b) Report)	Chemical, physical, habitat, biological
ADEM	1997 – 2000	Alabama Monitoring and Assessment Program (ALAMAP)	Chemical, physical, habitat
ADEM	1997	Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs–1997	Chemical, physical, biological
ADEM	1990 – 2000	Reservoir Water Quality Monitoring Program (RWQMP)	Chemical, bacteriological
ADEM	2000	Screening Assessment of the Tallapoosa River Basin–2000	Chemical, habitat, biological
ADEM	1998	Monitoring of Watersheds Associated with Alabama State Parks Using Chemical, Physical, and Biological Assessments	Chemical, physical, habitat, biological
ADPH	2003	Fish Consumption Advisories	Fish
Auburn University	2001 – 2002	Nutrient and Sediment Loading in Saugahatchee Creek and the impacts on Aquatic Biota	Chemical, physical, habitat, biological
Auburn University	1998 – 2000	Several Projects	Chemical, habitat, biological
AWW	2000 – 2003	Auburn Outing Club	Chemical
AWW	1998 – 2003	Chewacla Water Watch	Chemical, bacteriological
AWW	1997 – 2003	Environmental Awareness Organization	Chemical
AWW	1998 – 2003	Friends of Chewacla-Uphapee Watershed	Chemical, bacteriological
AWW	1999 – 2003	Friends of Hodnett Creek	Chemical, bacteriological
AWW	2002	Jack & Donny Water Watch (Inactive)	Chemical
AWW	1997 – 1998	League of Women Voters (Inactive)	Chemical
AWW	1997 – 2003	Save Our Saugahatchee	Chemical, bacteriological
AWW	1997 – 2003	Tri-River Region Water Watch	Chemical, bacteriological
AWWB	1998 – 2002	Surface Water Quality Monitoring	Chemical, bacteriological
GSA	2000	Groundwater Data	Chemical, physical, bacteriological
MWWSSB	2000 - 2003	Surface Water Quality Monitoring	Chemical, bacteriological
SWCD	1998	County Watershed Assessments	Watershed
Tuskegee University	2001 – 2002	Assessment of Nitrogen and Phosphorus Loadings in Three Creeks in the Lower Tallapoosa Using BASINS	Chemical

EXHIBIT 6-4
Water Quality and Biological Data in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Agency	Period of Record	Project/Report Name	Data Type
USGS	1999 - 2003	02418230–Sougahatchee Creek at Co. Rd. 188 near Loachapoka, Alabama	Chemical, flow
USGS	1997 - 2002	02418500–Tallapoosa River below Tallassee, Alabama	Chemical, flow
USGS	2002 - 2004	02418760–Chewacla Creek at Chewacla State Park Near Auburn, Alabama	Flow
USGS	1997 - 2003	02419000–Uphapee Creek near Tuskegee, Alabama	Chemical, flow
USGS	1997 - 2003	02419500–Tallapoosa River at Milstead, Alabama	Flow
USGS	1997 - 2003	02419890–Tallapoosa River near Montgomery–Montgomery Water Works, Alabama	Chemical, flow

Notes:
ADEM = Alabama Department of Environmental Management
ADPH = Alabama Department of Public Health
AWW = Alabama Water Watch
AWWB = Auburn Water Works Board
GSA = Geological Survey of Alabama
USGS = U.S. Geological Survey
MWWSSB = Water Works and Sanitary Sewer Board of the City of Montgomery
SWCD = Soil and Water Conservation District
BASINS = Better Assessment Science Integrating Point and Nonpoint Sources

Sougahatchee Creek Study

In collaboration with the City of Auburn, the City of Opelika, and WestPoint Stevens, Auburn University performed a comprehensive assessment of the Sougahatchee watershed. The *Nutrient and Sediment Loading in Saugahatchee Creek and Impacts on Aquatic Biota Study* (Bayne, et. al., 2004) illustrates that the nutrient loading from the Auburn-Opelika area and sedimentation from forestry practices downstream are probably the primary sources of impairment in the Sougahatchee Watershed. The intent of the study was to identify those factors that are adversely affecting the water quality and biological integrity of the watershed. Currently, 67 percent of the land cover is forestry, but increasing urban growth is forecast for the Auburn-Opelika area.

Lower Tallapoosa Reservoir Studies

*The trophic state index (**TSI**) is a measure of eutrophication using a combination of measures of turbidity, chlorophyll a concentrations, and total phosphorus levels.*

According to *Alabama's 2004 Integrated Water Quality Monitoring and Assessment Report* (ADEM, 2004), Yates Reservoir is considered to be mesotrophic, with August/September TSIs of 45. Thurlow is designated as an oligotrophic reservoir, with a TSI of 38. A water body is considered to be oligotrophic if its TSI is less than 40. A lake that is oligotrophic is poor in nutrients and rich in oxygen. A reservoir is mesotrophic if the TSI is between 40 and 49. A mesotrophic lake is characterized by moderate nutrient concentrations and significant productivity. ADEM's report also displays charts with August mean TSIs for the past

18 years. The lower Yates Reservoir shows an increasing TSI, but Yates (Sougahatchee Creek Embayment) shows a decline from a hypereutrophic state to eutrophic. Lower Thurlow Reservoir shows an increase from oligotrophic to mesotrophic. The Sougahatchee Creek Embayment, which drains into the Yates Reservoir, has been placed on Alabama's §303(d) list for nutrients and OE. This embayment may account for the increasing TSI in both reservoirs.

The *Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs* (ADEM, 1997) discusses intensive monitoring of reservoirs in both the Coosa and Tallapoosa basins to establish a baseline of data in anticipation of water diversion activities in Georgia. According to this report, total nitrogen concentrations were higher in the Sougahatchee Creek Embayment and in the lower Yates Reservoir than in any of the other reservoirs in the Tallapoosa Basin. This situation was partially accredited to Sougahatchee Creek, which flows into Yates. The total phosphorus concentrations in the Sougahatchee Creek Embayment and lower Yates, combined with the upper Harris Reservoir, were the highest in the basin. This situation also was attributed to the influence of Sougahatchee Creek. Algal growth potential tests were performed, and it was determined that the Sougahatchee Creek Embayment exceeds the maximum level established by ADEM to protect water bodies from excessive algal blooms and fish kills. Chlorophyll a concentrations were measured, and the highest levels were found in the Sougahatchee Creek Embayment. In the Yates Reservoir, TSI values were found to generally increase from July until September. DO concentrations never fell below the water quality standard of 5.0 mg/L, and anoxic conditions never occurred in the water column of the lower Yates Reservoir. Although not specifically mentioned in the report, the potential source of nutrient enrichment in the Sougahatchee Creek watershed is likely to be traced back to the Auburn-Opelika urban area. The Sougahatchee Creek Embayment (Yates Reservoir) and Pepperell Branch Phase I Draft TMDL (ADEM, 2003) recommends a 39-percent reduction in phosphorus from both point sources and NPSs.

***Algal growth potential** is the maximum algal dry weight biomass production in a natural water sample under laboratory conditions.*

Although there are eight permitted wastewater dischargers, the point source load is expected to decrease with the addition of the constructed wetland that WestPoint Stevens has added to one of its plants for tertiary treatment and the diversion of a portion of the City of Auburn's Northside WWTP flow. Point source dischargers are listed in Exhibit 6-5.

EXHIBIT 6-5
Point Sources in the Sougahatchee Creek Watershed
Tallapoosa River Basin Management Plan

Facility	Permit	Type	Receiving Water
Opelika Westside WWTP	AL0050130	Municipal	Pepperell Branch
Auburn Northside WWTP	AL0050245	Municipal	Sougahatchee Creek
The Colony Apartments	AL0045641	SPP	Unnamed Tributary to Sougahatchee Creek
WestPoint Stevens Grifftex Chem	AL0001074	Industrial (Minor)	Pepperell Branch

EXHIBIT 6-5
Point Sources in the Sougahatchee Creek Watershed
Tallapoosa River Basin Management Plan

Facility	Permit	Type	Receiving Water
WCB Alabama, Inc.	AL0002194	Industrial (Minor)	Pepperell Branch
Quantegy, Inc.	AL0003310	Industrial (Minor)	Pepperell Branch
WestPoint Stevens Filter	AL0024198	Industrial (Minor)	Pepperell Branch
WestPoint Stevens	AL0002968	Industrial (Major)	Pepperell Branch

Notes:
WWTP = wastewater treatment plant
SPP = semi-private/public
Source: Phase I Draft Total Maximum Daily Load Nutrients and OE/DO Pepperell Branch (AL/03150110-030_01) Nutrients–*Sougahatchee* Creek Embayment (Yates Reservoir) (AL/Yates Res_01) Nutrients and OE/DO (ADEM, October 2003).

The Thurlow Reservoir also was studied. Nutrient concentrations in this reservoir were higher than in several other Tallapoosa Reservoir locations. This situation was attributed to high concentrations of nutrients flowing from Yates to Thurlow. The algal growth potential tests did not indicate the potential for nuisance algal blooms and fish kills. The TSI values were similar to those from the lower Yates Reservoir. The higher chlorophyll *a* concentrations were considered to be due to Yates Reservoir. The DO concentrations never fell below the water quality standard, and just as with Yates, anoxic conditions did not occur.

Surface Water Quality Screening Assessment

The *Surface Water Quality Screening Assessment of the Tallapoosa River Basin* (ADEM, 2000) reviews a variety of data to assess the subwatersheds in the Tallapoosa Basin. Calebee Creek was the only subwatershed in the Lower Tallapoosa that was identified as a priority watershed in this assessment. Biological impairment was identified at Tallassee Creek, and the habitat assessment score was poor because of bank instability and low riparian measurements. Runoff from pastureland and forestland was the primary NPS concern.

State Parks Monitoring Program

The State Parks Monitoring program was performed to support Alabama's watershed management strategy, which assesses water quality in the state parks, identifies impairments, and finds streams that could be considered for an upgrade to the OAW classification. Two sites in Chewacla State Park and four other sites in the Chewacla Creek subwatershed were monitored. Exhibit 6-6 illustrates these locations.

Insert Exhibit 6-6, Chewacla State Park Monitoring Locations

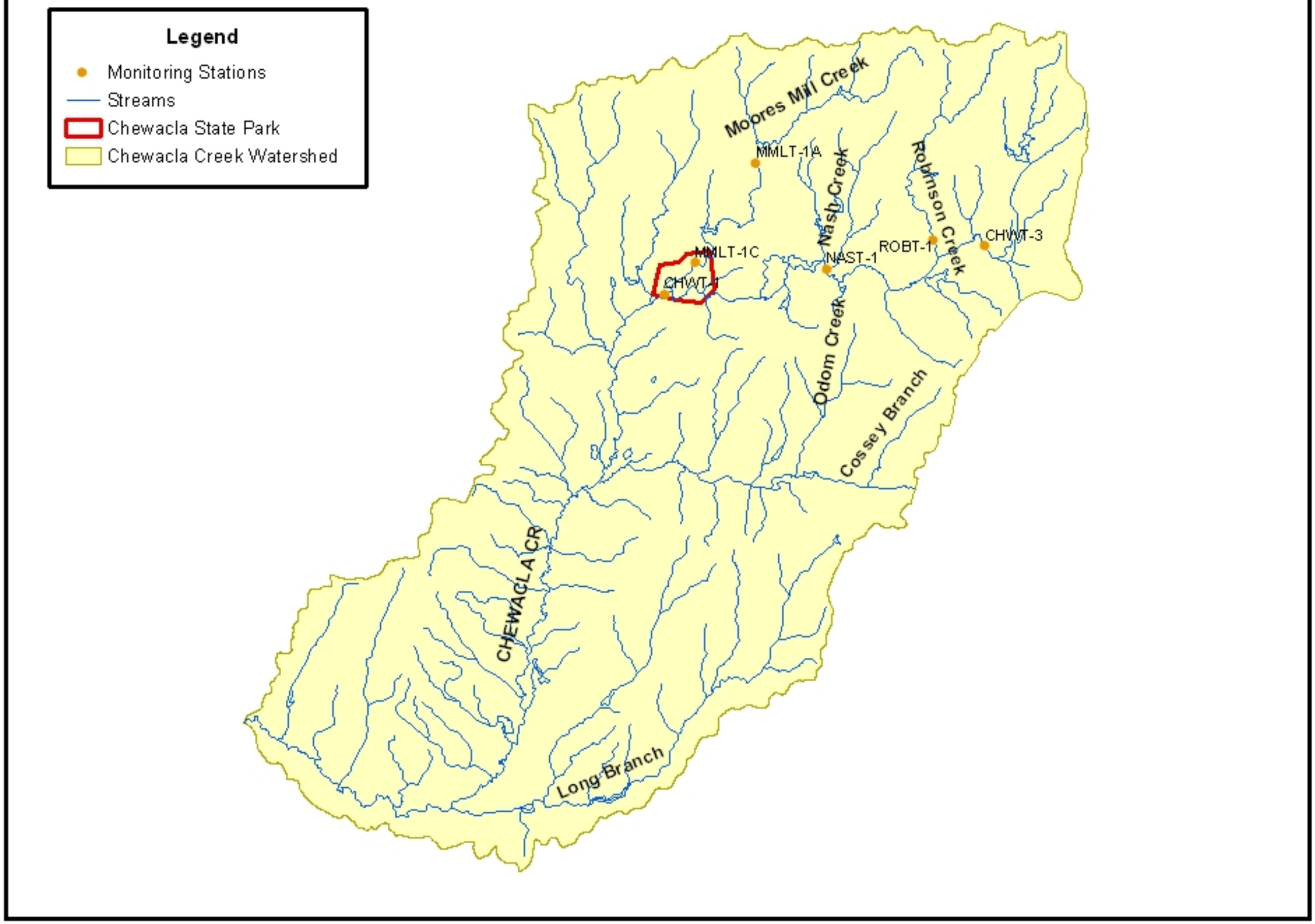


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Exhibit 6-6
Chewacla State Park Monitoring Locations
Tallapoosa River Basin Management Plan

The downstream site on Chewacla Creek that was in the park had excellent habitat, fair macroinvertebrate, and poor/fair fish scores. Total dissolved solids (TDS) and conductivity were found higher than at the upstream site, as were nutrients in the spring and fall. The Moores Mill Creek site that was sampled in the State Park had good habitat, poor macroinvertebrate, and fair fish scores, and no water quality impairment. The other sites outside of the park had mostly good habitat scores, good or fair macroinvertebrate scores, and primarily fair fish IBI scores. The only indication of poor water quality was the sediment deposition downstream of the monitoring sites and elevated fecal coliform concentrations.

Alabama Water Watch (AWW) Program

In the Lower Tallapoosa, the AWW program is actively supported by eight different AWW groups, as listed in Exhibit 6-4. Conclusions from the Tri-River Region group's water quality monitoring records are contained in the report, *Citizen Volunteer Water Quality Monitoring of Alabama's Reservoirs, Volume 1: Tri-River Region (Montgomery Area)* (Deutsch, 2003). There are plans to produce similar reports for the Save our Saugahatchee and Friends of Uphapee Creek groups.

Alabama Report to Congress

ADEM's 2004 §305(b) Report to Congress states that Yates Reservoir is mesotrophic, based on the mean TSI values collected in August and September 1985 through the present in the dam forebay. Yates Reservoir is not considered to be fully supporting its water use classification. It is on Alabama's §303(d) list for nutrients and OE/low DO. Thurlow Reservoir is the only reservoir in the state that is classified as oligotrophic. Thurlow Reservoir is fully supporting its water use classification.

Fish Tissue Surveys

ADEM conducts annual fish tissue sample surveys in lakes and rivers across the state. The sample fish tissues collected through this survey are analyzed for the presence of toxic substances. The results from these analyses are used as the basis for the fish consumption advisories issued by ADEM. In FY 2003, no fish consumption advisories were issued for Yates Reservoir, Thurlow Reservoir, or the Tallapoosa River.

USGS Data

Data were obtained from the following USGS stations: 02418230 (Sougahatchee Creek at Co. Rd. 188 near Loachapoka, Alabama), 02418500 (Tallapoosa River below Tallassee, Alabama), 02418760 (Chewacla Creek at Chewacla State Park near Auburn, Alabama), 02419000 (Uphapee Creek near Tuskegee, Alabama), 02419500 (Tallapoosa River at Milstead, Alabama), and 02419890 (Tallapoosa River near Montgomery–Montgomery Water Works, Alabama). The parameters consisted of flow, temperature, specific conductivity, discharge, DO, chemical oxygen demand, pH, carbonates, hardness, nutrients, metals, and solids. Data collection began as early as 1897 and as late as 1999, and real time flow continues to be collected. None of the USGS data indicate water quality impairments.

Biotic Species Information

There are many aquatic species endemic to the Lower Tallapoosa. In 1985, an aquatic plant survey was performed by the ADCNR. Listed below are some of the species that were identified:

Yates Reservoir

- Slender spikerush
- Parrot feather
- Spiny lead naiad
- Stonewort
- Small pond weed
- Sago pond weed
- Eel grass

Thurlow Reservoir

- Slender spikerush
- Parrot feather
- Stonewort
- Small pond weed
- Eel grass
- Bladderwort

Periodic inventories of fish populations in Yates and Thurlow reservoirs have been conducted by the Fisheries Section of the ADCNR. The purpose of these reports is to collect detailed inventories of fish populations and diversity in major lakes to assist the district biologist in determining management strategies to enhance the fishery. These reservoirs support a wide range of fish species, as verified by the *Yates Reservoir Management Report* and *Thurlow Reservoir Management Report,* prepared by the Fisheries Section of ADCNR annually. The survey information is supplemented by bass tournament information collected through B.A.I.T. According to the March 15, 1995, report, 19 species of fish were identified in Yates and 16 species in Thurlow. The 5 predominant species of fish in both lakes are largemouth bass, spotted bass, bream, crappie, and striped bass. Other fish species found to inhabit the lakes include bluegill, redear sunfish, threadfin shad, gizzard shad, redbreast sunfish, longear sunfish, warmouth, channel catfish, yellow bullhead, brown bullhead, blacktail redhorse, black redhorse, spotted sucker, blacktail shiner, notropis sp., and logperch.

The Lower Tallapoosa River section has 13 known T&E species. These plant and animal species are listed in Exhibit 6-7.

EXHIBIT 6-7
Threatened and Endangered Species in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Species Common Name	Scientific Name	Designation
Alabama canebrake pitcher plant	*Sarracenia rubra ssp. Alabamaensis*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Eastern indigo snake	*Drymarchon corais couperi*	Threatened
Fine-lined pocketbook mussel	*Lampsilis altilis*	Endangered
Gopher tortoise	*Gopherus polyphemus*	Threatened
Ovate clubshell mussel	*Pleurobema perovatum*	Endangered

EXHIBIT 6-7
Threatened and Endangered Species in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

Species Common Name	Scientific Name	Designation
Red-cockaded woodpecker	*Picoides borealis*	Endangered
Relict trilium	*Trillium reliquum*	Endangered
Wood stork	*Mycteria americana*	Endangered

Watershed Assessment

An assessment of water quality and biological concerns was performed on the water bodies in the Lower Tallapoosa watershed. Water quality and biological data were obtained from the data sources listed in Exhibit 6-4. In addition, input was gathered from stakeholders during the Lower Tallapoosa CWP meetings held from July 2003 through July 2004. For each concern identified, a potential source was determined and a priority ranking was established.

§303(d) Listed Streams

All stream segments and reservoirs in the Lower Tallapoosa that are on the Draft 2004 §303(d) List (Appendix B), as discussed below, were considered to be known water quality or biological concerns because data exist to support that claim, as well as acknowledgement from ADEM that an impairment exists. The causes and sources identified in the §303(d) list were used for the assessment (Exhibit 6-8). The methodology used to prioritize the concerns is discussed in "Prioritized Watersheds" (p. 6-27).

Water Quality and Biological Concerns

Observations by stakeholders who have local knowledge of watersheds, known issues that may become serious in the future, and other anecdotal information are listed in Exhibit 6-9 and considered to be potential concerns**.** Items in Exhibit 6-9 for which there are some water quality or biological data are discussed below. **For all other concerns, there are no water quality or biological data to support these concerns.** The SWCD county watershed assessments and/or the ADEM screening assessment were used as a foundation for stakeholder input to develop this list.

Sougahatchee Creek Subwatershed

In the Sougahatchee Creek Watershed, there are two TMDLs (Yates Reservoir/ Sougahatchee Creek Embayment and Pepperell Branch). The primary causes of known water quality and biological concern are OE/low DO, nutrient enrichment, pH, habitat alteration, and temperature.

The Lower Tallapoosa CWP attributes potential sources of low DO to be from failing septic tanks, SSOs, silviculture, or urban storm water runoff from construction activities. Low DO

EXHIBIT 6-8
Lower Tallapoosa Impaired Water Bodies from the Draft 2004 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

Water Body Name	Causes	Sources	TMDL Status
Yates Reservoir (Saugahatchee Creek Embayment)	Nutrient enrichment	Industrial	TMDL (2003)
	Organic enrichment/low DO	Municipal	
		Non-irrigated crop production	
		Pasture grazing	
Pepperell Branch	Nutrient enrichment	Industrial	TMDL (2003)
Calebee Creek	Siltation	Agricultural land	TMDL (2003)
	Other habitat alteration	Surface mining	
Cubahatchee Creek	Siltation	Agricultural land	TMDL (2003)
	Other habitat alteration	Surface mining	
Line Creek[1]	Siltation	Agricultural land	TMDL (2003)
	Other habitat alteration	Surface mining	
Moores Mill Creek	Siltation	Land development	TMDL (2003)
		Urban runoff/storm sewers	

Notes:
[1] Line Creek has two separate stream segments listed, one from the Tallapoosa River to Johnsons Creek, the other from Johnsons Creek to Panther Creek. The latter is not listed for other habitat alteration.
DO = dissolved oxygen
TMDL = total maximum daily load
DO = dissolved oxygen
Source: ADEM, 2004.

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Calebee Creek	Low DO	Surface mining Agricultural land Flooding Livestock Dirt roads/roadbanks	Yes	High
Calebee Creek	pH	Surface mining Cropland	Yes	High
Calebee Creek	Habitat alteration	Surface mining Flooding Livestock	Yes	High
Calebee Creek	Temperature	Clearing for high voltage lines Surface mining Construction	Yes	High
Calebee Creek	Siltation	Surface mining Flooding Livestock Cropland Dirt roads/roadbanks	Yes	High
Calebee Creek	Pathogen contamination	Livestock Septic tanks University farm WWTP	No	High
Calebee Creek	Other	Illegal dumping	No	High
Calebee Creek	Nutrient enrichment	Livestock Septic tanks University farm WWTP	No	High
Channahatchee Creek	Nutrient enrichment	Livestock Septic tanks	No	Low
Channahatchee Creek	Pathogen contamination	Livestock Septic tanks	No	Low
Channahatchee Creek	Siltation	Livestock Cropland Streambanks	No	Low
Chewacla Creek	Low DO	Urban development Drought Livestock Dirt roads/roadbanks Streambanks Silviculture WWTP lagoon Surface mining	Yes	Medium

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Chewacla Creek	Habitat alteration	Urban development Drought Livestock Streambanks Silviculture Surface mining	Yes	Medium
Chewacla Creek	Siltation	Urban development Livestock Urban development Dirt roads/roadbanks Streambanks Silviculture Surface mining	No	Medium
Chewacla Creek	Nutrient enrichment	Livestock Storm water runoff from golf courses Septic tanks WPCF lagoon	No	Low
Chewacla Creek	Other	Illegal dumping	No	High
Chewacla Creek	Pesticides	Golf courses	No	Low
Chewacla Creek	pH	Surface mining	No	Low
Chewacla Creek	Pathogen contamination	Livestock Municipal pump stations Septic tanks WPCF lagoon	No	Low
Chewacla Lake	Siltation	Urban development Removal of Lake Wilmore (primary source)	No	Low
Chubbehatchee Creek	Low DO	Low flow	Yes	Low
Chubbehatchee Creek	Siltation	Urban development Silviculture Surface mining Dirt roads/roadbanks Road crossings	No	Low
Chubbehatchee Creek	Pathogen contamination	Livestock	No	Low
Chubbehatchee Creek	Habitat alteration	OHVs Surface mining Road crossings	No	High
Cubahatchee Creek	Low DO	Surface mining Agricultural land Low flow Naturally occurring	Yes	High (at the outlet of the watershed)

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Cubahatchee Creek	pH	Surface mining	Yes	High (at the outlet of the watershed)
Cubahatchee Creek	Siltation	Surface mining	Yes	High (at the outlet of the watershed)
Cubahatchee Creek	Habitat alteration	Surface mining	Yes	High (at the outlet of the watershed)
Cubahatchee Creek	Pesticides	Cropland	No	Medium
Cubahatchee Creek	Pathogen contamination	Livestock Septic tanks WWTP	No	High
Cubahatchee Creek	Other	Illegal dumping	No	High
Cubahatchee Creek	Nutrient enrichment	Livestock Septic tanks WWTP	No	High
Goodwater Creek	Low DO	Flood irrigation–field leveling	Yes	Low
Goodwater Creek	pH	Erosion of clay layer (ecoregion change) Unknown source	Yes	Low
Goodwater Creek	Siltation	Urban development Surface mining Gullies Silviculture Critical areas	No	Medium
Graveyard Creek	Pathogen contamination	SSOs	Yes	High
Graveyard Creek	Nutrient enrichment	SSOs	Yes	High
Harwells Mill Creek	Low DO	Cropland Low flow Road construction	Yes	High
Harwells Mill Creek	Siltation	Urban development Surface mining Silviculture Critical areas	No	High
Harwells Mill Creek	Habitat	Surface mining Irrigation	No	Low

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Harwells Mill Creek	Nutrient enrichment	Poultry Septic tanks	No	Low
Harwells Mill Creek	Pathogen contamination	Poultry Septic tanks	No	Low
Jenkins Creek	Low DO	Urban development	Yes	Medium
Jenkins Creek	Siltation	Flooding Livestock Urban (commercial) development Dirt roads/roadbanks Streambanks Critical areas Cropland	No	Medium
Jenkins Creek	Pathogen contamination	Livestock WWTP lagoon	No	Low
Jenkins Creek	Nutrient enrichment	Livestock WWTP lagoon	No	Low
Line Creek	Siltation	Surface mining Agricultural land Cropland Gullies Livestock Silviculture Critical areas Dirt roads/roadbanks	Yes	High (at the outlet of the watershed)
Line Creek	Habitat alteration	Surface mining Silviculture	Yes	High (at the outlet of the watershed)
Line Creek	Low DO	Surface mining Agricultural land Cropland Livestock	Yes	High (at the outlet of the watershed)
Line Creek	Other	Illegal dumping	No	High
Line Creek	Pathogen contamination	Septic tanks Livestock	No	Medium
Loblockee Creek	Low DO	Drought	Yes	Medium
Loblockee Creek	pH	Unknown	Yes	Medium
Loblockee Creek	Habitat alteration	Unknown Drought	Yes	Medium
Marl Creek	Siltation	Cropland Road construction	No	High

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Miller (Millies) Creek	Low DO	Naturally occurring Highway construction	Yes	Medium
Miller (Millies) Creek	Siltation	Flooding Urban development Critical areas Cropland Streambanks Gullies Surface mining Dirt roads/roadbanks	No	Medium
Miller (Millies) Creek	Pathogen contamination	Septic tanks WWTP Package plant	No	Medium
Miller (Millies) Creek	Nutrient enrichment	Septic tanks WWTP (taken offline) Fertilizers Package plant	No	Medium
Miller (Millies) Creek	Habitat alteration	Urban development	No	Medium
Moores Mill Creek	Siltation	Urban development Urban runoff/storm sewers Land Clearing	Yes	High
Old Town Creek	Siltation	Livestock Dirt roads/roadbanks Cropland	No	Low
Old Town Creek	Pathogen contamination	Livestock Septic tanks Poultry WWTP land application	No	Low
Old Town Creek	Other	Illegal dumping	No	Medium
Old Town Creek	Nutrient enrichment	Livestock Septic tanks Poultry WWTP land application	No	Low
Opintlocco Creek	Siltation	Agricultural land Dirt roads/roadbanks Flooding Livestock Gullies Surface mining Streambanks Silviculture	No	Low
Opintlocco Creek	Other	Illegal dumping	No	High

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Opintlocco Creek	Nutrient enrichment	Livestock Flooding Septic tanks	No	Low
Opintlocco Creek	Pathogen contamination	Livestock Flooding Septic tanks	No	Low
Opintlocco Creek	Low DO	Wetlands	No	Low
Opintlocco Creek	pH	Surface mining	No	Low
Parkerson Mill Creek	Siltation	Urban development	No	Low
Pepperell Branch	Nutrient enrichment	Septic tanks Sanitary sewer overflows Gray water from low-income housing Storm water runoff (construction)	Yes	High
Pepperell Branch	Low DO	Septic tanks Sanitary sewer overflows Storm water runoff (construction)	Yes	Medium
Pepperell Branch	pH	Unknown	Yes	Low
Pepperell Branch	Habitat alteration	Storm water runoff (construction)	Yes	High
Sougahatchee Creek	Siltation	Livestock Flooding Agricultural land Dirt roads/roadbanks Urban development Septic tanks Cropland Silviculture	No	Medium
Sougahatchee Creek	Low DO	Livestock Flooding Agricultural land Dirt roads/roadbanks Urban development Naturally occurring Pigs Septic tanks Silviculture WWTP WPCF	Yes	Medium

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Sougahatchee Creek	pH	Naturally occurring Illegal dumping Cropland	Yes	Medium
Sougahatchee Creek	Temperature	Timbering	Yes	Medium
Sougahatchee Creek	Other	Illegal dumping	No	High
Sougahatchee Creek	Nutrient enrichment	Livestock Agricultural land Pigs Septic tanks Cropland WWTP WPCF	No	Medium
Sougahatchee Creek	Pathogen contamination	Livestock Pigs Septic tanks Silviculture WWTP WPCF	No	Medium
Sougahatchee Creek	Pesticides	Agricultural land Cropland	No	Medium
Stone Creek	Nutrient enrichment	Livestock	No	Low
Stone Creek	Other	Illegal dumping	No	High
Stone Creek	Pathogen contamination	Livestock WWTP Septic tanks	No	High
Stone Creek	Siltation	Cropland Agricultural land Dirt roads/roadbanks Livestock Critical areas Gullies	No	Low
Tallapoosa River	Nutrient enrichment	Livestock Flooding WWTP Septic tanks	No	Low
Tallapoosa River	Pathogen contamination	Livestock Flooding WWTP Septic tanks	No	Low

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Tallapoosa River	Siltation	Flooding Livestock Surface mining Irregular water levels Dirt roads/roadbanks Cropland	No	Low
Tallapoosa River	Other	Illegal dumping	No	High
Tallapoosa River	Pesticides	Cropland	No	Low
Tumkeehatchee Creek	Low DO	Wetlands Drought Naturally occurring	Yes	Low
Tumkeehatchee Creek	Pathogen contamination	Animal waste Livestock Lagoon sprayfield Septic tanks	No	Low
Tumkeehatchee Creek	Other	Illegal dumping	No	High
Tumkeehatchee Creek	Siltation	Flooding Livestock Cropland Critical areas Streambanks	No	Low
Tumkeehatchee Creek	Low DO	Wetlands Lagoon sprayfield	No	Low
Tumkeehatchee Creek	Nutrient enrichment	Livestock Animal waste Lagoon sprayfield Septic tanks	No	Low
Tumkeehatchee Creek	Habitat alteration	Urban development	No	Low
Unnamed Tributaries to Chewacla Creek	Low DO	Surface mining Septic tanks Municipal pump stations	Yes	Medium
Unnamed Tributaries to Chewacla Creek	Fecal coliform	Septic tanks Municipal pump stations	Yes	Medium
Unnamed Tributaries to Chewacla Creek	Low pH	Surface mining	Yes	Medium
Uphapee Creek	Low DO	OHVs Low flow	Yes	Medium
Uphapee Creek	Pathogen contamination	Livestock Septic tanks WWTP lagoon	No	Low

EXHIBIT 6-9
Lower Tallapoosa Watershed Potential Water Quality and Biological Concerns as Identified by Stakeholders
Tallapoosa River Basin Management Plan

Watershed Name	Water Quality/Biological Concern (s)	Potential Source (s)	Date	Priority
Uphapee Creek	Other	Illegal dumping	No	High
Uphapee Creek	Siltation	Livestock Surface mining Agricultural land Dirt roads/roadbanks Urban development Cropland Gullies Silviculture OHVs	No	Low
Uphapee Creek	Pesticides	Treatment near power lines Golf courses Cropland	No	Low
Uphapee Creek	Nutrient enrichment	Livestock Septic tanks Fertilizer WWTP lagoon	No	Low
Uphapee Creek	Habitat alteration	Flooding	No	Medium
Wallahatchee Creek	Low DO	Wetlands Drought Naturally occurring	Yes	Low
Wind Creek	Nutrient enrichment	Livestock	No	Low
Wind Creek	Pathogen contamination	Livestock	No	Low
Wind Creek	Siltation	Agricultural land Dirt roads/roadbanks Livestock Streambanks	No	Low
Wind Creek	Other	Illegal dumping	No	High
Yates Reservoir (*Sougahatchee* Creek Embayment)	Organic enrichment/low DO	Municipal Pasture grazing Septic tanks Storm water runoff (construction)	Yes	High
Yates Reservoir (Sougahatchee Creek Embayment)	Nutrient enrichment	Pasture grazing Septic tanks	Yes	High

Notes:
DO = dissolved oxygen
WWTP = wastewater treatment plant
WPCF = water pollution control facility
OHV = off highway vehicles
SSO = sanitary sewer overflow

measurements were obtained almost 43 percent of the time (6 out of 14 measurements) from 1997 through 2000 at an ADEM station, PPLL-2 (Pepperell Branch at U.S. Highway 29). Other ADEM monitoring stations in this subwatershed revealed DO concentrations greater than the water quality standard of 5 mg/L. Save Our Saugahatchee (an AWW group) detected low DO at two stations on Pepperell Branch, 07011003 (Pepperell Branch at Hamilton Road Crossing, Opelika, Alabama) and 07011004 (Pepperell Branch at Waverly Parkway) in 1997 to 1998 and 2001. Low DO was observed at these two stations an average of 20 percent of the time (12 out of 60 measurements) between 1997 and 2002. Recent water quality data gathered by Auburn University at two locations on Pepperell Branch (upstream and downstream of WestPoint Stevens outfall) show low DO 3 percent of the time (3 out of 93 measurements) from 2000 to 2002. DO in the Pepperell Branch subwatershed appears to be improving.

Poor benthic assessment scores were determined at three ADEM monitoring stations in the Pepperell Branch watershed, PPLL-1 (Pepperell Branch at Thomason Road), PPLL-3 (Pepperell Branch at U.S. Highway 280), and PPLL-5.

One ADEM station, Yates-2 (Tallapoosa River at the Sougahatchee Creek Embayment) in the Sougahatchee Creek subwatershed, had a single DO measurement that fell below the water quality standard of 5 mg/L. This measurement occurred in August 1997. Six AWW (League of Women Voters [LWV] and Save Our Saugahatchee) monitoring locations also identified low DO an average of about 9 percent of the time (17 out of 200 measurements) at the following locations: 07002005 (Saugahatchee Lake at the boat dock), 07011002 (Saugahatchee Creek at County Road 65), 07011005 (Saugahatchee Creek at Moss Flat, Notasulga, Alabama), 07011009 (Saugahatchee Creek at U.S. Highway 280), 07011013 (Saugahatchee Creek 100 feet downstream of Lovelady Bridge), and 07011014 (Saugahatchee Creek at headwaters). Between 2000 and 2002, nine locations on the main stem of the Sougahatchee Creek were monitored by Auburn University. Low DO was observed 2 percent of the time (8 out of 420 measurements). The potential sources identified are livestock, flooding, agricultural land, dirt roads/roadbanks, urban development, natural conditions, pigs, failing septic tanks, silviculture, and WWTPs and water pollution control facilities (WPCFs).

High temperature measurements were observed at two Save Our Saugahatchee stations, 07011012 (Saugahatchee Creek at Golden Mill Bridge off Highway 49) and 07011015 (Saugahatchee Lake at Boat Dock) an average of 5 percent of the time (2 out of 37 measurements) in 2002 and 1999. It was determined that the potential source is silvicultural operations.

In Loblockee Creek, one low DO measurement was taken at an ADEM station (LOBL-1 [Loblockee Creek at Lee County Road 54]) and at a Save Our Saugahatchee station (07011008 [Loblockee Creek at Mirachi Property]), both in 2000. The potential source was determined to be drought related.

Elevated pH measurements were observed at an ADEM station, LOBL-1, 25 percent of the time (2 out of 8 measurements) in 2000 and 2001. The cause is unknown.

ADEM assigned a fair benthic score to station LOBL-1 in 2000. The source is unknown.

Chewacla Creek Subwatershed

DO, habitat alteration, siltation (TMDL), fecal coliform, and pH are the primary water quality and biological concerns in the Chewacla Creek subwatershed. The headwaters are located in the Auburn-Opelika area, but the remaining subwatershed is fairly uninhabited.

Low DO was detected at five stations on Chewacla Creek and four tributaries to Chewacla Creek. Three AWW (Chewacla Water Watch [CHEW] and Friends of Chewacla-Uphapee Watershed [CHEWUP]) stations (07016003 [Chewacla Creek at Mitchell Mill], 07016005 [Chewacla Creek below Chewacla Dam], and 07017002 [Unnamed Creek at Shell Toomer Parkway]), detected low DO about 13 percent of the time (10 out of 75 measurements) in 2000 and 2002. Six AWWB stations (C5 [Chewacla Creek at Whatley Farm near Lee County Road 112], C7 [Chewacla Creek downstream from Highway 51], C8 [Chewacla Creek above bridge at Lee County Road 146 near Plant World Nursery], T1 [Nash Creek upstream from intersection with Chewacla Creek at Lee County Road 54/Society Hill Road], T12N [Tributary to Chewacla Creek upstream of Highway 51 bridge crossing Robinson Creek], and T22 [Robinson Creek downstream from lift stations near Highway 51/Marvyn Parkway]) had low DO approximately 18 percent of the time (16 out of 89 measurements) from 1998 through 2002.

Poor and fair benthic scores were observed by ADEM at three stations in the Chewacla Creek watershed–CHWL-1, CHWL-3 (Chewacla Creek immediately upstream of Moore's Mill), and CHWL-4 (Chewacla Creek at County Road 33) in 2000. Potential sources of habitat alteration were identified as urban development, drought conditions, livestock with access to streams, eroding streambanks, improper silviculture practices, and mining operations.

Fecal coliform levels above 2,000 col/mL were detected at five AWWB stations (C5, T1, T11, T14, and T22) an average of 14 percent of the time (12 out of 85 measurements) from 1998 through 2002. The potential sources identified are failing septic tanks and municipal pump stations.

Uphapee Creek Subwatershed

The Uphapee Creek subwatershed is primarily rural, with the exception of the Tuskegee area. The main concern is low DO.

Low DO was detected at an MWWSSB station, M (Uphapee Creek), approximately 11 percent of the time (2 out of 18 measurements) in 2002 through 2003. The Lower Tallapoosa CWP stakeholders have identified off-highway vehicles and low flow due to drought conditions as the potential sources.

Tumkeehatchee Creek Subwatershed

Tallassee is the primary urban area located in the western edge of the Tumkeehatchee Creek watershed. The only water quality concern identified is low DO observed at two Tri-River Region Water Watch (TRRWWW–an AWW group) stations and two MWWSSB stations. The TRRWWW stations (07009028 [Tumkeehatchee Creek at County Road 4] and 07009029 [Wallahatchee Creek at County Road 143]) revealed low DO about 10 percent of the time (5 out of 51 measurements) in 2000 through 2002. Low DO was observed at the MWWSSB stations (J [Tumkeehatchee Creek] and L [Wallahatchee Creek]) an average of 26 percent of

the time (9 out of 35 measurements) from 2002 through 2003. The potential sources for both creeks have been identified as natural circumstances such as wetlands and drought conditions.

Graveyard Creek, located in the city limits of Tallassee, has a history of SSOs. The City is planning to upgrade the water and sewer lines in order to address pathogen contamination and excess nutrients.

Calebee Creek Subwatershed

The Calebee Creek subwatershed is primarily rural, with portions of Tuskegee and several mining operations located within its boundaries. DO, habitat alteration (TMDL), siltation (TMDL), temperature, and pH are the primary water quality and biological concerns in the Calebee Creek subwatershed. Three ADEM stations (CLBM-1 [Calebee Creek at Macon County Road 67 upstream of Tuskegee], CLBM-2 [Calebee Creek at County Road 73], and CLBM-3 [Calebee Creek at U.S. Highway 80]) and one MWWSSB station (O [Calebee Creek]) observed low DO an average of 28 percent of the time (11 out of 40 measurements) from 2000 through 2002. The potential sources identified are mining operations, agricultural practices, flooding, livestock with access to streams, and runoff from dirt roads and roadbanks.

High pH, possibly caused by mining operations and cropland runoff, was detected at one ADEM station (CLBM-2) in 2001.

High temperature measurements were taken at an ADEM station, CLBM-4 (Calebee Creek at Macon County Road 40) in 2000. The source is unknown.

Goodwater Creek Subwatershed

Low DO was detected at one MWWSSB station located on Goodwater Creek (H). The DO fell below the water quality standard of 5 mg/L almost 17 percent of the time (3 out of 18 measurements) from 2002 through 2003. The potential sources identified by the Lower Tallapoosa stakeholders are flood irrigation and field leveling.

Both an MWWSSB station and a TRRWWW station observed pH values outside the water quality standard in the Goodwater Creek subwatershed. The MWWSSB station (H) had high pH values (above 8.5) 9 percent of the time (4 out of 44 measurements) in 2000, 2001, and 2003. The TRRWWW station (07009027, Goodwater Creek at County Road 4) detected low pH values approximately 11 percent of the time (3 out of 27 measurements) in 2000 and 2001. The potential source is unknown.

Cubahatchee Creek Subwatershed

DO, habitat alteration (TMDL), siltation (TMDL), and pH are the primary water quality and biological concerns in the Chewacla Creek subwatershed. Five monitoring stations located in the Cubahatchee Creek subwatershed exhibited low DO. The TRRWWW station, 07009031 (Cubahatchee Creek at U.S. Highway 80) detected low DO 4 percent of the time in 2002. Three ADEM stations, CUBM-1 (Cubahatchee Creek at Macon County Road 2), CUBM-2 (Cubahatchee Creek at Macon County Road 13) and CUBM-3 (Cubahatchee Creek at Macon County Road 7), reported low DO about 50 percent of the time in 2000. One MWWSSB station located on Cubahatchee Creek (Q) showed low DO almost 24 percent of

the time in 2002. The potential sources that have been identified are mining operations, agricultural practices, low flow due to drought, and natural low DO conditions.

Low pH measurements were taken at an ADEM station, CUBM-3, 11 percent of the time in 2000. The potential source is identified as mining operations.

Line Creek Subwatershed

The Line Creek subwatershed is primarily rural, although east Montgomery is beginning to infringe upon it, and several mining operations are located within its boundaries near the outlet. DO, habitat alteration (TMDL), and siltation (TMDL) are the primary water quality and biological concerns in the Line Creek subwatershed. The MWWSSB observed low DO at one station R (located on Line Creek) almost 17 percent of the time (3 out of 18 measurements) from 2002 through 2003. The Lower Tallapoosa stakeholders determined the potential sources to be mining operations, agricultural practices, cropland runoff, and livestock with access to streams.

Miller (Millie's) Creek Subwatershed

Miller Creek, commonly referred to as Millie's Creek, has demonstrated low DO at three TRRWWW stations and one MWWSSB station. More than 25 percent of the time, low DO was measured at 07009001 (Millie's Creek at U.S. Highway 110), 07009002 (Millie's Creek at Interstate 85), and 07009034 (Millie's Creek behind Simcala [McLemore Property]) from 1997 through 2002 about 29 percent of the time (40 out of 138 measurements). Low DO also was detected at MWWSSB station S, located on Millie's Creek, from 2002 through 2003. The stakeholders have identified the potential sources to be naturally occurring in some areas and influenced by highway construction and urban development in others.

Chubbehatchee Creek Subwatershed

The MWWSSB station G (located on Chubbehatchee Creek) measured low DO approximately 17 percent of the time (3 out of 18 measurements) from 2002 through 2003. Stakeholders determined that the potential source is low flow due to drought conditions.

Jenkins Creek Subwatershed

Low DO was observed at two monitoring locations in the Jenkins Creek watershed. The TRRWWW station, 07009007 (Jenkins Creek at Ware's Ferry Bridge), detected low DO 14 percent of the time (2 out of 14 measurements) in 1999. Dissolved oxygen below the water quality standard of 5 mg/L was observed at the MWWSSB station V (located on Jenkins Creek), about 18 percent of the time (3 out of 17 measurements) in 2002 and 2003. Stakeholders have identified the potential source as urban development.

Harwells Mill Creek Subwatershed

Low DO was detected at two MWWSSB stations in the Harwells Mill Creek subwatershed. At station B (Unnamed Creek), DO was measured below 5 mg/L 50 percent of the time (9 out of 18 measurements) from 2002 through 2003. Low DO was observed at station D (Marl Creek) 6 percent of the time (1 out of 18 measurements) from 2002 through 2003. The source is unknown.

Prioritized Watersheds

As listed in Exhibit 6-9, the Lower Tallapoosa CWP stakeholders have prioritized each concern based on §303(d) listing, TMDL status, frequency of water quality violations, and personal observations. Those water quality and biological concerns ranked high are due to §303(d) listings, recurring problems, and concerns that can be addressed easily. Concerns that are ranked medium are less immediate, more difficult to address, or have fewer data to support them. Low-priority concerns have no data to support them, are not a frequent problem, or could have been caused by drought or other naturally occurring conditions.

Watershed Management Strategies

Stakeholders have developed a list of watershed management strategies for which they can facilitate implementation. Exhibit 6-10 lists the management strategies, which are sorted by water quality or biological concerns.

EXHIBIT 6-10
Lower Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
Nutrient enrichment	Encourage the use of buffers around streambanks.
	Advocate the banning of detergents containing phosphates or taxing products with phosphates. Use education to encourage the use of phosphate-free products.
	Use federally funded cost share programs to help landowners use BMPs (waste management for animal waste).
	Employ education about septic system maintenance (Homeowners Workshop for homeowners).
	Advocate for regular/periodic inspections of septic systems.
	Search for funding for the installation of alternative waste management systems.
	Encourage septic system installers to attend onsite wastewater training.
	Promote education for septic dischargers (certification required). Use CEUs.
	Encourage the use of proper city planning and development and environmentally sensitive development (green corridors, pervious sidewalks, swales, pervious parking, etc.).
	Encourage fast-track credit for developers that use green practices (economic incentive).
	Encourage/promote recycling and reuse–promote biosolids reuse and water recycling through land application.
	Encourage the use of environmental impact fees on businesses that leave abandoned buildings.
	Educate point sources about funding to correct issues (WWTP, WWTP lagoons).

EXHIBIT 6-10
Lower Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
	Educate golf course owners by distributing BMP manuals, encourage course management workshops, and promote use of natural design (natural areas).
	Encourage homeowners to reuse gray water.
	Study phosphorus loads from clear-cut areas. Use education to encourage land objectives that would promote lighter cuts.
Pathogen contamination	Encourage the use of buffers around streambanks.
	Use federally funded cost share programs to help landowners use BMPs (waste management for animal waste).
	Employ education about septic system maintenance (Homeowners Workshop for homeowners).
	Advocate for regular/periodic inspections of septic systems.
	Search for funding for the installation of alternative waste management systems.
	Encourage septic system installers to attend onsite wastewater training.
	Promote education for septic dischargers (certification required). Use CEUs.
	Support AWW program–encourage the expansion of the program into headwaters by contacting stakeholders in the Tallassee and Tuskegee areas, continue monitoring.
	Promote and support the NRCS EQIP program.
	Apply for Section 319 grant funds where applicable.
Siltation	Promote registered forester program.
	Report failing forestry BMPs to the Inconsistent Practices system hotline.
	Encourage the use of buffers around streambanks.
	Use federally funded cost share programs to help landowners use BMPs (waste management for animal waste).
	Encourage county engineers to use and maintain proper BMPs for construction of dirt roads; sponsor the ADEM dirt road workshop.
	Report failing BMPs and other problems to DOT/County engineer representative.
	Initiate open space preservation (Land Trust of East Alabama) or environmentally sensitive development initiatives.
Low dissolved oxygen	Support AWW program–encourage the expansion of the by contacting stakeholders, continue monitoring.

EXHIBIT 6-10
Lower Tallapoosa Watershed Management Strategies
Tallapoosa River Basin Management Plan

Water Quality or Biological Concern	Management Strategies
Habitat alteration	Encourage use of conservation easements–land trusts (Land Trust of East Alabama).
	CWP members report failing BMPs/other problems to DOT/County engineer representative.
	Promote forestry commission education programs.
	Encourage Forestry Commission registered forester programs.
	Encourage the use of buffers around streambanks.
pH	Promote water quality training for master gardeners, other volunteer groups, and developers/contractors through advertisement.
	Promote incentive-based fertilizer education.
Pesticides	Educate golf course owners by distributing BMP manuals, encourage course management workshops, promote use of natural design (natural areas).
	Organize a Household and Agricultural Hazardous Waste Collection day.
	Educate general public and significant users (ALDOT) with seminars and flyers.
Other	Promote annual cleanup.
	Identify litter hot spots (research where it is coming from), report results to ADEM.
	Educate adults and contractors about illegal dumping and litter through anti-litter campaigns (use ACWP nerdy man posters, Legacy billboards, and ACWP PSAs).
	Encourage enforcement of county prima facie litter law.
	Advocate the use of bottles and cans deposits.
	Explore adoption of countywide mandatory garbage collection.
	Implement the Adopt-a-highway program.

Notes:
BMP = best management practice
CEU = continuing education unit
WWTP = wastewater treatment plant
AWW = Alabama Water Watch
NRCS = Natural Resources Conservation Service
ADEM = Alabama Department of Environmental Management
DOT = Department of Transportation
CWP = Clean Water Partnership
ACWP = Alabama Clean Water Partnership
PSA = public service announcement
EQIP = Environmental Quality Incentive Program
ALDOT = Alabama Department of Transportation

Monitoring Plan

On the basis of the known and potential concerns identified by the stakeholders, §303(d)-listed water bodies, and water quality and biological data that have been collected, the following plan for future monitoring is suggested.

Existing Monitoring

There currently are eight organizations monitoring streams and reservoirs in the Lower Tallapoosa watershed (Exhibit 6-4). Exhibit 6-11 shows the locations of those sampling sites. Five (Opintlocco Creek, Wind Creek, Tumkeehatchee Creek, Old Town Creek, and Stone Creek) of the 18 watersheds in the Lower Tallapoosa have little or no monitoring activity. The bulk of the data available are in the Auburn-Opelika and Montgomery areas.

Monitoring Objectives

- Continue to monitor the water quality and aquatic integrity of the Lower Tallapoosa watershed
- Document trends in water quality
- Monitor §303(d)-listed water bodies for improvement
- Coordinate monitoring efforts rather than duplicating them
- Document effectiveness of basin management plan
- Identify areas that need additional attention

Proposed Monitoring Approach

A monitoring plan should be developed to meet each of the objectives discussed above. The plan should outline the monitoring locations, types of monitoring, and parameters. The monitoring plan should be reviewed periodically to determine if it is meeting the objectives. In addition, watershed objectives may change over time as additional information is learned about the health of the watershed. Thus, the monitoring plan also should be reviewed in light of new information and any watershed plan objectives that may have changed. The following briefly outlines information to consider while developing a detailed monitoring plan.

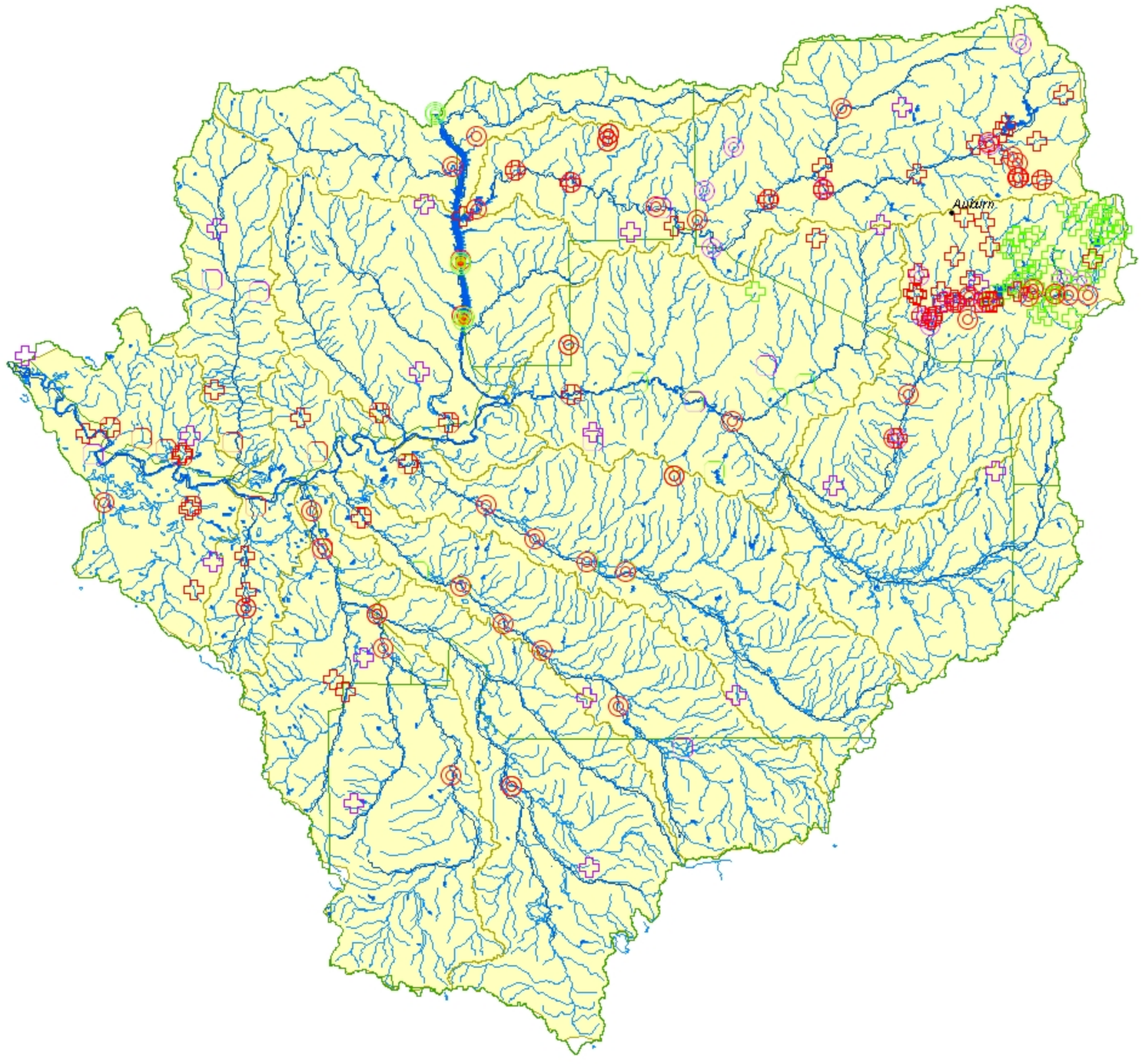
Water Quality Data

Any new water quality monitoring locations should be focused in watersheds with the least amount of data and the highest priority of concern. The southeastern and northwestern portions of the Lower Tallapoosa are the most data-poor areas. Because of the lack of inhabitants in these rural areas, it is unlikely that AWW groups will be established there. However, the Lower Tallapoosa CWP may work with universities such as Auburn and Tuskegee, as well as other state and federal organizations (ADEM, GSA, and USGS), to

Insert Exhibit 6-11, Existing Sampling Locations in the Lower Tallapoosa Watershed

Legend

- Cities
- ADEM
- APCo
- AU
- AWW
- AWWB
- GSA
- MWWSSB
- TU
- USGS
- Dams
- Lakes and Ponds
- Major Streams
- Minor Streams
- County Boundaries
- Watershed Boundaries



2 1 0 2 4 Miles

CH2MHILL

N W E S

Exhibit 6-11
Existing Sampling Locations in the Lower Tallapoosa Watershed
Tallapoosa River Basin Management Plan

encourage studies in these areas. The following parameters are suggested for future monitoring:

- *In-situ* measurements–Temperature (air and water), pH, DO, turbidity, and conductivity
- Chemical analyses–TSS, nitrate-nitrite, ammonia, total phosphorus, total hardness, BOD_5, and alkalinity

Bacteriological tests–Either fecal coliform or E. *coli*

Bioassessment Data

Organizations such as universities and state and federal agencies–and to a limited basis, citizen volunteer groups–can perform benthic macroinvertebrate, fish, and habitat assessments. Unfortunately, varying protocols are used in the State of Alabama. The methodology used by ADEM is preferred for the sake of consistency. However, EPA's approval of AWW's bioassessment methods is anticipated within the 2005 to 2006 timeframe.

Implementation Plan

Organizational Structure

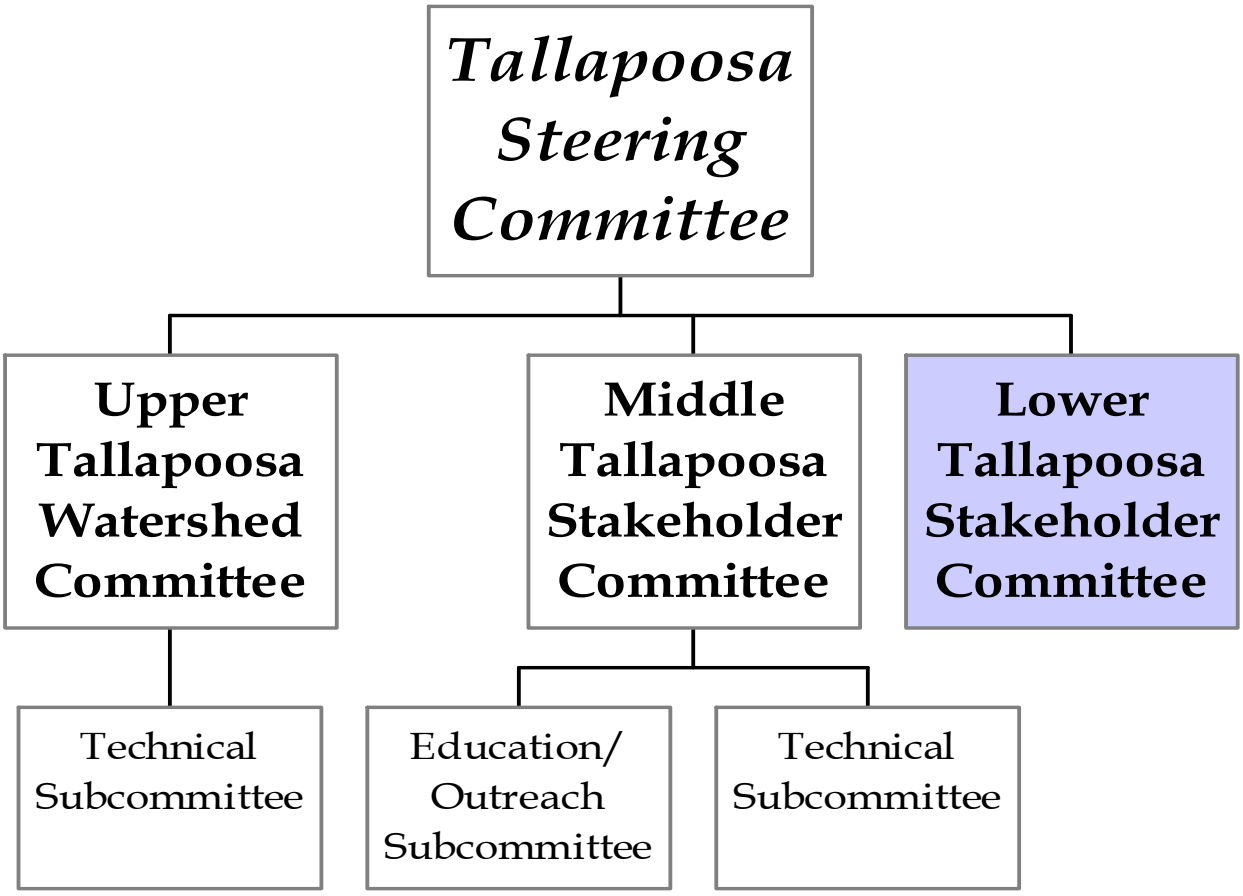
The Tallapoosa River Basin CWP is 1 of 10 basin organizations under the ACWP, which is the statewide umbrella organization. Each of the 10 basins has a facilitator who works to coordinate stakeholders in their efforts to protect and restore surface waters within their respective basins. The ACWP and each basin organization are stakeholder-based and driven. Because issues, demographics, and resources vary from basin to basin, facilitators depend on local stakeholders to identify local problems and solutions.

Participation in CWP organizations is voluntary, and most of the management strategies recommended in this plan are designed to be implemented on a voluntary basis. The exceptions are management strategies in urban areas that are related to regulatory policies, such as storm water permits. Each participating partner has the ability to either influence or control the implementation of the strategies described in Exhibit 6-9. For example, municipalities can pass local ordinances, private industries can use innovative technologies that provide better environmental protection, universities can conduct various studies, private citizens can create and implement community-based education and outreach programs, and all stakeholders can help to seek funding and other resources to support strategy implementation.

Although the watershed stakeholder groups are linked through one basinwide organization, each meets and functions independently. Some of the watershed organizations have developed subcommittees to address specific issues and tasks. The Lower Tallapoosa CWP is sponsored by the MWWSSB. The Lower Tallapoosa Stakeholder Committee meets on a quarterly basis, and the meeting locations rotate. Although the Lower Tallapoosa CWP has had both Technical and Education/Outreach subcommittees in the past, these committees currently are dormant. They will be reactivated as the need arises.

Exhibit 6-12 depicts the Tallapoosa River Basin CWP.

EXHIBIT 6-12
Tallapoosa River Basin CWP Organizational Chart
Tallapoosa River Basin Management Plan



When implementing the recommended watershed management strategies, participating stakeholders should coordinate efforts among collaborating entities and individuals to prevent the potential duplication of activities and the waste of limited resources. Stakeholders also should work to pool resources to maximize the funding and in-kind services available to support the implementation of the basin management plan. Because some management strategies are similar in the Upper and Middle Tallapoosa River watersheds, collaborative efforts among all basin stakeholders to implement these strategies are encouraged. Additionally, some strategies may be implemented through collaboration and coordination with the ACWP on a statewide basis.

Priorities

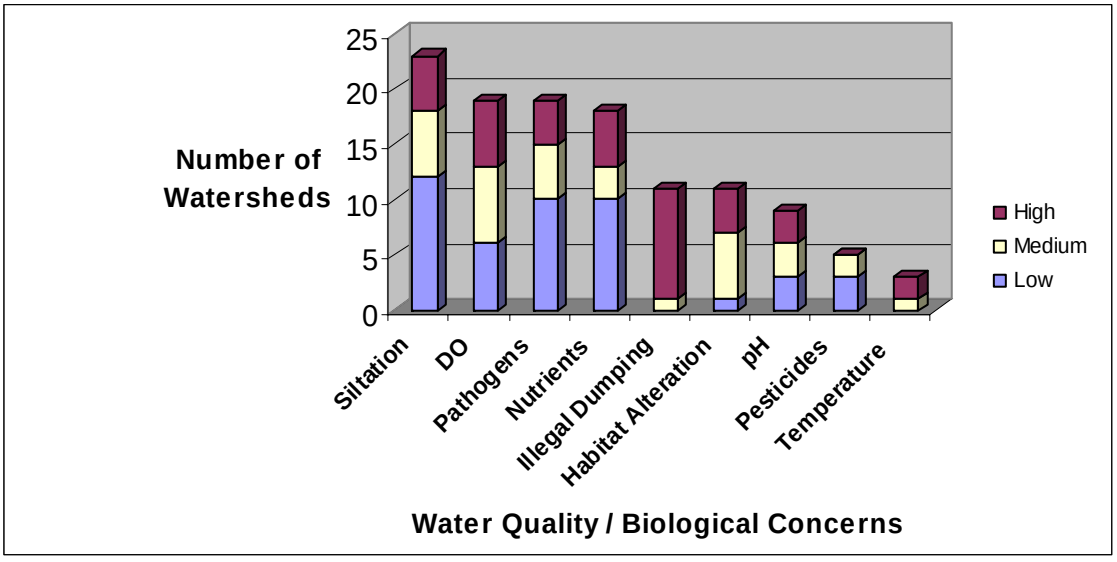
During the watershed assessment process, stakeholders have prioritized known and potential concerns. Several water bodies with known concerns in the Sougahatchee Creek Watershed were identified as high priority, as well as others in the Moore's Mill Creek, Tumkeehatchee Creek, Calebee Creek, Cubahatchee Creek, and Line Creek watersheds. The primary potential concerns are low DO, siltation, nutrient enrichment, and pathogen

contamination. Because of the limited resources, it is recommended that efforts be focused on subwatersheds with high priority concerns. Exhibit 6-13 shows the NPS water quality and biological concerns identified by stakeholders for each subwatershed. For example, siltation was identified as a concern in more than 18 subwatersheds and was prioritized as low more often than it was considered to be a high or medium concern. However, DO is a concern in fewer than 18 subwatersheds and is considered to be a high, medium, or low priority equal amounts of the time. Siltation, low DO, nutrient enrichment, and pathogen contamination were assessed as known and potential concerns in the Lower Tallapoosa watershed. Siltation was identified as a known and potential concern in all of the subwatersheds. The sources of siltation were assumed to be from surface mining, urban development, dirt roads and roadbanks, and livestock with access to streams.

Low DO was a concern in 13 of the subwatersheds (Exhibit 6-9). In the urban areas, the potential sources of low DO are urban development and storm water runoff, SSOs, and highway construction. In the rural areas of the watershed, low DO was estimated to be caused by surface mining, failing septic tank systems, livestock with access to streams, silviculture, and the presence of wetlands.

Nutrient enrichment has been identified as a concern in 15 of the subwatersheds (Exhibit 6-9). The potential sources determined by stakeholders were failing septic tank systems, SSOs, and livestock with access to streams.

EXHIBIT 6-13
Watershed Water Quality and Biological Concern Priorities
Tallapoosa River Basin Management Plan



Approach

The Lower Tallapoosa is composed of 18 eleven-digit hydrologic units and encompasses all or part of 8 counties. It is not feasible to try to implement all of the management strategies identified in Exhibit 6-9 immediately. Therefore, it is recommended that watersheds with

the most high-priority concerns be addressed first. Exhibit 6-14 provides an example of how the stakeholders in the Lower Tallapoosa watershed could proceed.

EXHIBIT 6-14
Implementation Approach
Tallapoosa River Basin Management Plan

Step	Action
Step 1	Rank or prioritize each subwatershed
Step 2	Target top three subwatersheds for implementation projects
Step 3	Establish on-the-ground projects that will address the concerns that have been identified
Step 4	Assign responsibility to stakeholders
Step 5	Determine how to fund projects
Step 6	Obtain funding
Step 7	Begin implementation

Watershed-based Plans

The ADEM Office of Education and Outreach, Nonpoint Source Unit supports the development of watershed-based plans. These plans focus in greater detail on individual subwatersheds. The first watershed-based plan to be drafted in the Tallapoosa Basin is for the Sougahatchee Creek subwatershed. Stakeholders have formed a group called Saugahatchee Watershed Management Plan (SWaMP). They have received a §319 grant to fund the development of the plan and will later apply for a §319 grant to implement it. Their goal is "to develop a comprehensive management plan for the Saugahatchee Watershed integrating current scientific data and existing plans in cooperation with a multi-sectorial group of stakeholders." This more detailed plan is not intended to replace the basinwide plan; rather, it is intended to supplement it by focusing the efforts of the stakeholders on an individual subwatershed and allowing them to demonstrate improved water quality. ADEM will consider funding the development and implementation of these plans for water bodies that have TMDLs drafted. Therefore, all of the stream segments and water bodies listed in Exhibit 6-8 are eligible for §319 funding.

Education/Outreach

Stakeholder education, outreach, and training are important tools to be used for effective implementation of a basin management plan. The public is often unaware that the combined efforts of their actions can cause significant nonpoint source pollution problems. Proper education for day-to-day activities such as using appropriate amounts of fertilizer, recycling of motor oil, and collecting and proper disposal of pet waste can have a tremendous effect on the reduction of NPS pollutant loadings to local water bodies. Stakeholders must be provided with good information and resources to increase awareness of water quality problems. Informed watershed users and concerned citizens are more conscious of how

their activities affect the water they depend on and are more willing to modify their activities to meet water quality goals.

Education and outreach can be carried out by agencies (local, statewide, or national) or by volunteers. A few of the methods used to provide educational information to the public include television, radio and newspaper announcements or stories, flyers, community newsletters, workshops and seminars, and teacher in-service programs. Individuals also receive information through participation in citizen-based watershed stewardship groups and volunteer monitoring programs. Partnerships among various stakeholders and interest groups are key to long-term water quality improvements. Many consider education and outreach to be one of the most effective tools to help improve water quality.

Several education and outreach activities are used in the Lower Tallapoosa watershed. In this watershed, OE/low DO, siltation, pathogen contamination, and nutrient enrichment are the primary concerns that have been identified by stakeholders (Exhibits 6-9 and 6-10).

Ongoing Activities

Several education and outreach activities have been used in the Lower Tallapoosa watershed. Siltation, DO, pathogens, and nutrients are the primary concerns that have been identified by stakeholders (Exhibit 6-9):

- **ACWP–**This statewide organization has developed a variety of educational materials to be used in each of the ACWP river basins. In the Lower Tallapoosa watershed, brochures and other printed handouts, a "Nerdy Man" public relations campaign, public service announcements, and videos have been used. Through the ACWP, brochures for each river basin that include local information have been developed and distributed. The "Nerdy Man" campaign includes billboards, television public service announcements, and posters. The goal of the campaign is to teach people how to reduce the amount of personal pollution that they impose on the environment.
- **ADEM Office of Education and Outreach–**The ADEM Office of Education and Outreach, in cooperation with Troy University Center for Research and Services, created a series of television public service announcements about NPS pollution. These were aired on local television stations in the watershed. Additionally, two TMDL videos have been developed and distributed throughout the watershed. An additional video about the ACWP organization also is being developed for distribution.
- **AWW**
  - *Education*–Volunteers work with local school children and community groups to help educate Alabama citizens about water quality and the importance of protecting our streams. Citizens of Alabama and shared watersheds of other states have been trained how to monitor and evaluate the physical, chemical, and biological features of water. This effort has led to the creation of a massive collection of citizen monitoring sites.
  - *Development of Citizen Volunteer Protocols and Educational Materials Related to Stream Macroinvertebrate Monitoring*–This 2-year project, summer 2004 through 2006, is funded by the Auburn University Environmental Institute, with partial funding from Alexander City and the Middle Tallapoosa CWP, and also combines the

resources of the AWW program office and Auburn University's Department of Curriculum and Teaching. Its goals are to establish the scientific credibility of AWW's stream bioassessment (macroinvertebrate) protocols, to increase AWW's involvement with environmental education of youth, and to promote the long-term sustainability of the AWW bioassessment program by integrating it into Auburn University's curriculum for teacher interns. The project will use AWW citizen groups (LWLM in the Middle Tallapoosa and Save Our Saugahatchee in the Lower Tallapoosa) to assist with bioassessments at selected stream sites in the Tallapoosa River Basin. Additionally, two workshops for science teacher interns will be conducted and local school groups will be able to participate in environmental education field trips associated with the planned macroinvertebrate sampling activities in the watershed.

- **NEMO**–This program was developed to educate local community leaders about how decisions related to land use planning and development that affect water quality. Trained members of a speaker's bureau, including the Tallapoosa River Basin facilitator, are available to make presentations to community groups.

- **Alabama Envirothon**–High school students have the opportunity to compete in this program that is designed to increase their knowledge about the environment. Students are challenged to use their critical thinking skills to demonstrate their understanding of aquatic resources, soils, forestry, wildlife, and current environmental issues.

- **Water Festivals**–In 2004, three water festivals occurred in the Lower Tallapoosa watershed. These were held in Lee and Montgomery counties and the City of Tallassee. Combined, these festivals educated more than 8,000 fourth grade students. For Lee and Montgomery counties, this is an educational field trip during which students participate in three "hands-on" activities related to water quality and the protection of our natural resources. In Tallassee, the event was conducted in the elementary schools.

- **City of Auburn–**The City of Auburn has developed the following plans to address rapid development without negatively affecting the environment:

  – *Greenspace/Greenway Master Plan*–The Auburn Greenspace Advisory Board was created by a City Council resolution in 2002. The purpose of the Board is to identify potential land area acquisitions by the City of Auburn for parks, recreation facilities, and greenways. Once identified, the City of Auburn could acquire and protect these properties from development. The Greenspace Advisory Board developed a Greenspace/Greenway Master Plan for the City of Auburn in 2003. In December 2003, this Plan was adopted by the City Council and currently is being used by the City of Auburn Planning Commission in conjunction with the approval of developments within the City. As of early 2004, the City of Auburn had acquired or protected approximately 250 acres of property located in environmentally sensitive areas as a result of the Greenspace/Greenway Master Plan. The proposed Greenspace/Greenway areas include bikeways and trails along existing and new roads and along waterways in the City of Auburn growth boundary. Areas along waterways may be improved or converted into natural trails and will be developed by the dedication of conservation easements in developments or the acquisition of property by the City of Auburn. The Greenspace Advisory Board recently revised

the initial Plan to include a vast expansion of the proposed greenspace/greenway areas. This first addition to the Greenspace/Greenway Master Plan was adopted by the City Council in October 2004.

  - *Land Use Plan*–Because of the rapid development and increase in population in the City of Auburn, City personnel and Auburn citizens recently developed a Land Use Plan for future development and growth within the City. The Land Use Plan that was developed, and recently adopted by the City Council, focuses on a City of Villages concept. This Plan focuses on the concept that natural resource conservation is critical to our quality of life as a part of community planning and development. The plan establishes that residential growth should focus on true neighborhoods that are part of larger "villages." Villages will contain vital elements to citizens such as grocery stores, retail stores, green spaces, etc. In addition, open green spaces will be linked and tied in the system of trails and greenspace areas created by the City's Greenspace/Greenway Master Plan. The Plan places a strong emphasis on maintaining and enhancing natural resources in the City of Auburn, such as for streams and greenspaces. By concentrating populations within these village centers, less automobile travel is required, effects on natural resources are lessened, and other adverse environmental effects are decreased. The Plan establishes the idea that development should be strategically placed away from the most critical resources.

- QCI Training–The QCIP provides training in the requirements of the Alabama NPDES rules; ADEM's construction storm water management program; evaluation of construction sites to ensure that QCP designed and certified BMPs detailed in a CBMPP are effectively implemented and maintained; and evaluation of conveyance structures, receiving waters, and adjacent affected offsite areas to ensure the protection of water quality and compliance with the requirements of the Rule. Through a partnership with CH2M HILL and the Home Builders Association of Alabama, thousands of builders, developers, public and private utilities, Alabama Department of Transportation (ALDOT), county officials, and municipal employees have participated in the credentialed workshops, where they learn about the ADEM construction storm water rules and erosion and sediment control BMPs. In the Lower Tallapoosa watershed, City of Auburn employees have undergone this training.

Stakeholder-suggested Activities

Although there are many effective educational programs in place that focus on water quality issues in the Lower Tallapoosa watershed, much more could be done to raise awareness and educate local citizens. Some potential educational strategies identified by the Lower Tallapoosa stakeholders are as follows:

- **Employ education about septic system maintenance**–Failing onsite septic systems cause human waste to leach into the soils surrounding the system. This waste, which has high levels of fecal coliform bacteria, can make its way into nearby water bodies and pollute them. Homeowners can be made aware of proper maintenance activities through workshops, reminder notices for pumping, and flyers on proper operation and maintenance. Installers and dischargers also can be educated about the hazards and encouraged to attend onsite wastewater training.

- **Encourage and promote recycling and reuse:**
  - Biosolids are nutrient-rich organic matters that are a by-product of the treatment of wastewater. When treated and processed, this material can be recycled and applied like a fertilizer to improve and maintain productive soils and to stimulate plant growth. Recycling biosolids saves local and state government significant amounts of money through lower management costs and the reduction of biosolids in landfills.
  - Treated municipal wastewater that is reclaimed (or recycled) is most commonly used in large-scale commercial applications such as golf courses, athletic fields, and landscapes. However, it also is being used for irrigation in residential areas. Water conservation is just one benefit to using reclaimed water. In addition, the quality and cost of this water is improving, making it ideal for irrigation applications.
  - Recycling turns materials that would otherwise become waste into valuable resources and generates a host of environmental, financial, and social benefits. Industries and municipalities should be encouraged to participate in WasteWise. WasteWise is a free, voluntary, EPA program through which organizations eliminate costly municipal solid waste and select industrial wastes, thus benefiting their bottom line and the environment.
- **Educate point sources about funding to correct potential water quality issues (WWTP Systems)**–Point-source pollution often comes from the millions of gallons of wastewater discharged from the pipes of industrial facilities and municipal sewage treatment plants into rivers, streams, lakes, and the ocean. The Water Quality Information Center (http://www.nal.usda.gov/wqic/) at the National Agricultural Library Agricultural Research Service, USDA, gives links to many federal financial tools that can be used to correct water quality hazards and issues.

Additional Education and Outreach Opportunities

Other potential educational strategies that may be considered are as follows:

- **Watershed boundary signs**–These signs may be located along roadways to inform motorists and pedestrians that they are entering a particular subwatershed, such as the Sougahatchee Creek subwatershed. This leads to awareness and ownership of their watershed.
- **Maximize existing relationships with Auburn University, Auburn University–Montgomery (AUM), Tuskegee University, and other educational institutions to encourage research studies in this watershed.** –Graduate students in ecological and environmental programs often perform fieldwork or conduct small monitoring projects as part of their research. Universities (or colleges) can serve as a resource for citizens to become aware of work being performed in their community through newspaper articles. Workshops focusing on the specific aspects of watershed health and function can also be carried out by universities to homeowners and school teachers to aid in water quality awareness. The results of such research projects offer valuable information about water quality and aquatic habitat.

- **Promote the use of storm drain stenciling**–Storm water runoff that is collected by storm drains can carry harmful pollutants to our streams, lakes and rivers. These pollutants can come from littering, automobile maintenance, household chemicals, and yard maintenance products. Stenciling the message "Dispose No Waste, Drains to Creek," helps to create public awareness and enhance the quality of a local subwatershed. A storm drain stenciling program can be used as an educational component for classrooms and community groups.
- **Develop, promote, and implement stream cleanup days**–Several cleanup days, such as the Sougahatchee Cleanup, are already in place or being coordinated. The Lower Tallapoosa CWP plan to initiate and coordinate a Renew Our Rivers Program on both Yates and Thurlow Lakes. Involvement and coordination will be solicited from schools, universities, and local businesses with advertisements placed on local radio stations and television stations. Additional cleanups can be planned as the need arises, because illegal dumping and littering are priority problems in this watershed.
- **Create organized planting projects for habitat restoration and enhancement**–Native plants can be planted along a stream or wetland by volunteers from the community. Involvement can be solicited from the Girl Scouts and Boy Scouts, the Boys and Girls Clubs, and other youth organizations. This activity will promote the importance of reducing streambank erosion in the community:
  - *Education Workshops*–Several educational workshops are offered through organizations such as the ACES. Some examples of workshops presented include NEMO, stream restoration courses, and the Watershed Academy.
- **Newspaper articles**–Monthly informative articles in local newspapers and newsletters about current water projects, water events, or water facts are needed in order to raise community awareness of the environment and inspire interest in conservation practices.
- **Posters and Bumper Stickers**–Educational posters and informative bumper stickers promoting stewardship of natural resources can be produced to increase public interest and be distributed free of charge to schools and the general public.

On-the-Ground Strategies

Increasing public awareness and implementing BMPs are both required to improve the water quality and biological integrity of a watershed. As discussed in Section 3, most counties in the State of Alabama do not have home-rule authority. None of the counties in the Tallapoosa River Basin have this regulatory authority. Therefore, subdivision regulations are the only way for BMPs to be established. For this reason, the only type of on-the-ground strategies that can be employed in the jurisdiction of city governments will be different from those in other areas. The implementation methods discussed below for rural areas will be more restricted than those in urban areas.

Urban BMPs

The Lower Tallapoosa CWP Stakeholder committee has identified management strategies that can be implemented in urban subwatersheds (Exhibit 6-11). Some examples include "environmentally sensitive development" initiatives, biosolids land application, and impact

fees for abandoned buildings. In addition to recommendations from stakeholders, municipalities are required to meet certain standards (CWA, SDWA, and storm water regulations). These regulations often involve the inspection and cleaning of sanitary sewers, maintenance of detention ponds, and proper solids handling.

Another strategy that should be considered is LID (low impact development), which is similar to "environmentally sensitive development." LID is one means of protecting and enhancing hydrologic systems. This approach is intended to mimic the functions of natural environments to reduce floods in developed areas, to reduce storm water storage requirements, to improve the water quality of runoff, and to help maintain and restore fish habitat. When implemented properly, LID allows for increased growth with minimal environmental effects. By educating developers about LID practices, the environmental benefits, and the potential financial benefits to them, LID practices may be encouraged within the Tallapoosa River Basin.

The primary parameters of concern most frequently identified by the Lower Tallapoosa CWP are OE/low DO, siltation, nutrient enrichment, and pathogen contamination. Habitat alteration, illegal dumping, and pH (high and low) also were mentioned repeatedly. Exhibit 6-15 is a matrix chart of recommended management strategies for cities in the Lower Tallapoosa watershed. The strategies are a mix of feedback from the Lower Tallapoosa CWP and other items that may not have been discussed. Some strategies address multiple water quality and biological concerns.

EXHIBIT 6-15
Urban BMPs
Tallapoosa River Basin Management Plan

Parameter of Concern	Riparian Buffers	Pervious Parking	Surface Sand Filter	Biosolids Reuse	Constructed Wetlands	Storm Drain Stenciling	Illicit Discharge Detection and Elimination
OE/DO	X		X				X
Siltation	X		X		X		
Nutrient enrichment	X		X	X			X
Pathogen contamination	X	X	X		X		X
Habitat Alteration	X				X		
Illegal Dumping						X	
pH					X		X

Note:
OE/DO = organic enrichment/dissolved oxygen

Rural BMPs

Because of the lack of home rule authority in the counties in the Tallapoosa River Basin, it is best to work with existing regulatory programs and other voluntary means to effect watershed improvements. In the Lower Tallapoosa, primary concerns in rural areas are related to agriculture, surface mining, and forestry. Listed below are management strategies, some of which were suggested by Lower Tallapoosa watershed stakeholders.

Agriculture

The most common water quality concerns generated by certain agricultural practices are caused by sediment, nutrient enrichment, pesticides, bacteria, and a variety of other chemicals used in the farming industry. Proper agricultural practices can be used to avoid creating water quality or biological concerns. The NRCS, SWCDs, and ACES have a variety of cost share (Section 7) and educational programs that landowners can use. Exhibit 6-16 lists some agricultural BMPs.

EXHIBIT 6-16
Agricultural BMPs
Tallapoosa River Basin Management Plan

Parameters of Concern	Conservation Tillage	Conservation Buffers	AFO Management	Erosion and Sediment Control
OE/DO	X		X	X
Siltation	X	X	X	X
Nutrient enrichment	X	X	X	X
Pathogen contamination			X	
Habitat Alteration				X

Note:
OE/DO = organic enrichment/dissolved oxygen
AFO = animal feeding operation

Surface Mining

Sand and gravel operations are abundant in some of the Lower Tallapoosa watersheds. The effective use of BMPs can prevent the degradation of water quality and habitat. Exhibit 6-17 lists some mining BMPs. Stakeholders can work with local mining companies to encourage the use of these BMPs.

EXHIBIT 6-17
Mining BMPs
Tallapoosa River Basin Management Plan

Parameter of Concern	Temporary and Permanent Seeding	Slope Management	Grass-lined Channels	Sediment Pond
OE/DO			X	X
Siltation	X	X	X	X
Nutrient enrichment			X	X
Habitat Alteration	X	X	X	X

Note:
OE/DO = organic enrichment/dissolved oxygen

Forestry

Properly managed forestlands protect water and provide wildlife habitat, aesthetic value, and recreational opportunities. Exhibit 6-18 lists some established forestry BMPs and the water quality and biological parameters that they address.

EXHIBIT 6-18
Forestry BMPs
Tallapoosa River Basin Management Plan

Parameters of Concern	Preharvest Planning	Streamside Mgmt. Zones	Forest Wetlands Protection	Road Construction and Maintenance	Revegetation	Fire Mgmt.	Forest Chemical Mgmt.
OE/DO		X					
Siltation	X	X	X	X	X	X	
Nutrient enrichment		X	X		X	X	
Pathogen contamination		X					
Habitat Alteration		X	X	X	X		
pH							X

Note:
OE/DO = organic enrichment/dissolved oxygen

7. Funding Opportunities

7. Funding Options

Introduction

To effectively protect the Tallapoosa River Basin watershed, funding and financing must be secured to support management activities. There are numerous ways to fund watershed programs and projects, and full program implementation will require multiple funding sources. The selection of funding and financing instruments will affect who bears responsibility for paying for the program, and how large their share for the program will be. The manner in which the program is funded also can affect how the program is operated and managed, as well as what will and will not be accomplished.

In some cases, especially those that relate to NPDES-regulated issues, including point sources and municipal, local governments and public utilities are obligated to take the lead. However, for a number of watershed issues, such as those related to addressing some NPSs and stewardship or educational efforts, volunteer organizations and other entities, such as the ACWP, can take a leadership role. Regardless of who leads what effort, those seeking funding should be aware of various funding alternatives and how to combine these alternatives to effectively fund management efforts. As the watershed management program for the Tallapoosa Basin develops, a more detailed evaluation to help ensure that all activities can be funded sufficiently will be needed.

The funding and financing options presented herein are in no way a complete list of the available options. Instead, some of the more commonly used methods, as well as a few innovative watershed management financing approaches being used in other geographical areas, are presented. For approaches that are being used in other areas, such as impact fees, statewide authorizing legislation may not currently be present in Alabama. Before pursuing these approaches, it is recommended that the passage of enabling legislation be investigated or that legal counsel be sought to advise on the current legality of these options.

Funding Options

Federal and State Grant Programs

A number of federal and state grant programs are available to state, local, and tribal governments; nonprofit organizations; and public educational institutions. Grant programs can provide funding for various types of projects. These sources are often used as "seed funding" to start programs or for program planning. Other common uses of grant funding are for demonstration projects, economic development, or projects that benefit disadvantaged neighborhoods. Various federal agencies have grants for monitoring environmental conditions, enhancing habitat, encouraging community programs, developing and implementing educational efforts, and other specific programs. There are numerous grant sources, and funding availability and program requirements may periodically change.

Federal Funding Administered at the State and Local Levels

Several federal agencies, often in association with coordinating state agencies, provide grant funding to local governments to help the federal agency achieve its objectives. Some potential grant funding sources for watershed management related activities include EPA, U.S. Department of Transportation (DOT), USDA, and U.S. Department of Housing and Urban Development (HUD). The following describes a few of the major federal programs available. This list is not exhaustive, and there are numerous other federal programs through which dollars can be accessed.

Section 319 (Nonpoint–Source Implementation Grants)

Section 319 grants are provided to the states in accordance with Section 319 of the CWA and are a primary source of revenue for efforts to target NPS pollution in Alabama. The program is administered by ADEM, with federal oversight provided by EPA Region 4. Grant funds target NPS education and outreach, technical assistance, BMP demonstration projects, water quality monitoring, and watershed protection, and support ACWP activities. Section 319 funds are awarded using a competitive project proposal process. Grant funding and application information is announced using Requests for Proposals (RFPs) published in major newspapers and newsletters, and at various meetings and conferences. Information also may be found on the ADEM website at www.adem.state.al.us. Section 319 federal grant funds may provide 60 percent of the total cost of an approved project. At least 40 percent of the project must be matched with real or in-kind non-federal funding. Project funding priorities include the development and implementation of watershed protection plans for NPS-impaired waters. Phase I and Phase II permitted areas and confined animal feeding operations generally are not eligible for Section 319 funding.

Hazard Mitigation Grant Program

This program is administered at the federal level by the Federal Emergency Management Agency (FEMA) and at the state level by the Alabama Emergency Management Agency (AEMA). Financial assistance is provided through the program to state and local governments for projects that reduce or eliminate the long-term risk to human life and property from the effects of natural hazards. The grant program has 75 percent federal and 25 percent local contribution. The non-federal share may be met with local cash contributions, in-kind services, or certain other grants such as Community Development Block Grants. Although AMEA administers the program in Alabama, FEMA makes the final decisions on project eligibility. Eligible projects include acquisition of property, retrofitting of buildings, development of standards with implementation as an essential component, and structural hazard control or protection measures such as dams and sea walls.

Tea3 Funds–Intermodel Surface Transportation Efficiency Act (ISTEA) and Transportation Equity Act (TEA)

Tea3 is the third iteration of federal programs based on ISTEA and TEA legislation. The program, which was formerly known as TEA-21, can be used by local governments for any roads not functionally classified as local or rural minor collectors. Each state sets aside funds for transportation enhancements, which can include but are not limited to such activities as wetland mitigation and implementation of control technologies to prevent polluted highway runoff from reaching surface water bodies. Tea3 funds also can be used to fund roadside landscaping projects associated with highway beautification. Such projects can be

used to restore roadside vegetation along drainage ditches to improve the filtration of and to reduce roadside erosion. This program also funds other enhancements not linked to watershed-related projects. Local governments, profit and nonprofit entities, and colleges and universities may be eligible for this funding, which is usually 80 percent federal funding and 20 percent local match.

Environmental Quality Incentive Program (EQIP)

The EQIP is a federal cost-share program, which was authorized in the 1996 Farm Bill. Through the EQIP program, property owners can receive assistance to help them to comply with federal, state, and other environmental laws. The EQIP program targets and primarily is used by agricultural producers. Assistance provided through this program may be in the form of technical, cost-sharing, financial incentives, and producer education related to a broad range of soil, water, air, wildlife, and related natural resource concerns on Alabama's farms and ranches.

EQIP assistance programs are available to crop, forage, and forest products producers as well as to wetlands and wildlife land owners who choose to enter into 5- and 10-year contracts based on conservation plans for their operations. These conservation plans may include a combination of structural, vegetative, and land management components. The program prioritization is led, coordinated, and implemented on the local level by NRCS (http://www.al.nrcs.usda.gov/) District Conservationists and Soil and Water Conservation District Boards (http://swcc.state.al.us/). Generally, funding decisions are made using rankings based on locally developed priorities. Contract limits and cost-share may vary. In 2004, to receive the funds, property owners must provide a 40 percent cost-share.

Section 206–Aquatic Ecosystem Restoration

Through the Section 206 Program, the COE provides funding to local governments to support projects to improve, protect, and restore aquatic ecosystems. An example of a typical Section 206 project is streambank restoration. Funds can be used for planning and construction, and Section 206 requires a 35 percent non-federal match. This match may be provided through donated lands, easement or right-of-ways, or through certain in-kind services. The local government that sponsors the Section 206 program must agree to take responsibility for long-term maintenance of the project. Additional information can be obtained from the COE, Mobile District website located at: http://www.sam.usace.army.mil.

Community Development Block Grant Program (CDBG)

The CDBG program is funded and administered at the federal level by the HUD. According to HUD, the objective of the CDBG program is to develop viable communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low- and moderate-income. In Alabama, the program is administered by ADECA. Each year, ADECA is responsible for setting priorities and criteria for selecting projects. Grants are awarded to local governments in non-entitlement areas on a competitive basis. Projects must be for development activities and benefit low- to moderate-income individuals.

Depending on state priorities, CDBG funds can be used for a variety of purposes related to watershed or water resource management. Eligible activities include construction or

reconstruction of water and sewer facilities, management infrastructure development or improvement, or public works development. In some cases, CDBG funds also may be used for the acquisition of property for public purposes or to support feasibility studies related to development. Communities benefiting from the CDBG program are required to provide local matching funds. Additional information can be obtained by contacting the ADECA Office of Community Services at (334) 242-5100.

Direct Federal Funding

For projects with national significance, Congress can appropriate federal funds for certain uses. Reliance on direct federal funding can be risky, however, because the funding must be re-appropriated each year.

Direct State Funding

Like direct federal funding, projects with state significance or strong local support may be considered for a direct appropriation from the Alabama General Fund. This type of appropriation must be approved by the Alabama Legislature and the Governor. At present, because of state budget cuts, obtaining direct state funding may not be a feasible alternative.

Grant Programs Commonly Used for Watershed Programs

National Fish and Wildlife Foundation (NFWF)

NFWF is a nonprofit organization established by Congress in 1984. The NFWF awards challenge grants for natural resource conservation projects. Additional information and application guidelines are available at: http://www.nfwf.org.

Southern Rivers Conservation Initiative

The Southern Rivers conservation Initiative is administered by the NFWF to provide funding to restore and enhance habitat in southern states, including Alabama. Funding can be used for stream restoration, freshwater mussel conservation, and to manage imperiled fishes. Projects must demonstrate a community-based approach, benefit water quality, and involve specific on-the-ground activities. Additional information is available at: http://www.nfwf.org/programs/grant_apply.htm.

Flood Hazard Mitigation and Riverine Ecosystem Restoration Program

This watershed-based program, which is also known as Challenge 21, focuses on identifying sustainable solutions to flooding problems by examining nonstructural solutions in flood-prone areas, while retaining traditional measures where appropriate. The program is administered by the U.S. Army Corps of Engineers, and additional information is available at: http://www.hq.usace.army.mil/cepa/pubs/cf-challenge21.htm.

Environmental Education Grants

These grants are available to support environmental education projects that enhance the public's awareness, knowledge, and skills to make informed decisions that affect environmental quality. The program is administered by EPA; additional information is available at http://www.epa.gov/enviroed/grants.html (see Appendix I).

Watershed Protection and Flood Prevention Program

This program provides technical and financial assistance to address resource and related economic problems on a watershed basis. The program is also known as the "Small Watershed Program," and it is administered by the NRCS. More information can be obtained by contacting the local NRCS district office.

Water Quality Cooperative Agreements

These grants, administered by EPA, are provided to support the creation of unique and new approaches to meeting sanitary sewer, and combined sewer outflows, biosolids, and pretreatment requirements, as well as enhancing state capabilities. Additional information is available at: http://www.epa.gov/owm/cwfinance/waterquality.htm.

Watershed Assistance Grants

This EPA funding supports organizational development and capacity building for watershed partnerships with diverse membership. Additional information is available at: http://cfpub.epa.gov/fedfund/program.cfm?prog_num=63.

Five-Star Restoration Program

As part of the Clean Water Action Plan, the Five-Star program seeks to support restoration projects in 500 watersheds by 2005. Competitive projects will have a strong on-the-ground habitat restoration component that provides long-term ecological, educational, and/or socioeconomic benefits to the people and their community. Additional program information is available at: http://www.epa.gov/owow/wetlands/restore/5star.

U.S. Fish and Wildlife Service Cooperative Endangered Species Conservation Fund

Through this program, FWS provides financial assistance to states and territories that have entered into cooperative agreements with the FWS to assist in the development of programs for the conservation of endangered and threatened species. There are four program areas. These are Conservation Grants, Habitat Conservation Planning Assistance Grants, Habitat Conservation Plan Land Acquisition Grants, and Recovery Land Acquisition Grants. Nonprofits, local governments, and other third-party organizations are not directly eligible. However, they can work with organizations and local governments may work with the Alabama Fish and Wildlife Service to pursue funds. Additional program information is available at: http://endangered.fws.gov/grants/section6/index.html.

Urban and Community Forestry Challenge Cost-share Grant Program

This program is administered by the U.S. Forest Service and grant awards are based on recommendations by The National Urban and Community Forestry Advisory Council. Additional information is available at: http://www.treelink.org/nucfac/ccs_info.htm.

Legacy, Inc., Partners in Environmental Education

Legacy, Inc., is a statewide organization that provides grants to support programs that aim to help educate people to become environmentally responsible citizens. The organization supports fact-based programs that consider alternative views. Both a competitive grant program that may provide up to $10,000 and a mini-grant program that may provide up to $2,500 are available. Legacy, Inc., grants do not require the provision of local matching

funds. Application guidelines and deadlines are available on the Website located at: http://www.legacyenved.org.

Alabama Forest Forever

Through the Alabama Forest Forever campaign, funding is available to help educate Alabama citizens about the significance of forests to environmental quality and Alabama's economy. Grants, which can be up to $10,000, are distributed on an annual basis. Educational programs focus on clean water, wildlife, and other issues related to rural and urban forests. The program is a joint effort between the Alabama Forestry Association and the Alabama Forestry Commission.

For more information and grant guidelines, please visit the program's website at: http://www.alaforestsforever.org.

Private Foundation Grants and Awards

In addition to these resources, private foundations are potential sources of funding to support watershed management activities. Periodically, some private foundations change eligibility requirements and funding priorities. Therefore, current grant guidelines should be sought before the submittal of any application. Many private foundations post grant guidelines on websites. Two online resources for researching sources of potential funding are:

1. The Foundation Center at: www.fdncenter.org/funders/web_search/web_search.html, and
2. The Foundations and Grantmakers Directory at www. foundations.org/ grantmakers.html.

Contributions

Membership Drives

Membership drives can provide a stable source of income to support watershed management programs. Through a membership drive, organizations require a fee in the form of periodic dues from individuals and organizations that would like to participate in organizational activities. In return, members are provided with the opportunity to attend meetings and events. As well, they often receive literature or web page access to allow them to maintain current knowledge about organizational activities. Organizations may opt to offer varying levels of membership with those who pay higher membership dues receiving more benefits or opportunities.

Special Events

Special events are an effective way to raise funds. There are numerous types of events that can be held, and there are varying levels of each event. Special events vary in the level of investment, planning, and coordination that is needed to ensure success. When planning an event, the upfront costs compared with the total expected revenue should be considered. Some events, such as those that involve selling donated items, take minimal upfront investment and can produce sizable returns. Examples are garage sales, bake sales, and auctions. A number of merchandising companies offer fundraising programs for nonprofit

organizations. However, returns on these types of sales may be lower than expected due to the costs of purchasing the items that are sold. Events that take more investment are specialty conferences or seminars. Large gala events such as dinners, dances, golf tournaments, and concerts generally take the most investment and require more manpower. However, with adequate marketing and the appropriate clientele, gala events may offer sizable returns. Those providing the larger returns usually offer several options for the organization to raise funds. An example is a dinner or dance during which there is a live or silent auction of donated items:

Donations

Donations can be a major source of revenue for supporting watershed activities. The following is a list of sources of donations:

- *Individuals* can be a large and ongoing source of support. Individuals who participate or volunteer in organizational activities or who are advocates for water quality are most likely to give a contribution to support watershed activities. One disadvantage to seeking funding from individuals is that developing giving programs can be costly when compared to the return received from each individual reached through the giving program. Unless given through a multi-year campaign, donations from individuals may only be a one-time gift. Donations from individuals may be solicited periodically, on an as-needed basis, or during an annual campaign.

- *Family Foundations* can provide large gifts for causes that align with their missions and objectives. For watershed activities, foundations that support environmental causes and education may be approached. The larger family foundations typically have clear funding guidelines that must be followed, while smaller foundations may have broad criteria that provide little guidance. A number of family foundations do not accept unsolicited requests, and some of these foundations can be difficult to access. However, volunteers and board members can be useful in approaching family members or foundation personnel when seeking funding. Funding from these types of foundations often is used as "seed money" to start programs.

- *Community Foundations* are comprised of a number of foundations or funds that are managed by one central entity and that serve a limited geographical area. Community foundations are established in most of Alabama's urban areas. However, there currently is only one community foundation in the Tallapoosa River Basin, the Central Alabama Community Foundation. Various grant programs are available through community foundations. Often funding from this type of foundation is earmarked for specific purposes. Grant application deadlines, funding criteria, and guidelines can be obtained by contacting the community foundation that serves that area where a watershed activity or program is planned.

- *Corporations* can provide large amounts of funding, and contributions sometimes are provided on an ongoing or multi-year basis. Corporations are easier to access than many foundations, and they may encourage workers to volunteer with watershed programs. In addition, a number of corporations' contributions may be tied to volunteer involvement. Some have formal procedures for applying for funding, while others have informal procedures. It is not unusual for corporations to limit funding to the area where

they are based or to areas where they have operations. Board members and volunteers who are acquainted with corporate decision-makers often can be beneficial in seeking funding from corporations.

- *Federated Funds,* such as United Way agencies, can provide income to support some program activities. Some federated funds provide special grant programs to fund programs that are not within annual appropriations. Because these funds typically focus on social services, seeking federated funds may only be appropriate for educational or other programs that teach social responsibility for protecting watersheds.
- *Churches and Civic Groups* can provide significant funding resources and volunteers to support watershed activities. Most often, these types of organizations seek group projects. They often have a service need focus and programs seeking funding from these types of organizations should make sure that program objectives align with the organization's service needs. Some civic organizations hold annual fundraising events, with the proceeds going to support one or more cause. Funding can range from the low hundreds to $50,000 or more.

User Fees, Taxes, and Assessments

User fees and charges are collected for the provision of services that provide a specific benefit to a user. Typically, users will have a choice of whether they use the service, and may only have to pay the rates or charges if they choose to use the service. User fees and charges may be collected by county and municipal governments; water, sewer, and authorities; private entities; nonprofit organizations; and other forms of government. There are many types of user fees and charges.

Taxes are used to fund activities that do not provide a specific benefit, but provide a more general benefit to the community; the user may not be able to avoid paying the tax. Assessments must show a benefit to the property owned by the user. There are various forms of taxes and assessments. It is important to note that, while taxes can create a solid funding base that can be used to fund annual capital and operating costs, there is often political pressure to keep taxes low and intensify competition for these resources.

One of the concerns that typically arises in developing a plan for funding a new program, especially those that involve fees and taxes, is the impacts of any new costs on those of limited means. Potential options for mitigating these impacts on low-income and fixed-income users thus are often an important element of the resulting funding plan. There are various approaches to support reducing the cost of providing services associated with the basin management plan to users of limited means.

Rates and Charges

Alabama law authorizes some public utilities to collect rates and charges for the services they provide. Because watershed management programs provide benefits to water and wastewater systems by protecting water supply sources and providing receiving water for wastewater effluent, water and wastewater utility systems often provide funding for watershed management programs. In some states, some water and wastewater utilities have specific charges in their rates for watershed management services.

One option is for local governments to organize the provision of watershed and management services within a specific department. Many of these departments are established as enterprise funds in which the system is expected to be operated like a business (utility) that generates sufficient funding for its activities. Funding is generated through the rates and charges it collects from the users of the system. Charges typically are based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of runoff compared to natural conditions; such surfaces cause runoff that directly or indirectly discharges into public storm drainage facilities and creates a need for management services. Thus, users with more impervious surface are charged more for service than users with less impervious surface. Utility fee structures vary and need to be determined at the local level. Currently, with the exception of Jefferson County, there is no state enabling legislation for the establishment of utilities in Alabama. Communities considering this option would need to pursue the passage of local or statewide enabling legislation before a utility can be established.

Miscellaneous Fees and Incentives

Most utilities and local governments collect miscellaneous fees for services that the utility or local government may provide. These fees typically are designed to recover the utility's or local government's costs incurred to provide these specific services (plan review and inspection fees), or to recover the costs they incur because of the customers' actions (issuing reminder bills, lost interest income, etc.). Utilities and governments also may provide incentives and credits. These could be in the form of a credit to encourage and reward property owners for undertaking measures that reduce impacts from runoff.

Fees and incentives are used in Alabama. For example, the Water Works and Sewer Board of the City of Gadsden, which is in the Coosa River Basin, charges a sewer surcharge fee for restaurants that do not have a grease trap. For those, that do have a grease trap, it must be pumped monthly or have a system installed that drips a bacteria feed to prevent grease build up. Therefore, to avoid the additional fee, the restaurant operators have an incentive to use BMPs for grease management.

Impact Fees

Impact fees, which also are known as capital contribution or facilities fees or system development charges, among other names, typically are collected from developers or property owners at the time of building permit issuance to pay for capital improvements that provide capacity to serve new growth. The intent of these fees is to avoid burdening existing customers with the costs of providing capacity to serve new growth ("growth pays its own way"). impact fees are designed to reflect the contribution of the new development and the costs incurred to provide sufficient additional capacity in the system to meet those needs. These charges are set in a fee schedule applied uniformly to all new development. Utilities strive to ensure that impact fees, such as monthly user fees, reflect customers' demands on the system (which, again, is typically measured by the property's impervious surface area). Communities that institute impact fees must develop a sound financial model that enables policy makers to justify fee levels for different user groups, and to ensure that revenues generated meet (but do not exceed) the needs of development. Currently, there

does not seem to be any enabling legislation in Alabama that authorizes impact fees to be assessed.

In Lieu of Fees

An alternative to requiring developers to construct facilities to manage runoff from their development is for communities to provide developers a choice of paying a front end charge for offsite capital improvements required to serve the new development, as opposed to requiring the developer to construct the improvements. Payment would be a condition of development approval, and would recover the cost of the offsite improvements to manage the development's runoff or its proportionate share of the cost of a regional facility serving a larger area.

Special Assessments

The construction of drainage facilities to serve an existing development may be accomplished through the creation of a special assessment area. Special assessments are created for the specific purpose of financing capital improvements, such as provisions, to serve a specific area. Once the special assessment has been created, special assessment bonds can be issued, which are secured by liens on the properties benefited by the improvements. Debt service on the bonds issued to finance the improvements is recovered through annual assessments on these same properties. For improvements, a property owner's share of the cost of the improvements frequently is based on the property's total area, or feet of street frontage. These annual assessments are generally collected along with the user's annual property tax bill.

Sales Tax/Local Option Sales Tax

Like many other states, Alabama has authorized a sales tax at the state and local (city and county) levels. Local governments can use tax revenues to provide funding for a variety of projects and activities. Currently, the Alabama state general sales tax is 4 percent. There are some exceptions, such as different rates for farm equipment and automobiles. Local governments, both cities and counties, have the authority to add additional taxes. Therefore, tax rates vary from locality to locality. The general sales tax in the incorporated areas within the Tallapoosa River Basin watershed ranges from 7 percent to 10 percent.

Property Tax

Property taxes are assessments charged to real property owners based on a percentage (millage rate) of the assessed property value. These taxes generally support a significant portion of a county's or municipality's non- public enterprise activities. However, the revenues from property taxes also can be used for public enterprise projects, and to pay debt service on general obligation bonds issued to finance system improvements. Because communities are limited in the total level of the millage rate, use of property taxes to fund improvements could limit the County's or a municipality's ability to raise funds for other activities.

Excise Taxes

Excise taxes are taxes on specific goods and services. These taxes require special legislation, and the funds generated through the tax are limited to specific uses. Examples include the

lodging, food, and beverage tax, which generates funds for the promotion of tourism; and the gas tax, which generates revenues for transportation–related activities.

Bonds and Loans

Bonds and loans can be used to finance capital improvements. These programs are appropriate for local governments and utilities that need to make improvements to improve and protect water resources. The cost of the improvements is borrowed through the issuance of bonds or a loan. Associated with the issuance of a bond or loan must be a source of funding for the payment of the resulting debt service on the loan or bonds. Lease-purchase financing also can be used to finance capital improvements. It offers the advantage of not requiring the local community to issue debt to finance the improvement.

Revenue Bonds

Revenue bonds are bonds that are secured by a pledge of the revenues of the public enterprise or local government. The entity issuing bonds pledges to generate sufficient revenue annually to cover the system's operating costs, plus meet the annual debt service requirements (principal and interest payment) times a factor, termed the coverage factor, which is designed to provide additional protection to the bond holders.

General Obligation Bonds

Cities, counties, and some utilities or service districts generally are able to issue general obligation bonds that are secured by the full faith and credit of the entity. In this case, the entity issuing the bonds pledges to raise its property taxes or use any other sources of revenue, such as rates and charges, to generate sufficient revenues to make the debt service payments on the bonds. A general obligation pledge is a stronger pledge than a revenue pledge, and thus may carry a lower interest rate than a revenue bond.

Special Assessment Bonds

Special assessment bonds are secured by a lien on the property that is benefited by the improvements funded with the special assessment bond proceeds. Debt service payments on these bonds are funded through annual assessments to the property owners in the assessment area. (See the "*Special Assessments*" section under "*Taxes and Assessments*.")

State Revolving Fund (SRF) Loans

Initially funded with federal and state money and continued by funds generated by repayment of earlier loans, State Revolving Funds (SRFs) provide low-interest loans for local governments and utilities to finance public infrastructure for water pollution control and water supply, which could include watershed management activities. These loans typically require a revenue pledge, like a revenue bond, but carry a below market interest rate and limited term for debt repayment. Loan applicants must demonstrate an ability to repay the loan. In Alabama, the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) are administered by the Facilities Construction Section of ADEM. In general, projects that primarily are intended to serve future growth are not

eligible, and the minimum loan amount is $100,000. Typical programs funded with SRF loans are as follows:

- Publicly owned water or wastewater treatment works
- Sewer rehabilitation
- Interceptors, collectors, and pumping stations
- Drinking water storage facilities
- New/rehabilitated water source wells
- Water transmission/distribution mains

There are other SRF programs in Alabama that may help fund projects to ensure that adequate infrastructure to protect water resources is provided in order to support economic growth for industries and businesses. Loan availability and funding priorities vary. General information about these types of SRF loans can be obtained from the Alabama Association of Regional Councils. Depending on the location of the potential project, specific information about these programs for counties in the Tallapoosa River Basin watershed can be obtained at the Central Alabama Regional Planning and Development Commission, EARPDC, Lee-Russell Council of Governments, or South Central Regional Planning and Development Commission.

Investment Income

Most nonprofit organizations have limited resources and must spend funding as it is raised for organizational administration and program support. However, some organizations have elected to establish their own foundations or endowment funds to provide long-term funding stability. Endowment funds can be established and managed by a single organization-specific foundation or an organization may elect to have a community foundation hold and administer its endowment. With an endowment fund, the principal or actual cash raised is invested. The organization may elect to tap into the principal under certain established circumstances. In most cases, principal funds are left intact and interest earned by investing the principal may be available on a periodic basis to support organizational operations and activities. Endowment funds are raised through special campaigns and special events. While there are some exceptions, most foundations and corporations do not provide endowment funds.

Emerging Opportunities for Program Support

The following describes two relatively new tools for funding watershed management activities.

Water Quality Trading

EPA released a final Water Quality Trading policy in January 2003 and is encouraging the development of trading programs. Trading allows regulated entities to purchase credits for pollutant reductions in the watershed or a specified part of the watershed to meet or exceed regulatory or voluntary goals. There are a number of variations for water quality credit trading frameworks. Credits can be traded, or bought and sold, between point sources only, between NPSs only, or between point sources and NPSs.

The trading framework that allows the most latitude includes both point and non-point sources as active participants. In this general framework, all participants could pursue trading options from both point and non-point sources. For point-point and point-nonpoint frameworks, ADEM and EPA would have to approve the programs because they are responsible for the issuance of NPDES and other permits, as well as for ensuring permit compliance.

Mitigation Banking

Mitigation banking presents another opportunity for furthering the objectives of watershed protection and improvement programs. There is a current push at the federal level to preserve and protect wetlands. Because of this push and the implementation of established programs, developers often are required to mitigate the impacts of their development on wetlands, streams, or animal habitat. For every acre of wetlands, streambed, or habitat that their development destroys, the developer typically is required to create other wetlands, habitat, etc., to mitigate the impact of the development. Developers could mitigate these impacts on the site of their development or elsewhere. The ideal is to implement mitigation projects in the same watershed as the development impact. However, this is not always possible. If mitigation banks are made available, developers may satisfy requirements by purchasing credits from the mitigation banks. Mitigation banks are created by property owners who restore and/or preserve their land in its natural condition; such banks have been developed by public, nonprofit, and private entities. In exchange for preserving the land, the "bankers" get permission from ADEM, COE, or other appropriate state and federal agencies to sell mitigation banking credits to developers wanting to mitigate the impacts of proposed development. By purchasing the mitigation bank credits, the developer avoids having to mitigate the impacts of their development on site. Public and nonprofit mitigation banks may use the funds generated from the sale of the credits to fund the purchase of additional land for preservation and/or for the restoration of the lands to a natural state.

Options Often Overlooked or Unnoticed

Public and Private Partnerships

There are many forms of public and private partnerships. The ACWP is a private organization. However, many of the partners who participate in the ACWP represent public entities. Having both public and private stakeholders at the table when pursuing funding for the implementation of management strategies is vital. Public entities have advantages associated with public financing, and the involvement of these entities can bring key decision-makers to the table. Private entities sometimes can contribute significant financial support, needed expertise, and voluntary labor. When needed and if appropriate, all of the resources provided by private interest may be used to meet matching requirements.

Redirection of Existing Programs and Funding

For priority projects, one way to fund programs is to change the priorities or focus of existing activities to help achieve the objectives of the watershed management plan. This could entail reducing funding for other activities and making such resources available to fund the watershed management program. Many, if not most, existing local governmental activities and/or sources of funding could be candidates for such an approach, although this probably would be at a cost to those activities losing funding. Because this approach

reduces support of one program to fund another, it is often unpopular among stakeholders. However, for any identified projects that have broad popular support and that need to be implemented in a short time frame, the redirection of existing resources is an option that could be pursued.

Doing More with Less

By using this option, costs of implementing watershed management strategies are reduced by instilling competition, providing incentives to reduce program costs, or reducing demands for the continued need of structural strategies through effective education. Doing more with less is more likely to succeed when a public-private partnership is involved in making decisions and providing resources.

Reducing Funding Demands

Cost savings could be achieved by reducing user demands on the system or by sharing facilities. For example, the high costs of constructing facilities to serve a specific development potentially could become more affordable if the facilities to serve this development could be combined with other facilities to be constructed to serve other developments. The costs of the facilities to serve the combined developments could then be shared. Regulations requiring increased levels of onsite retention of flows or onsite treatment of runoff can reduce the demands on downstream public facilities.

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APPENDIX A

Water Quality and Biological Data

Below is a list of programs and projects in the Tallapoosa Basin that involve the gathering of physical, chemical, bacteriological, and biological data.

Alabama Department of Environmental Management

The Alabama Department of Environmental Management (ADEM) has a number of surface water quality and biological monitoring programs. Data gathered between 1997 and 2003 were used in all three Clean Water Partnership (CWP) Dataviewers, as well as the assessment process. Below are brief descriptions of the programs performed in the Tallapoosa River Basin.

Alabama's 2004 Integrated Water Quality Monitoring and Assessment Report

The 2004 Alabama 305(b) report is significantly different from those in years past. This report combines surface and groundwater management programs with a comprehensive list of Alabama's waters. This is consistent with the U.S. Environmental Protection Agency's (EPA's) 2003 guidance.

Alabama's 2002 Water Quality Report to Congress (Clean Water Act §305(b) Report)

Every 2 years, ADEM sends a water quality report to congress as part of the "National Water Quality Inventory Report to Congress (305(b) Report)." The purpose of this report is to characterize Alabama's water quality, to identify impairments, and to describe the programs that are used to restore and protect our water resources.

§303(d) Waterbody Monitoring Project

ADEM monitors waterbodies suspected of having water quality impairments for the purpose of 303(d) listing and de-listing. Chemical, habitat, and biological data are collected.

Alabama Monitoring and Assessment Program (ALAMAP)

To evaluate the status of streams across the State of Alabama, ADEM randomly monitors 250 stations for chemical, physical, and habitat parameters over a 5-year period. Select historical ambient monitoring stations are monitored in June, August, and October to provide data adequate for trend analysis. Fifty stations are selected each. The data collected at these stations will statistically represent all streams. This type of assessment is used to address overall state water quality.

Clean Water Strategy Project

In 1996, ADEM sampled locations with known water quality problems and areas where there were insufficient data. Monthly water quality samples were taken from June through October.

Intensive Water Quality Survey of Coosa and Tallapoosa River Reservoirs, 1997

(http://www.adem.state.al.us/FieldOps/WQReports/WQCoosa&Tall97.pdf)

Because of the proposed water diversion activities in the Coosa and Tallapoosa River Basins, intensive monitoring of these reservoirs was used to gather pre-diversion water quality data. In 1997, stations were monitored on a monthly basis (April through October) at the deepest point in the dam forebay. Several physical, chemical, and biological measurements were taken including, but not limited to, temperature, ammonia, and chlorophyll *a*. Eleven stations were monitored in the Tallapoosa River Basin (Harris, Martin, Yates, and Thurlow Reservoirs).

Reservoir Water Quality Monitoring Program (RWQMP)

ADEM's RWQMP monitors the water quality and trophic status index (TSI) of the large publicly owned lakes and reservoirs in Alabama. Monitoring occurs during the growing season (April through October) every 2 years, although many lakes and reservoirs are monitored every year. More intense monitoring is done if funding is available. The RWQMP focuses on the vertical profiles of certain physical and chemical parameters. The development of an adequate water quality database for all publicly owned lakes, the establishment of trends in lake trophic status, and the satisfaction of Section 314 (a)(1) of the Water Quality Act of 1987 are the primary goals of the program.

Screening Assessment of the Tallapoosa River Basin–2000

(http://www.adem.state.al.us/FieldOps/WQReports/SurfaceWQScreenAssessTallRiv00.pdf)

The aquatic assessment unit of the Field Operations Division completes a nonpoint source screening assessment of each river basin in the state every 5 years. In 2000, an assessment of the Tallapoosa River Basin was performed.

State Parks Monitoring Project

In 1998, ADEM sampled streams flowing through watersheds located in Alabama state parks. The purpose of this program is to identify impairments and streams they may be considered for upgrades to Outstanding Alabama Water. The assessments include chemical, physical, habitat, and biological monitoring.

Water Quality Assessment, Unnamed Tributary to Crooked Creek (Lineville Lagoon), Lineville, Alabama, Clay County, June 1999

Aquatic macroinvertebrate, habitat assessments, toxicity testing, and physical/chemical analyses were performed to evaluate the influence of a permitted lagoon in discharging to an unnamed tributary to Crooked Creek. The water quality was determined to be slightly impaired and the macroinvertebrate assessment revealed a good score.

Alabama Department of Public Health

Fish Consumption Advisories, 2003

(http://www.adph.org/risk/AlabamaFishConsumptionsAdvisories03.pdf)

Finally, ADEM conducts annual fish tissue sample surveys in lakes and rivers across the state. The sample fish tissues collected through this survey are analyzed for the presence of toxic substances. The results from this analysis are used as the basis for fish consumption advisories issued by the Alabama Department of Public Health (ADPH). In Fiscal Year 2001, ADEM conducted a survey at two locations on Lake Wedowee, four on Lake Martin, and one on Yates Reservoir. No fish consumption advisories were issued for any of the reservoirs on the Tallapoosa River based on those surveys.

Alabama Water Watch

Alabama Water Watch (AWW) is a citizen-monitoring program that is managed through Auburn University's Department of Fisheries and Allied Aquacultures and the International Center for Aquaculture and Aquatic Environments. The AWW staff perform training sessions; compile and maintain data about the citizen volunteers, monitoring sites, and water quality data; interpret technical data gathered by monitors; create a variety of media; and supply online summary graphs and maps.

From the inception of the AWW Program in 1992, more than 200 citizen groups have become involved with water monitoring on hundreds of waterbodies. According to the AWW website, citizens have sampled 1,400 sites on 500 waterbodies and submitted more than 25,000 chemistry and 4,000 bacteriological data forms.

AWW's citizen monitoring program offers two field-testing capabilities with EPA-approved protocols–manuals, testing kits, and training for water chemistry and bacteria. Chemistry monitoring is done with the Lamotte test kit, which tests for six water parameters: temperature, pH, dissolved oxygen (DO), hardness, alkalinity, and turbidity. Additionally, water clarity is measured using a Secchi Disk, and air temperature also is measured as part of the sampling protocol. Bacteriological sampling is done using Coliscan Easygel sampling techniques. Citizen data are compiled and stored as part of the AWW online database at Auburn University.

Listed below are the AWW groups in the Tallapoosa River Basin and the respective links to data, where available. Note that only AWW groups that contributed data between 1997 and 2003 are included. These data were included in all three CWP Dataviewers and were used in the assessment process.

Auburn Outing Club

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/aoc/07017000.htm)

Chewacla Water Watch

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/chew/07012000.htm)

Environmental Awareness Organization

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/eao/07007000.htm)

Friends of Chewacla-Uphapee Watershed

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/chewup/07016000.htm)

Friends of Hodnett Creek

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/hodnett/07015000.htm)

Lake Watch of Lake Martin

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/lwlm/07001000.htm)

Lake Wedowee Property Owners Association

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/lwpoa/07004000.htm)

League of Women Voters

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/lwv/07002000.htm)

Save Our Saugahatchee

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/sos/07011000.htm)

Southern Union Community College

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/succ/07013000.htm)

Tri-River Region Water Watch

(http://www.alabamawaterwatch.org/watershedsites/tallapoosa/mww/07009000.htm)

Wrights Mill Road Elementary School

Geological Survey of Alabama

The Geological Survey of Alabama (GSA) monitors water well usage, groundwater levels, and water quality. Groundwater data from 2000 were obtained for the Middle and Lower Tallapoosa watersheds. The data include basic water quality parameters (such as dissolved oxygen, pH, and temperature), metals (i.e., aluminum, cadmium, and chromium), other ions (for example, bromine, fluoride, and chloride), and nutrients (i.e., phosphate, nitrate, and nitrite), as well as pesticides (such as Alachlor, Aldicarb, and Atrazine).

Soil and Water Conservation Districts

The Alabama Soil and Water Conservation Districts (SWCDs) performed assessments of the subwatersheds in every county of Alabama in 1998. Data gathered include estimated land use percentages, sediment loads, animal information, and domestic wastewater. This

information was included in all three CWP Dataviewers and used in the assessment process for each watershed in the Tallapoosa.

U.S. Geological Survey

(**http://www.usgs.gov/**)

The U.S. Geological Survey (USGS) website provides access to gauging stations throughout the Tallapoosa Basin. Exhibit A-1 lists the active stations in the Tallapoosa basin that have real-time, peak flow, daily flow, and/or water quality data associated with them. These data were included in all three CWP Dataviewers and were used in the assessment process.

EXHIBIT A-1
Active USGS Stations in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Station Number	Station Name
02413300	Little Tallapoosa River near Newell, Alabama
02412000	Tallapoosa River near Heflin, Alabama
02414500	Tallapoosa River at Wadley, Alabama
02414525	High Pine Creek near Roanoke, Alabama
02414715	Tallapoosa River near New Site, Alabama
02415000	Hillabee Creek near Hackneyville, Alabama
02416035	Sugar Creek near Alexander City, Alabama
02416481	Norrell Branch near Dadeville, Alabama
02419625	Calebee Creek near Tuskegee, Alabama
02418760	Chewacla Creek at Chewacla State Park near Auburn, Alabama
02419835	Chubbahatchee Creek near Friendship, Alabama
02418230	Saugahatchee Creek at Co. Rd. 188 near Loachapoka, Alabama
02418000	Tallapoosa River at Cherokee Bluffs near Tallassee, Alabama
02419500	Tallapoosa River at Milstead, Alabama
02418500	Tallapoosa River below Tallassee, Alabama
02419890	Tallapoosa River near Montgomery, Water Works and Sanitary Sewer Board of the City of Montgomery, Alabama
02419000	Uphapee Creek near Tuskegee, Alabama

Auburn University

The Fisheries and Allied Aquacultures Department in the College of Agriculture has studied water quality and biota in the Tallapoosa River Basin extensively. Data gathered by the

department was used in the assessment process and included in the Middle and Lower Tallapoosa Dataviewers.

Tuskegee University

The Agricultural and Environmental Science department in the College of Agricultural, Environmental, and Natural Sciences has been studying the Uphapee, Calebee, and Cubahatchee watersheds since 2001. This information was used during the assessment process and included in the Lower Tallapoosa Dataviewer.

Water Works Sanitary and Sewer Board of the City of Montgomery

The Water Works and Sanitary Sewer Board of the City of Montgomery (MWWSSB) has been monitoring the water quality of the locations listed in Exhibit A-2 since March 2000. They monitor basic water quality parameters (dissolved oxygen, temperature, and pH), bacteria levels (total coliform and E. coli), nutrients (such as nitrates, ammonia, and total Kjeldahl nitrogen [TKN]), and other parameters (total dissolved solids [TDS] and total suspended solids [TSS]). These data were included in the Lower Tallapoosa CWP Dataviewer and used in the assessment process.

EXHIBIT A-2
MWWSSB Monitoring Locations
Tallapoosa River Basin Management Plan

Station Number	Station Name
A	Harwell Mill Creek
B	Unnamed Creek
D	Marl Creek
F	Brenshaw Branch
H	Goodwater Creek
J	Tumkeehatchee Creek
L	Wallahatchee Creek
M	Uphapee Creek
O	Calebee Creek
Q	Cubahatchee Creek
R	Line Creek
S	Millie's Creek
V	Jenkins Creek

Auburn Water Works Board

The Auburn Water Works Board (AWWB) has been monitoring the water quality of the locations listed in Exhibit A-3 since 1989. The AWWB monitors basic water quality parameters (alkalinity, dissolved oxygen, pH, hardness, temperature, TDS, and turbidity), bacteria levels (fecal coliform and total coliform), nutrients (such as nitrate, ammonia, total nitrogen, orthophosphate, and total phosphorus), metals (such as aluminum, copper, iron, lead, and magnesium), and other parameters (such as chlorophyll *a*, calcium, potassium, and sodium). These data were included in the Lower Tallapoosa CWP Dataviewer and used in the assessment process.

EXHIBIT A-3
AWWB Monitoring Locations
Tallapoosa River Basin Management Plan

Station Name	Station Description
C1	Chewacla Creek
C2	Chewacla Creek
C3	Chewacla Creek
C4	Chewacla Creek
C5	Chewacla Creek
C6	Chewacla Creek
C7	Chewacla Creek
C8	Chewacla Creek
C9	Chewacla Creek
HQ1	Tributary to Chewacla Creek
L1	Lake Ogletree
L2	Lake Ogletree
L3	Lake Ogletree
L4	Lake Ogletree
L5	Lake Ogletree
L6	Lake Ogletree
T1	Nash Creek
T10	Tributary to Chewacla Creek
T11	Robinson Creek
T12	Tributary to Chewacla Creek
T12N	Tributary to Chewacla Creek
T13	Tributary to Chewacla Creek

EXHIBIT A-3
AWWB Monitoring Locations
Tallapoosa River Basin Management Plan

Station Name	Station Description
T14	Tributary to Chewacla Creek
T15	Tributary to Chewacla Creek
T16	Tributary to Chewacla Creek
T17	Tributary to Chewacla Creek
T18	Tributary to Chewacla Creek
T19	Tributary to Chewacla Creek
T2	Nash Creek
T20	Tributary to Chewacla Creek
T21/C7'	Tributary to Chewacla Creek
T22	Robinson Creek
T23	Tributary to Chewacla Creek
T24	Tributary to Chewacla Creek
T25	Tributary to Chewacla Creek
T26	Tributary to Chewacla Creek
T27	Tributary to Chewacla Creek
T28	Tributary to Chewacla Creek
T29	Tributary to Chewacla Creek
T3	Tributary to Chewacla Creek
T30	Tributary to Chewacla Creek
T31	Tributary to Chewacla Creek
T4	Tributary to Chewacla Creek
T5	Tributary to Chewacla Creek
T6	Tributary to Chewacla Creek
T7	Tributary to Chewacla Creek
T8	Tributary to Chewacla Creek
T9	Tributary to Chewacla Creek

City of Alexander City

The City of Alexander City has contracted with Auburn University's Fisheries Department to monitor the water quality of Lake Martin since the relocation of the diffuser outfall from

Sugar Creek to Lake Martin. Auburn University sampled the water from April through October 2003. These data were included in the Middle Tallapoosa Dataviewer and used in the assessment process.

Russell Corporation

Russell Corporation has been monitoring storm water runoff from its facility since 1994. This information was included in the Middle Tallapoosa Dataviewer.

APPENDIX B

Abbreviated Draft 2004 §303(d) List for Alabama

TABLE B-1
Draft 2004 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03150108-1004-300	Wolf Creek	Partial	R	M	Tallapoosa	Randolph	Fish & Wildlife	Pathogens	Feedlots	1990	4.0 miles	Little Tallapoosa River / Its source	Yes	2002
AL03150109-0503-401	Sugar Creek	Non	R	H	Tallapoosa	Tallapoosa	Fish & Wildlife	Chlorine Nutrients	Municipal	1990-96	4.8 miles	Elkahatchee Creek / Sugar Creek Alexander City	No	2004
AL03150110-0204-101	Yates Reservoir (Sougahatchee Creek Embayment)	Non	L	H	Tallapoosa	Tallapoosa	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Industrial Municipal Non-irrigated crop production Pasture grazing	1994-97	224 acres	Sougahatchee Creek Embayment / NW1/4, S21, T19N, R22E	Yes	2003
AL03150110-0201-700	Pepperell Branch	Non	R	H	Tallapoosa	Lee	Fish & Wildlife	Nutrients	Industrial	1988	6.5 miles	Sougahatchee Creek / Its source	Yes	2003
AL03150110-0504-101	Calebee Creek	Non	R	H	Tallapoosa	Macon	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10 miles	Tallapoosa River / Macon County Road 9	No	2003

TABLE B-1
Draft 2004 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03150110-0703-100	Cubahatchee Creek	Non	R	H	Tallapoosa	Macon Bullock	Swimming Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	41 miles	Tallapoosa River / Its source	No	2003
AL03150110-0903-101	Line Creek	Partial	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10.0 miles	Tallapoosa River / Johnson Creek	No	2003
AL03150110-0903-102	Line Creek	Partial	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation	Agriculture Surface mining	1996	5.1 miles	Johnsons Creek / Panther Creek	No	2003
AL03150110-0301-400	Moores Mill Creek	Non	R	L	Tallapoosa	Lee	Swimming Fish & Wildlife	Siltation	Land development Urban runoff/ storm sewers	1998	10.1 miles	Chewacla Creek / Its source	No	2003

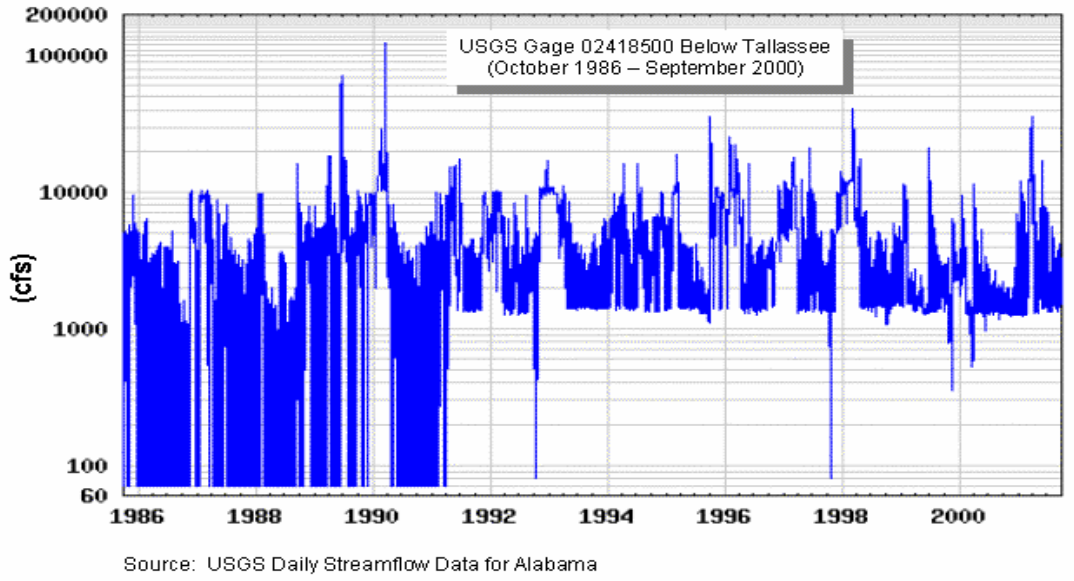
Notes:
DO = dissolved oxygen
Source: ADEM Website (http://www.adem.state.al.us/PublicNotice/Feb/303(d)%20List.htm)

APPENDIX C

Water Quantity Information

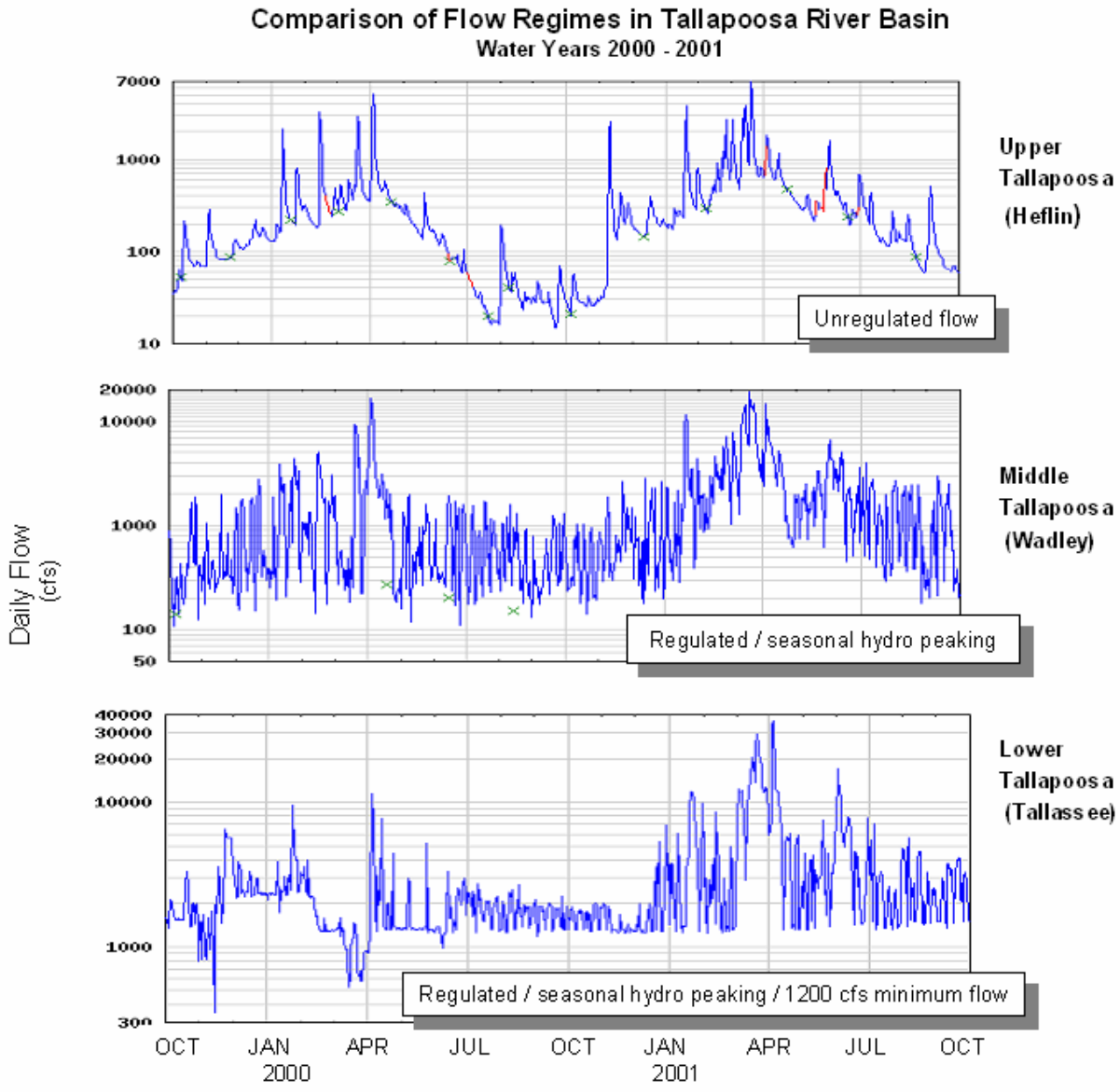
Alabama Power Company (APCo) operates its reservoir projects in the basin to meet a minimum flow of 1,200 cubic feet per second (cfs) below Thurlow Dam at Tallahassee and to fulfill downstream an Alabama-Coosa-Tallapoosa (ACT) River Basin system-wide requirement to maintain a flow of 4,640 cfs at Montgomery. Exhibit C-1 illustrates the change in the river's flow regime since the 1,200-cfs minimum daily discharge requirement was established for Thurlow Dam in 1991. The resulting flow augmentation substantially improved the aquatic habitats in the Lower Tallapoosa segment, especially for fish spawning and survival needs.

EXHIBIT C-1
Effect of 1,200-cfs Minimum Flow below Thurlow Dam
Tallapoosa River Basin Management Plan



Additional effects of the reservoir operations on the Tallapoosa's flow regime can be seen in the comparison hydrographs of daily flow rates for the U.S. Geological Survey (USGS) gage stations in the upper segment (Heflin), the middle segment (Wadley), and the lower segment for Tallassee for the drought years 2000 and 2001(Exhibit C-2). The hydrograph for Heflin illustrates the unregulated, natural flow regime of the river. The Wadley gage data show the effects of hydro-peaking operations at the R. L. Harris Dam. These effects are addressed further in Section 5 of this management plan. The Tallassee hydrograph shows the aggregate effect of how the flow attenuation and augmentation affect the downstream flows in the lower segment of the basin.

EXHIBIT C-2
Flow Regimes in the Upper, Middle, and Lower Tallapoosa Basin Segments
Tallapoosa River Basin Management Plan



Data Source: USGS Data for Tallapoosa River Gages 02412000, 02414500, and 02418500.

APPENDIX D

Water Use Data

EXHIBIT D-1
Surface and Groundwater Usage in the 11-digit HUCs in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Subwatershed Name	11-Digit HUC	Water Usage Type	Annual Average (mgd)
Tallapoosa River	03150108110	Groundwater	0.002
Cahulga Creek	03150108120	Surface Water	0.591
Chulafinnee Creek	03150108140	Groundwater	0.644
Ketchepedrakee Creek	03150108150	Groundwater	0.003
Tallapoosa River	03150108160	Groundwater	0.059
Mad Indian Creek	03150108170	Groundwater	0.032
Upper Little Tallapoosa River	03150108240	Surface Water	0.292
Cohobadiah Creek	03150108250	Groundwater	0.002
Crooked Creek	03150108030	Surface Water	1.550
High Pine Creek	03150109070	Surface Water	1.496
Chatahospee Creek	03150109100	Surface Water	0.344
Enitachopco Creek	03150109150	Groundwater	0.001
Hillabee Creek	03150109170	Surface Water	0.172
Tallapoosa River	03150109180	Groundwater	0.008
Elkahatchee Creek	03150109190	Surface Water	10.138
Sandy Creek	03150109200	Surface Water	0.582
Oakachoy Creek	03150109220	Groundwater	0.003
Oakachoy Creek	03150109220	Surface Water	0/920
Wind Creek	03150110010	Groundwater	0.011
Sougahatchee Creek	03150110030	Surface Water	5.791
Stone Creek	03150110040	Surface Water	1.935
Chewacla Creek	03150110050	Groundwater	0.804
Chewacla Creek	03150110050	Surface Water	6.681
Opintlocco Creek	03150110060	Surface Water	0.821
Uphapee Creek	03150110070	Groundwater	0.647
Uphapee Creek	03150110070	Surface Water	0.178

EXHIBIT D-1
Surface and Groundwater Usage in the 11-digit HUCs in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Subwatershed Name	11-Digit HUC	Water Usage Type	Annual Average (mgd)
Tallapoosa River	03150110080	Groundwater	0.079
Tallapoosa River	03150110080	Surface Water	3.233
Tumkeehatchee Creek	03150110090	Surface Water	0.089
Calebee Creek	03150110100	Groundwater	0.304
Calebee Creek	03150110100	Surface Water	0.138
Cubahatchee Creek	03150110120	Groundwater	0.207
Cubahatchee Creek	03150110120	Surface Water	3.078
Old Town Creek	03150110130	Groundwater	0.473
Line Creek	03150110140	Groundwater	0.081
Chubbehatchee Creek	03150110160	Groundwater	0.060
Chubbehatchee Creek	03150110160	Surface Water	2.010
Jenkins Creek	03150110170	Groundwater	0.818
Jenkins Creek	03150110170	Surface Water	23.782
Harwells Mill Creek	03150110180	Groundwater	0.058

Notes:
Source: ADECA, OWR, 2004
HUC = hydrologic unit code
mgd = million gallons per day

TABLE D-2
Surface Water Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply		Commercial	Domestic	Industrial		Thermoelectric		Mining		Livestock	Aquaculture		Irrigation	Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Autauga	0.00			0.00	26.60	0.00	0.00	0.00				0.00		0.40	27.00	0.00
Baldwin	0.00			0.00	5.70	0.00	0.00	0.00				0.00		17.00	22.70	0.00
Barbour	0.00			0.00	0.00	0.00	0.00	0.00				0.00		17.60	17.60	0.00
Bibb	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Blount	29.26			0.00	0.00	0.00	0.00	0.00				0.00		0.45	29.71	0.00
Bullock	0.00			0.00	0.00	0.00	0.00	0.00				0.00		5.20	5.20	0.00
Butler	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Calhoun	3.21			0.00	0.00	0.00	0.00	0.00				0.00		4.80	8.01	0.00
Chambers	6.20			0.00	5.70	0.00	0.00	0.00				0.00		0.90	12.80	0.00
Cherokee	1.91			0.00	0.00	0.00	0.00	0.00				1.44		13.70	17.05	0.00
Chilton	1.40			0.00	0.00	0.00	0.00	0.00				0.00		0.00	1.40	0.00
Choctaw	0.00			0.00	50.00	0.00	0.00	0.00				0.00		0.00	50.00	0.00
Clarke	0.29			0.00	20.00	0.00	0.00	0.00				0.00		0.00	20.29	0.00
Clay	1.10			0.00	0.00	0.00	0.00	0.00				0.00		0.00	1.10	0.00
Cleburne	0.59			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.59	0.00
Coffee	0.00			0.00	0.00	0.00	0.00	0.00				0.00		28.50	28.50	0.00
Colbert	7.31			0.00	82.60	0.00	1,251	0.00				0.00		8.00	1,348.91	0.00
Conecuh	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Coosa	0.34			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.34	0.00

TABLE D-2
Surface Water Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply		Commercial	Domestic	Industrial		Thermoelectric		Mining		Livestock	Aquaculture		Irrigation	Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Covington	0.00			0.00	0.00	0.00	20.80	0.00				0.00		6.00	26.80	0.00
Crenshaw	0.00			0.00	0.00	0.00	0.00	0.00				0.00		2.40	2.40	0.00
Cullman	39.60			0.00	1.15	0.00	0.00	0.00				0.00		0.33	41.08	0.00
Dale	0.00			0.00	0.00	0.00	0.00	0.00				0.00		5.10	5.10	0.00
Dallas	0.00			0.00	40.00	0.00	0.00	0.00				0.00		1.40	41.40	0.00
De Kalb	15.60			0.00	0.00	0.00	0.00	0.00				0.00		0.80	16.40	0.00
Elmore	2.10			0.00	0.00	0.00	0.00	0.00				0.00		4.40	6.50	0.00
Escambia	0.00			0.00	34.00	0.00	0.00	0.00				0.00		3.60	37.60	0.00
Etowah	19.00			0.00	18.30	0.00	150	0.00				0.00		9.50	196.80	0.00
Fayette	1.57			0.00	0.50	0.00	0.00	0.00				0.00		0.00	2.07	0.00
Franklin	3.00			0.00	0.00	0.00	0.00	0.00				0.00		0.02	3.02	0.00
Geneva	0.00			0.00	0.00	0.00	0.00	0.00				0.00		6.90	6.90	0.00
Greene	0.00			0.00	0.00	0.00	357.28	0.00				0.00		0.00	357.28	0.00
Hale	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.04	0.04	0.00
Henry	0.00			0.00	0.00	0.00	0.00	0.00				0.00		20.00	20.00	0.00
Houston	0.00			0.00	0.00	0.00	104.12	0.00				0.00		12.30	116.42	0.00
Jackson	5.95			0.00	9.18	0.00	1,546	0.00				0.00		3.00	1,564.13	0.00
Jefferson	45.18			0.00	0.00	0.00	37.88	0.00				0.00		0.08	83.14	0.00
Lamar	0.00			0.00	0.00	0.00	0.00	0.00				0.00		11.00	11.00	0.00

TABLE D-2
Surface Water Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply		Commercial	Domestic	Industrial		Thermoelectric		Mining		Livestock	Aquaculture		Irrigation	Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Lauderdale	12.00			0.00	0.00	0.00	0.00	0.00				0.00		2.71	14.71	0.00
Lawrence	2.10			0.00	55.80	0.00	0.00	0.00				0.00		6.74	64.64	0.00
Lee	11.50			0.00	2.40	0.00	0.00	0.00				0.00		12.30	26.20	0.00
Limestone	8.10			0.00	0.00	0.00	2,106.67	0.00				0.00		27.70	2,142.47	0.00
Lowndes	0.00			0.00	0.00	0.00	0.00	0.00				0.00		3.42	3.42	0.00
Macon	3.00			0.00	0.00	0.00	0.00	0.00				0.00		7.04	10.04	0.00
Madison	20.00			0.00	1.34	0.00	0.00	0.00				0.00		8.44	29.78	0.00
Marengo	0.00			0.00	18.20	0.00	0.00	0.00				0.00		0.25	18.45	0.00
Marion	4.96			0.00	0.00	0.00	0.00	0.00				0.00		0.00	4.96	0.00
Marshall	15.60			0.00	0.00	0.00	0.00	0.00				0.00		0.12	15.72	0.00
Mobile	125.00			0.00	18.00	0.00	1,111.79	0.00				0.00		2.00	1,256.79	0.00
Monroe	0.00			0.00	59.00	0.00	0.00	0.00				0.00		1.60	60.60	0.00
Montgomery	23.20			0.00	0.70	0.00	0.00	0.00				0.00		2.40	26.30	0.00
Morgan	32.72			0.00	124.32	0.00	0.00	0.00				0.00		1.70	158.74	0.00
Perry	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Pickens	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.13	0.13	0.00
Pike	0.00			0.00	0.00	0.00	0.00	0.00				0.00		18.50	18.50	0.00
Randolph	1.36			0.00	0.00	0.00	0.00	0.00				0.00		0.00	1.36	0.00
Russell	7.00			0.00	22.80	0.00	0.00	0.00				0.00		10.00	39.80	0.00

TABLE D-2
Surface Water Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply		Commercial	Domestic	Industrial		Thermoelectric		Mining		Livestock	Aquaculture		Irrigation	Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
St Clair	0.50			0.00	0.00	0.00	0.00	0.00				0.00		0.01	0.51	0.00
Shelby	1.54			0.00	0.01	0.00	763.94	0.00				0.00		5.30	770.79	0.00
Sumter	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Talladega	8.40			0.00	73.60	0.00	0.00	0.00				0.00		0.50	82.50	0.00
Tallapoosa	10.70			0.00	0.00	0.00	0.00	0.00				0.00		3.60	14.30	0.00
Tuscaloosa	23.20			0.00	1.96	0.00	0.00	0.00				0.00		2.20	27.36	0.00
Walker	58.34			0.00	0.00	0.00	632.88	0.00				0.00		0.67	691.89	0.00
Washington	0.32			0.00	4.80	0.00	107.61	0.00				0.00		0.18	112.91	0.00
Wilcox	0.00			0.00	23.00	0.00	0.00	0.00				0.00		0.00	23.00	0.00
Winston	0.00			0.00	0.00	0.00	0.00	0.00				0.00		0.00	0.00	0.00
Total:	553.15			0.00	699.66	0.00	8,189.97	0.00				1.44		300.93	9,745.15	0.00

Note:
Source: USGS Water Resources Division – Will Mooty

TABLE D-3
Groundwater Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply	Commercial	Domestic	Industrial		Thermoelectric	Mining		Livestock	Aquaculture	Irrigation		Total		
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Autauga	5.70			2.95	1.69	0.00	0.00				0.00		0.29	10.63	0.00
Baldwin	19.70			2.46	0.79	0.00	0.00				0.00		35.50	58.45	0.00
Barbour	4.85			0.51	0.94	0.00	0.00				0.00		1.03	7.33	0.00
Bibb	3.78			0.22	0.00	0.00	0.00				0.00		0.00	4.00	0.00
Blount	2.55			0.38	0.00	0.00	0.00				0.00		0.00	2.93	0.00
Bullock	2.50			0.09	0.00	0.00	0.00				0.00		0.00	2.59	0.00
Butler	3.35			0.17	0.25	0.00	0.00				0.00		0.14	3.91	0.00
Calhoun	18.80			0.97	1.28	0.00	0.00				0.00		0.00	21.05	0.00
Chambers	0.01			0.27	0.00	0.00	0.00				0.00		0.00	0.28	0.00
Cherokee	1.20			0.18	0.00	0.00	0.00				0.00		0.06	1.44	0.00
Chilton	2.11			1.10	0.49	0.00	0.00				0.00		0.03	3.73	0.00
Choctaw	1.08			0.63	0.00	0.00	0.00				0.00		0.00	1.71	0.00
Clarke	2.29			0.24	0.00	0.00	0.00				0.00		0.00	2.53	0.00
Clay	0.00			0.57	0.00	0.00	0.00				0.00		0.00	0.57	0.00
Cleburne	0.06			0.81	0.62	0.00	0.00				0.00		0.00	1.49	0.00
Coffee	7.13			0.82	3.00	0.00	0.00				0.00		0.83	11.78	0.00
Colbert	0.74			0.63	3.00	0.00	0.00				0.00		4.17	8.54	0.00
Conecuh	1.56			0.11	0.82	0.00	0.00				0.00		0.00	2.49	0.00

TABLE D-3
Groundwater Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply	Commercial	Domestic	Industrial		Thermoelectric	Mining		Livestock	Aquaculture	Irrigation		Total		
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Coosa	0.01			0.30	0.00	0.00	0.00				0.00		0.00	0.31	0.00
Covington	6.63			0.28	0.47	0.00	0.00				0.00		0.07	7.45	0.00
Crenshaw	1.85			0.10	0.00	0.00	0.00				0.00		0.00	1.95	0.00
Cullman	0.00			0.58	0.00	0.00	0.00				0.00		0.00	0.58	0.00
Dale	6.88			0.94	0.00	0.00	0.00				0.00		0.28	8.10	0.00
Dallas	10.02			0.94	0.34	0.00	0.00				1.65		1.69	14.64	0.00
De Kalb	1.05			0.48	0.86	0.00	0.00				0.00		0.00	2.39	0.00
Elmore	3.33			0.54	0.00	0.00	0.00				0.00		0.33	4.20	0.00
Escambia	5.60			0.60	1.33	0.00	0.00				0.00		7.56	15.09	0.00
Etowah	3.91			1.24	0.00	0.00	0.00				0.00		0.00	5.15	0.00
Fayette	0.06			0.72	0.00	0.00	0.00				0.00		0.00	0.78	0.00
Franklin	1.04			0.76	0.00	0.00	0.00				0.00		0.00	1.80	0.00
Geneva	1.69			0.91	0.14	0.00	0.00				0.00		0.13	2.87	0.00
Greene	0.78			0.44	0.01	0.00	0.00				1.06		1.06	3.35	0.00
Hale	2.38			0.55	0.04	0.00	0.00				2.91		5.51	11.39	0.00
Henry	1.83			0.12	0.25	0.00	0.00				0.00		3.89	6.09	0.00
Houston	18.92			1.91	1.33	0.00	0.00				0.00		13.88	36.04	0.00
Jackson	1.27			0.69	0.04	0.00	0.00				0.00		0.00	2.00	0.00

TABLE D-3
Groundwater Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply	Commercial	Domestic	Industrial		Thermoelectric	Mining		Livestock	Aquaculture	Irrigation		Total		
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Jefferson	13.90			4.95	0.30	0.00	0.00				0.43		1.13	20.71	0.00
Lamar	1.71			0.12	0.07	0.00	0.00				0.00		0.00	1.90	0.00
Lauderdale	1.14			1.74	0.00	0.00	0.00				0.00		0.00	2.88	0.00
Lawrence	0.00			1.11	0.00	0.00	0.00				0.00		0.00	1.11	0.00
Lee	1.20			0.86	0.00	0.00	0.00				0.00		0.07	2.13	0.00
Limestone	2.72			0.62	0.00	0.00	0.00				0.00		4.06	7.40	0.00
Lowndes	1.41			0.28	0.00	0.00	0.00				0.00		1.30	2.99	0.00
Macon	0.36			0.42	0.06	0.00	0.00				0.00		0.44	1.28	0.00
Madison	29.96			0.20	0.00	0.00	0.00				0.00		7.25	37.41	0.00
Marengo	2.18			0.56	0.80	0.00	0.00				1.38		1.38	6.30	0.00
Marion	0.38			0.23	0.00	0.00	0.00				0.00		0.00	0.61	0.00
Marshall	2.53			0.10	0.76	0.00	0.00				0.00		0.12	3.51	0.00
Mobile	11.03			6.73	21.18	0.00	0.00				0.00		8.26	47.20	0.00
Monroe	5.30			15.56	0.39	0.00	0.00				0.00		4.03	25.28	0.00
Montgomery	21.10			1.68	0.29	0.00	0.00				0.00		0.71	23.78	0.00
Morgan	0.00			1.22	3.12	0.00	0.00				0.00		0.00	4.34	0.00
Perry	2.72			0.33	0.00	0.00	0.00				0.58		0.58	4.21	0.00
Pickens	2.70			0.11	0.12	0.00	0.00				0.00		0.03	2.96	0.00

TABLE D-3
Groundwater Withdrawals (mgd) in Counties in the Tallapoosa River Basin–2000
Tallapoosa River Basin Management Plan

	Public Supply	Commercial	Domestic	Industrial		Thermoelectric	Mining		Livestock	Aquaculture	Irrigation		Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Pike	4.42			0.64	0.00	0.00	0.00				0.00		5.16	10.22	0.00
Randolph	0.00			0.88	0.00	0.00	0.00				0.00		0.00	0.88	0.00
Russell	1.14			0.00	0.11	0.00	0.00				0.00		0.00	1.25	0.00
St Clair	5.54			1.97	0.00	0.00	0.00				0.00		0.11	7.62	0.00
Shelby	11.19			2.39	0.00	0.00	0.00				0.00		5.16	18.74	0.00
Sumter	1.49			0.80	0.00	0.00	0.00				0.00		0.00	2.29	0.00
Talladega	7.06			2.54	1.51	0.00	0.00				0.00		0.00	11.11	0.00
Tallapoosa	0.02			0.31	0.00	0.00	0.00				0.00		0.00	0.33	0.00
Tuscaloosa	3.37			4.32	0.35	0.00	0.00				0.75		7.18	15.97	0.00
Walker	0.11			1.21	0.11	0.00	0.00				0.00		0.00	1.43	0.00
Washington	1.07			0.87	9.17	0.00	0.00				0.00		0.00	11.11	0.00
Wilcox	0.66			0.34	0.00	0.00	0.00				0.17		0.17	1.34	0.00
Winston	0.23			0.58	0.00	0.00	0.00				0.00		0.00	0.81	0.00
Total:	281.30			78.88	56.03	0.00	0.00				8.93		123.59	548.73	0.00

Note:
Source: U.S. Geological Survey Resources Division, Will Mooty.

APPENDIX E

Sociological Setting

Generally speaking, the concentration of urban population increases from north to south within the Tallapoosa River Basin. As the data in Exhibit E-1 show, four of the five most urban counties in the basin (Lee, Macon, Montgomery, and Russell counties) fall within the boundaries of the Lower Tallapoosa River watershed. However, it is important to note that the urbanized areas within Russell and Chambers counties (two of the most urban counties in the basin) fall outside the basin's boundaries. In contrast, all three counties that comprise the Upper Tallapoosa River watershed (Clay, Cleburne, and Randolph counties) are among the four most rural counties in the basin, as well as the most rural in the entire State of Alabama.

EXHIBIT E-1
Urban and Rural Population in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Population Area	Total Population	Urban	Percent Urban	Rural	Percent Rural
Montgomery County	223,510	196,892	88%	26,618	12%
Lee County	115,092	77,197	67%	37,895	33%
Russell County	49,756	31,895	64%	17,861	36%
Chambers County	36,583	18,374	50%	18,209	50%
Macon County	24,105	12,005	50%	12,100	50%
Elmore County	65,874	25,069	38%	40,805	62%
Bullock County	11,714	4,139	35%	7,575	65%
Tallapoosa County	41,475	10,265	25%	31,210	75%
Randolph County	22,380	4,873	22%	17,507	78%
Coosa County	12,202	317	3%	11,885	97%
Clay County	14,254	0	0%	14,254	100%
Cleburne County	14,123	0	0%	14,123	100%

Notes:
Source: U.S. Department of Commerce, Bureau of the Census, 2000
Population, Summary File 1, Table P2. Special tabulation by the Alabama State Data Center.

The distribution of major cities in the basin also reflects this pattern of progressively higher population densities from the northern to the southern reaches of the river. The highest concentration of cities with populations of 10,000 or more (according to the 2000 Census) is located in the Lower Tallapoosa River section. The cities of Montgomery (201,568), Auburn (42,987), Opelika (23,498), and Tuskegee (11,846) are all located in this watershed. In fact, the Montgomery and Auburn/Opelika metropolitan statistical areas are the only large

urbanized areas that extend into the basin. The largest city in the Middle Tallapoosa River watershed, Alexander City (15,008), is the only city in that watershed with a population of more than 10,000. Although the City of Roanoke's population was only 6,563 in 2000, it is the only other city in the entire basin with 5,000 or more persons. By contrast, the largest city in the Upper Tallapoosa River watershed is Heflin, which had a 2000 population of only 3,002.

Recent population growth trends in the basin counties, as illustrated in Exhibit E-2, document higher rates of growth in the urban counties. The counties with the highest rates of growth over the past two decades (1980 to 2000) were Elmore, Lee, and Montgomery. These counties represent three of the four counties within the basin that are part of a standard metropolitan statistical area (MSA), and are the three most populous counties in the basin, according to the 2000 Census. These counties also are located in the Lower Tallapoosa River watershed.

EXHIBIT E-2
Population Trends in the Tallapoosa River Basin (1980 to 2000)
Tallapoosa River Basin Management Plan

County	Total Population (U.S. Census)			% Change 1980-2000	% Change 1990-2000
	1980	1990	2000		
Bullock	10,596	11,042	11,714	10.6%	6.1%
Chambers	39,191	36,876	36,583	-6.7%	-0.8%
Clay	13,703	13,252	14,254	4.0%	7.6%
Cleburne	12,595	12,730	14,123	12.1%	10.9%
Coosa	11,377	11,063	12,202	7.3%	10.3%
Elmore	43,390	49,210	65,874	51.8%	33.9%
Lee	76,283	87,146	115,092	50.9%	32.1%
Macon	26,829	24,928	24,105	-10.2%	-3.3%
Montgomery	197,038	209,085	223,510	13.4%	6.9%
Randolph	20,075	19,881	22,380	11.5%	12.6%
Russell	47,356	46,860	49,756	5.1%	6.2%
Tallapoosa	38,676	38,826	41,475	7.2%	6.8%
Totals	**539,089**	**562,889**	**633,068**	**17.5%**	**12.5%**

Notes:
Source: U.S. Census Bureau

Two of the rural counties in the northern portions of the basin (Cleburne and Randolph) also recorded strong population gains in recent years, largely because of the ongoing gradual westward expansion of the suburban Atlanta market into Alabama along the I-20 corridor. The counties in the Middle Tallapoosa River section registered the most modest

rates of growth within the basin. These counties have been hardest hit by job losses in the textile industry, and are the farthest removed from large urban centers and major interstate highway corridors. The rural "black belt" counties of Chambers and Macon recorded the only population declines in the basin.

Overall, the Tallapoosa River Basin counties grew at a faster rate than the state as a whole. While the basin's counties grew by 17.5 percent between 1980 and 2000 and by 12.5 percent over the past decade, Alabama's population grew by the more modest rates of 14.2 percent and 10.1 percent, respectively.

The data in Exhibit E-3 show that only one county in the basin (Elmore) has fewer incidents of poverty than the state in all three measures. Elmore County benefits from the migration of relatively affluent households in the Montgomery metropolitan area. Likewise, the statistics for Montgomery County are close to the state averages. Although Cleburne County in the northern portions of the basin is rural, incomes there are supported by a growing influx of commuters from the Anniston and Atlanta metropolitan areas.

EXHIBIT E-3
Measures of Poverty in the Tallapoosa River Basin (1999)
Tallapoosa River Basin Management Plan

County/State	Percent of Population with Incomes below the Poverty Level	Percent of Households Receiving Public Assistance	Percent of Families with Incomes under 150% of the Poverty Level
Alabama	16.1%	2.2%	27.1%
Bullock	**33.4%**	**3.2%**	**49.3%**
Chambers	**17.0%**	**2.7%**	**30.8%**
Clay	**17.1%**	**2.7%**	**31.6%**
Cleburne	13.9%	2.0%	**29.4%**
Coosa	14.9%	**2.4%**	**30.2%**
Elmore	10.2%	1.3%	18.5%
Lee	**21.8%**	1.5%	**35.3%**
Macon	**32.8%**	**3.3%**	**45.4%**
Montgomery	**17.3%**	**2.4%**	24.8%
Randolph	**17.0%**	**2.4%**	**31.8%**
Russell	**19.9%**	**3.6%**	**34.0%**
Tallapoosa	**16.6%**	2.1%	**29.4%**

Notes:
Source: U.S. Census Bureau, 2000 Census

In contrast, 6 of the 12 counties in the basin (Bullock, Chambers, Clay, Macon, Randolph, and Russell) have greater incidents of poverty than the state in all three measures. The highest levels of poverty are found in the traditional "black belt" counties of Bullock and Macon, both of which are within the Lower Tallapoosa River watershed. Overall, the levels of poverty are greater in the southern, rural portions of the Tallapoosa River Basin. However, pockets of poverty are known to exist in all rural counties within the basin, regardless of their overall averages.

APPENDIX F

Water Use Classifications

EXHIBIT F-1
Water Use Classifications
Tallapoosa River Basin Management Plan

Stream	From	To	Classification
Beaverdam Creek	Tallapoosa River	Its Source	F&W
Bulger Creek	Uphapee Creek	Its Source	PWS/F&W
Cahulga Creek	Tallapoosa River	U.S. Highway 78	F&W
Cahulga Creek	U.S. Highway 78	Its Source	PWS/F&W
Calebee Creek	Tallapoosa River	Its Source	F&W
Chatahospee Creek	Tallapoosa River	Its Source	F&W
Chattasoka Creek	Sandy Creek	Its Source	F&W
Chewacla Creek	Chewacla State Park Lake (Moores Mill Creek)	Its Source	PWS/F&W
Chewacla Creek	Uphapee Creek	Chewacla State Park Lake (Moores Mill Creek)	F&W
Christian Creek	Oaktasasi Creek	Its Source	F&W
Coley Creek	Tallapoosa River (Lake Martin)	Its Source	F&W
Crooked Creek	Alabama Highway 9	Its Source	PWS/F&W
Crooked Creek	Tallapoosa River	Alabama Highway 9	F&W
Cubahatchee Creek	Tallapoosa River	Its Source	S/F&W
Dobbs Creek	Oaktasasi Creek	Its Source	F&W
Elkahatchee Creek	Alabama Highway 22	Its Source	F&W
Elkahatchee Creek	Alabama Highway 63	Alabama Highway 22	F&W
Elkahatchee Creek	Tallapoosa River (Lake Martin)	Alabama Highway 63	PWS/F&W
Finley Creek	Mill Creek	Its Source	PWS/F&W
Graves Creek	High Pine Creek	Its Source	F&W
Hackney Creek	Town Creek	Its Source	PWS/F&W
Harold Creek	Elkahatchee Creek	Its Source	F&W
Head Creek	Saugahatchee Creek	Its Source	F&W
High Pine Creek	U.S. Highway 431 Crossing	Its Source	PWS
High Pine Creek	Tallapoosa River	U.S. Highway 431 Crossing	F&W

EXHIBIT F-1
Water Use Classifications
Tallapoosa River Basin Management Plan

Stream	From	To	Classification
Hillabee Creek	Co. Rd. bridge 3 miles east of Hackneyville	Its Source	F&W
Hillabee Creek	Jct. of Oaktasasi and Towns Creek	Co. Rd. bridge 3 miles east of Hackneyville	PWS/F&W
Hillabee Creek	Tallapoosa River	Jct. of Oaktasasi and Towns Creek	F&W
Horsetrough Creek	Crooked Creek	Its Source	F&W
Hutton Creek	Tallapoosa River	Its Source	F&W
Jones Creek	High Pine Creek	Its Source	PWS
Little Kowaliga Creek (Lake Martin)	Big Kowaliga Creek (Lake Martin)	Reservoir Limits	PWS/S/F&W
Little Sandy Creek	Central Georgia RR	Its Source	PWS/F&W
Little Sandy Creek	South Fork of Sand Creek	Central of Georgia RR	F&W
Little Tallapoosa River	Five miles upstream of U.S. Highway 431	Alabama-Georgia State Line	F&W
Little Tallapoosa River (R.L. Harris Lake)	Tallapoosa River (R.L. Harris Lake)	U.S. Highway 431	S/F&W
Little Tallapoosa River (R.L. Harris Lake)	U.S. Highway 431	Five miles upstream of U.S. Highway 431	PWS/S/F&W
Manoy Creek	Tallapoosa River (Lake Martin)	Reservoir Limits (Lake Martin)	F&W
Mill Creek	Chatahospee Creek	Its Source	F&W
Moores Mill Creek	Chewacla Creek (Dam at Chewacla State Park Lake)	Its Source	S/F&W
North Fork of Sandy Creek	Sandy Creek	Its Source	F&W
Oakfuskee Creek (Line Creek)	Tallapoosa River	Its Source	F&W
Oaktasasi Creek	Hillabee Creek	Its Source	F&W
Old Town Creek	Oakfuskee Creek (Line Creek)	Its Source	F&W
Parkerson Mill Creek	Chewacla Creek	Its Source	F&W
Pepperell Branch	Saugahatchee Creek	Its Source	A&I
Sandy Creek	Tallapoosa River (Lake Martin)	Its Source	F&W
Saugahatchee Creek	Opelika water supply reservoir	Its Source	PWS/F&W
Saugahatchee Creek	Tallapoosa River	Opelika water supply reservoir	F&W

EXHIBIT F-1
Water Use Classifications
Tallapoosa River Basin Management Plan

Stream	From	To	Classification
South Fork of Sandy Creek	Sandy Creek	Its Source	F&W
Sugar Creek	Elkahatchee Creek	Its Source	F&W
Tallapoosa River	Alabama River	U.S. Highway 231	F&W
Tallapoosa River	Cleburne County Rd. 19	Alabama-Georgia State Line	F&W
Tallapoosa River	Four miles upstream of Randolph Co. Rd. 88 (Lee Bridge)	One-half mile upstream of Cleburne Co. Rd. 36	F&W
Tallapoosa River	Hillabee Creek	R. L. Harris Dam	F&W
Tallapoosa River	One-half mile upstream of Cleburne Co. Rd 36	Cleburne County Rd. 19	PWS/F&W
Tallapoosa River	Thurlow Dam	Yates Dam	PWS/S/F&W
Tallapoosa River	U.S. Highway 231	Thurlow Dam	PWS/F&W
Tallapoosa River	Yates Dam	Martin Dam	PWS/S/F&W
Tallapoosa River (Lake Martin)	U.S. Highway 280	Hillabee Creek	PWS/S/F&W
Tallapoosa River (Lake Martin)	Martin Dam	U.S. Highway 280	S/F&W
Tallapoosa River (R.L. Harris Lake)	R. L. Harris Dam	Four miles upstream of Randolph Co. Rd. 88 (Lee Bridge)	S/F&W
Town Creek	High Pine Creek	Its Source	F&W
Town Creek	Hillabee Creek	Its Source	F&W
Uphapee Creek	Tallapoosa River	Its Source	F&W
UT to Jones Creek northwest of Roanoke	Jones Creek	Its Source	PWS
Wedowee Creek	Little Tallapoosa River	Its Source	F&W

Notes:
PWS = Public Water Supply
S = Swimming
F&W = Fish & Wildlife
Source: ADEM Website (http://www.adem.state.al.us/WaterDivision/WQuality/WQUseClass.htm)

APPENDIX G

ADEM Water Quality Criteria

EXHIBIT G-1
Summary of ADEM's Water Use Classifications and Water Quality Criteria, January 2001
Tallapoosa River Basin Management Plan

Rank	Classification	Sewage, Industrial Waste or Other Waste	pH (s.u.)	Temperature (°F)	Dissolved Oxygen (mg/L)	Bacteria (colonies/100ml)	Turbidity (NTU)	Toxicity, Taste, Odor, and Color	Description
* [i]	Outstanding National Resource Water (ONRW)	No new or expanded point source discharges shall be allowed.							The water quality criteria are contingent upon the use classification of the specific waterbody that has been assigned the ONRW designation. For example, Little River has been designated as an ONRW waterbody; however, it has been classified by ADEM as a PWS, S, & F&W; therefore, the applicable water quality criteria associated with the PWS, S, & F&W classification apply.
1	Outstanding Alabama Water (OAW)	No new or expanded point source discharges allowed, unless no other feasible alternative can be demonstrated to the satisfaction of the Department.	6.0-8.5	Shall not exceed 90 °F; (86°F)[ii] Maximum in-stream rise above ambient conditions shall not exceed 5°F; (4.0/1.5 °F)[iii]	Shall not be less than 5.5	Fecal coliform group shall not exceed a geometric mean of 100 (coastal waters) and 200 (all other waters)	Shall not exceed 50 NTUs above background	Must meet all toxicity requirements, not affect propagation or palatability of fish/shellfish, or affect aesthetic values	
2	Public Water Supply (PWS)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 °F; (86°F) Maximum in-stream rise above ambient conditions shall not exceed 5°F; (4.0/1.5 °F)	Shall not be less than 5.0	1,000 geometric mean 2,000 max. single sample (year-round) [100 (coastal waters) and 200 (all other waters) Jun-Sep][iv]	Shall not exceed 50 NTUs above background	Shall not render waters unsafe or unsuitable for drinking supply or food processing; must meet all toxicity requirements and not affect fish palatability	
3	Swimming and Other Whole Body Water-Contact Sports (S)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 °F; (86°F) Maximum in-stream rise above ambient conditions shall not exceed 5°F; (4.0/1.5 °F)	Shall not be less than 5.0	Fecal coliform group shall not exceed a geometric mean of 100 (coastal waters) and 200 (all other waters)	Shall not exceed 50 NTUs above background	Shall not render the water unsafe for water-contact; not exhibit acute or chronic toxicity; not impair fish palatability or affect the aesthetic value	
4	Shellfish Harvesting (SH)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 °F; (86°F) Maximum in-stream rise above ambient conditions shall not exceed 5°F; (4.0/1.5 °F)	Shall not be less than 5.0	Fecal coliform group shall not exceed a geometric mean of 100 (coastal waters) and 200 (all other waters). Not to exceed FDA limits[v]	Shall not exceed 50 NTUs above background	Shall not exhibit acute or chronic toxicity; not affect marketability or palatability of fish and shellfish or affect the aesthetic value	
5	Fish and Wildlife (F&W)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 °F; (86°F) Maximum in-stream rise above ambient conditions shall not exceed 5°F; (4.0/1.5 °F)	Shall not be less than 5.0	1,000 geometric mean 2,000 max. single sample (year-round) [100 (coastal waters) and 200 (all other waters) Jun-Sep][vi]	Shall not exceed 50 NTUs above background	Shall not exhibit acute or chronic toxicity; not affect marketability or palatability of fish and shellfish or affect the aesthetic value	

EXHIBIT G-1
Summary of ADEM's Water Use Classifications and Water Quality Criteria, January 2001
Tallapoosa River Basin Management Plan

Rank	Classification	Sewage, Industrial Waste or Other Waste	pH (s.u.)	Temperature (^{o}F)	Dissolved Oxygen (mg/L)	Bacteria (colonies/100ml)	Turbidity (NTU)	Toxicity, Taste, Odor, and Color	Description
6	Limited Warmwater Fishery (LWF)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 ^{o}F; (86^{o}F) Maximum in-stream rise above ambient conditions shall not exceed 5^{o}F; (4.0/1.5 ^{o}F)	Shall not be less than 5.0 (Dec-Apr) Shall not be less than 3.0 (May-Nov)	Fecal coliform group shall not exceed a geometric mean of 1000 (coastal waters) and 2000 for any single sample	Shall not exceed 50 NTUs above background	Shall not exhibit acute or chronic toxicity; shall not render waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, industrial process water supply, fish survival, or interfere with downstream water uses.	
7	Agricultural and Industrial Water Supply (A&I)	Must be treated or controlled in accordance with ADEM Rule 335-6-10-.08	6.0-8.5	Shall not exceed 90 ^{o}F; (86^{o}F) Rise above ambient conditions shall not exceed 5^{o}F.	Shall not be less than 3.0	Fecal coliform group shall not exceed a geometric mean of 2000; nor exceed a maximum of 4000 for any single sample	Shall not exceed 50 NTUs above background	Shall not render waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, industrial process water supply, fish survival, or interfere with downstream water uses.	

[i] ONRW is a special designation and is not defined as a separate use classification. Specific water quality criteria are dependent on the particular waterbody and its associated use classification.
[ii] For streams, lakes, and reservoirs in the Tennessee and Cahaba River Basins, and for specific segments of the Tallapoosa River Basin that have been designated by the Alabama Department of Conservation and Natural Resources as supporting smallmouth bass, sauger, or walleye, the in-stream temperature shall not exceed 86^{o}F.
[iii] The maximum in-stream temperature rise above ambient water temperature due to the addition of artificial heat by a discharger shall not exceed 4^{o}F in coastal or estuarine waters during the period October through May, nor shall the rise exceed 1.5^{o}F during the period June through September.
[iv] For incidental water contact and recreation during June through September, the bacterial quality of the water is acceptable when a sanitary survey by the controlling health authority reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 100 col/100 mL (coastal waters) and 200 col/100 mL (other waters).
[v] Not to exceed the limits specified in the latest edition of the *National Shellfish Sanitation Program Manual of Operations, Sanitation of Shellfish Growing Areas* (1965), published by the Food and Drug Administration, U.S. Department of Health and Human Services.
[vi] For incidental water contact and recreation during June through September, the bacterial quality of the water is acceptable when a sanitary survey by the controlling health authority reveals no source of dangerous pollution and when the geometric mean fecal coliform organism density does not exceed 100 col/100 mL (coastal waters) and 200 col/100 mL (other waters).

APPENDIX H

NPDES Permits and Other Registrations

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG180327	ANDY'S AUTO PARTS	INDUSTRIAL	NO	WEDOWEE CREEK		03150108
ALG200032	ASSOCIATED RUBBER COMPANY PROBLEND	INDUSTRIAL	NO	MUSCADINE CREEK		03150108
ALG180441	CAMMCO INC	INDUSTRIAL	NO	UT CHULAFINNEE CREEK		03150108
ALP920137	CROWNTUFT MANUFACTURING	INDUSTRIAL	NO			03150108
ALP30041	CROWNTUFT MFG CORP	INDUSTRIAL	NO			03150108
ALG340340	H FLOY LOVVORN ESTATE	INDUSTRIAL	NO	UT SHOAL CREEK		03150108
AL0056146	HEFLIN WASTEWATER TREATMENT LAGOON	MUNICIPAL	NO	TALLAPOOSA RIVER	0.6	03150108
AL0052175	HEFLIN WATER TREATMENT PLANT	MUNICIPAL	NO	CAHULGA CREEK	0.0167	03150108
AL0045306	I 20 WELCOME CENTER LAGOON	MUNICIPAL	NO	KEMP CREEK	0.013	03150108

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0074560	MICAVILLE PROCESSING PLANT	INDUSTRIAL	NO	UNNAMED TRIBUTARY TO TALLAPOOSA RV		03150108
ALG180524	MITCHELL AUTO&USED PARTS	INDUSTRIAL	NO	UT LOST CREEK, UT FARMERS CREEK		03150108
AL0053716	ROANOKE TREATMENT PLANT	MUNICIPAL	NO	UNNAMED TRIB HIGH PINE CREEK		03150108
ALG670057	SOUTHERN NATURAL GAS CO	INDUSTRIAL	NO	UT CAHULGA CK, CAHULGA CK, CANE CK, TALLAPOOSA RIVER		03150108
ALG120360	SOUTHWIRE FORTE POWER SYSTEMS	INDUSTRIAL	NO	UT LAKE CHARLES		03150108
AL0002810	TYSON FOODS INC HEFLIN	INDUSTRIAL	NO	TALLAPOOSA RIVER	0.001	03150108
ALG110018	WEBB CONCRETE INC	INDUSTRIAL	NO	UT TOWN CREEK		03150108
AL0024171	WEDOWEE LAGOON	MUNICIPAL	NO	WEDOWEE CREEK	0.15	03150108
ALG240063	WEHADKEE YARN ROCK MILLS	INDUSTRIAL	NO	WEHADKEE CREEK		03150108
ALG180345	WYSNER MOTORS	INDUSTRIAL	NO	UT CHULAFINNEE CREEK		03150108
ALG060380	3D WOODCRAFT INC	INDUSTRIAL	NO	UT FOX CREEK		03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG200023	ACE PRODUCTS INC	INDUSTRIAL	NO	UT CROOKED CREEK		03150109
AL0067695	ADAMS WATER TREATMENT PLANT	MUNICIPAL	NO	UT OF TALLAPOOSA RIVER MARTIN LAKE		03150109
ALG360017	ALABAMA POWER COMPANY - HARRIS HYDRO	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150109
ALG360014	ALABAMA POWER COMPANY - MARTIN DAM HYDRO	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150109
ALG060046	ALABAMA RIVER CHIP JACKSONS GP	INDUSTRIAL	NO	MANOY CREEK		03150109
AL0064661	AMOCO FABRICS AND FIBERS CO	INDUSTRIAL	NO	UT TOWN CREEK		03150109
AL0020141	ASHLAND WWTP	MUNICIPAL	YES	HORSETROUGH CREEK	1.07	03150109
ALG240028	AVONDALE MILLS-BEVELLE	INDUSTRIAL	NO	UT SUGAR CREEK		03150109
ALG180280	BAKER AUTOMOTIVE	INDUSTRIAL	NO	SOAPSTONE CREEK		03150109
ALG060329	BASELINE FORESTRY SERVICES	INDUSTRIAL	NO	UT CHATAHOSPEE CREEK		03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG110014	BROWN'S CONCRETE AND CONSTRUCTION	INDUSTRIAL	NO	UT CROOKED CREEK		03150109
AL0073784	CALPINE HILLABEE ENERGY CTR	INDUSTRIAL	NO	OAKTASASI CREEK		03150109
AL0024210	CAMP HILL WASTEWATER TRMT PLT	MUNICIPAL	NO	SANDY CREEK SOUTH FORK	0.15	03150109
AL0054551	CANDLEWICK YARNS	INDUSTRIAL	NO	UN TRIB TOWN CREEK	0.032	03150109
ALG140548	CHUCK'S MARINA INC	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALG120338	CLARK MACHINE SHOP	INDUSTRIAL	NO	HIGH PINE CREEK		03150109
AL0052680	CLAY COUNTY WATER TRMT PLANT	MUNICIPAL	NO	CROOKED CREEK		03150109
ALG060392	CMS HOLDINGS COMPANY	INDUSTRIAL	NO	GLADNEY MILL BRANCH		03150109
AL0021156	COLEY CREEK WWTP	MUNICIPAL	YES	COLEY CREEK MARTIN LAKE	1.95	03150109
ALG110188	CONCRETE COMPANY	INDUSTRIAL	NO	UT HAROLD CREEK		03150109
ALG110215	CONCRETE COMPANY - ROANOKE	INDUSTRIAL	NO	UT GLADNEY MILL BRANCH CREEK		03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG340352	CROWN CENTRAL PETRO CORP	INDUSTRIAL	NO			03150109
AL0063797	DADEVILLE WWTP	MUNICIPAL	NO	CHATTASOFKA CREEK	0.42	03150109
ALU930008	DANIEL OIL COMPANY INC	INDUSTRIAL	NO			03150109
ALG180436	DARNELLS JUNK YARD	INDUSTRIAL	NO	UT SANDY CREEK		03150109
ALG140623	DARWIN DOBBS CO. CUSTOM D	INDUSTRIAL	NO	SUGAR CREEK		03150109
ALG060269	DON GAY LUMBER CO	INDUSTRIAL	NO	UT HIGH PINE CREEK		03150109
AL0074098	DUKE ENERGY ALEXANDER CTY	INDUSTRIAL	NO	HILLABEE CREEK		03150109
ALG020098	DUNN CONST CO INC-ALEX CY	INDUSTRIAL	NO	UT BLACKMAN CREEK		03150109
AL0052230	EARL C. KNOWLTON WTP	MUNICIPAL	NO	HILLABEE CREEK		03150109
ALG060385	ECON CO-PINEYWOODS MULCH	INDUSTRIAL	NO	UT LAKE MARTIN		03150109
AL0053325	GOODWATER FILTER PLANT	MUNICIPAL	NO	UNNAMED TRIB WILDCAT CREEK		03150109
ALG140396	GRANGER OIL CO INC	INDUSTRIAL	NO	ELKAHATCHEE CREEK		03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0056448	HANSON AGGREGATES SOUTHEAST INCORPORATED	INDUSTRIAL	NO	UNNAMED TRIBUTARIES TO OAKACHOY CR		03150109
ALG140208	HARBOR POINT MARINA	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALH01136	HARRIS ROAD DEVELOPMENT	INDUSTRIAL	NO			03150109
ALG340104	HARRY L DANIEL JOBBER	INDUSTRIAL	NO	UT CHATTASOFKA CREEK		03150109
AL0052043	HILLABEE WATER TREATMENT PLANT	MUNICIPAL	NO	HILLABEE CREEK		03150109
ALG140312	HOLMAN'S ALEX CITY MVG	INDUSTRIAL	NO	GROUNDWATER		03150109
ALG110251	HUEY CONCRETE PRODUCTS CO	INDUSTRIAL	NO	TOWN CREEK		03150109
AL0053538	KOWALIGA RETREAT WWTP	MUNICIPAL	NO	TALLAPOOSA RIVER LAKE MARTIN	0.045	03150109
AL0062839	LAFAYETTE MILL CREEK WWTP	MUNICIPAL	YES	MILL CREEK	1	03150109
AL0053678	LAFAYETTE WTP	MUNICIPAL	NO	UNNAMED TRIBUTARY FINLEY CREEK		03150109
AL0050644	LINEVILLE LAGOON	MUNICIPAL	NO	UNNAMED TRIBUTARY TO CROOKED CREEK	0.5	03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG120289	MAYFIELD SALVAGE, INC.	INDUSTRIAL	NO	RADIO TOWER ROAD CREEK		03150109
ALG180022	MCGUIRE'S SALVAGE YARD	INDUSTRIAL	NO	TURKEY BRANCH		03150109
ALG180065	MIDWAY AUTO SALVAGE	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150109
ALG160137	NORTH CENTRAL AVE C&D LF	MUNICIPAL	NO	UT OAKTASASI CREEK		03150109
ALG120354	PLANTATION PATTERNS	INDUSTRIAL	NO	CARLISLE BRANCH		03150109
ALG140211	PLEASURE POINT PK& MARINA	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALG110360	RANDOLPH COUNTY CONCRETE COMPANY	INDUSTRIAL	NO	UT LAKE WEDOWEE		03150109
ALG160021	RANDOLPH COUNTY SANITARY LANDFILL	INDUSTRIAL	NO	UT WILDCAT CREEK		03150109
ALG140196	REAL ISLAND MARINA	INDUSTRIAL	NO	LAKE MARTIN		03150109
AL0062715	ROANOKE HCR LAGOON	MUNICIPAL	YES	HIGH PINE CREEK	1.3	03150109
ALG120197	ROBINSON FOUNDRY INC	INDUSTRIAL	NO	TRIB. ELKAHATCHEE CREEK		03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG140194	ROYSTER ENTERPRISES INC	INDUSTRIAL	NO	ENITACHOPCO CREEK		03150109
ALG240054	RUSSELL CORP ALEX CITY	INDUSTRIAL	NO	SUGAR CREEK		03150109
ALP960066	RUSSELL CORP ALEX CITY	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150109
ALG140751	RUSSELL LANDS - KOWALIGA MARINA	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALG140750	RUSSELL LANDS-RIDGE MARINA	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALG140752	RUSSELL LANDS-RIVER NORTH	INDUSTRIAL	NO	LAKE MARTIN		03150109
ALG120125	RUSSELL PIPE & FOUNDRY	INDUSTRIAL	NO	UT ELKAHATCHEE CREEK		03150109
ALG200045	SHAPE SOUTH, INC.	INDUSTRIAL	NO	BUCK CREEK		03150109
ALG110020	SHERMAN INDUSTRIES INC	INDUSTRIAL	NO	UT TALLAPOOSA RIVER		03150109
ALG140507	SKYLINE TRANSPORTATION	INDUSTRIAL	NO	UT SUGAR CREEK		03150109
ALG160080	SOLID WASTE DISPOSAL AUTHORITY	INDUSTRIAL	NO	TANYARD BRANCH		03150109
ALG120391	STEELFAB INC OF ALABAMA	INDUSTRIAL	NO	UT GLADNEY MILL BRANCH CREEK		03150109

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NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0047601	STILLWATERS RESORT SPRAYFIELD	INDUSTRIAL	NO	GROUNDWATER	0.09	03150109
ALG020134	STRAIN ASPHALT AND PAVING	INDUSTRIAL	NO	UT GLADNEY MILL BRANCH CREEK		03150109
AL0048861	SUGAR CK WWTP	MUNICIPAL	YES	TALLAPOOSA R MARTIN LK AND SUGAR CK	8.5	03150109
ALG140373	T C RUSSELL AIRPORT	INDUSTRIAL	NO	SUGAR CREEK		03150109
ALG670007	TRANS GAS PIPELINE CORP-WADLEY	INDUSTRIAL	NO	BEAVER DAM CREEK		03150109
ALG670165	TRANSCO-M0MENTUM KELLYTON	INDUSTRIAL	NO	HILLABEE CREEK		03150109
ALG70007	TRANSCONTINENTAL GAS PL CORP	INDUSTRIAL	NO	BEAVER DAM CREEK		03150109
ALG060300	TRU-WOOD CABINETS INC	INDUSTRIAL	NO	UT ENITACHOPCO CREEK		03150109
ALG150033	TYSON FOODS INC - ASHLAND	INDUSTRIAL	NO	HORSETROUGH CREEK		03150109
ALG140636	URRUTIA INC	INDUSTRIAL	NO	UT ELKAHATCHEE CREEK		03150109
AL0062847	WADLEY LAGOON	MUNICIPAL	NO	TALLAPOOSA RIVER	0.15	03150109

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG060395	WELL MADE INC	INDUSTRIAL	NO	UT CROOKED CREEK/ JETER BRANCH FOX CREEK		03150109
ALG060004	WELLBORN CABINETS INC	INDUSTRIAL	NO	UT METCALF CREEK		03150109
ALG060187	WELLBORN FOREST PRDTS	INDUSTRIAL	NO	TRIB. SUGAR CREEK		03150109
ALG180272	WILLIES CYCLE, INC.	INDUSTRIAL	NO	GROUNDWATER AND UPPER TALLAPOOSA		03150109
AL0029424	WIND CREEK STATE PARK LAGOON	MUNICIPAL	NO	TALLAPOOSA RIVER LAKE MARTIN	0.1	03150109
ALHA01127	84 LUMBER COMPANY MONTGOMERY	INDUSTRIAL	NO			03150110
AL0051403	AL DCOR RED EAGLE HONOR FARM L	MUNICIPAL	NO	TALLAPOOSA RIVER	0.025	03150110
ALG670133	ALABAMA GAS-PINE LEVEL #2	INDUSTRIAL	NO	UT MIDDLE CREEK		03150110
ALG360013	ALABAMA POWER COMPANY-THURLOW HYDRO	INDUSTRIAL	NO			03150110
AL0050181	ALABAMA SHERIFF GIRLS RANCH	MUNICIPAL	NO	WIND CREEK	0.012	03150110

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NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0073024	ANDERSON ROAD MATERIALS LLC	INDUSTRIAL	NO	UT TO TALLAPOOSA RIVER GROUNDWATER		03150110
ALG020015	APAC ALABAMA INC	INDUSTRIAL	NO	UT CHEWACLA		03150110
ALG020041	APAC ALABAMA INCORPORATED MONTGOMERY	INDUSTRIAL	NO	UT TALLAPOOSA RIVER		03150110
ALG020002	APAC INCORPORATED	INDUSTRIAL	NO	UT HOGANS CREEK		03150110
ALG360010	APCO YATES HYDRO	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
ALG140468	AU OPELIKA AP	INDUSTRIAL	NO	UT MOORE'S MILL CREEK		03150110
ALG140369	AVERITT EXPRESS INC	INDUSTRIAL	NO	JENKINS CREEK		03150110
AL0050016	BAMA RAILCAR	INDUSTRIAL	NO	CUBAHATCHEE CREEK	0.01	03150110
ALG060322	BAMA WOOD INC-KELLYTON	INDUSTRIAL	NO	OAKTASASI CREEK		03150110
AL0043656	BEAUREGARD HIGH SCHOOL LAGOON	MUNICIPAL	NO	UT TO CHEWACLA CREEK	0.018	03150110
ALG340098	BLACKBURN OIL COMPANY INC	INDUSTRIAL	NO	UT SOUGAHATCHEE CREEK		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG120330	BRIGGS & STRATTON CORP	INDUSTRIAL	NO	UT PARKERSON MILL AND PARKERSON MILL		03150110
ALG110274	BUILDERS SUPPLY EAST PLANT	INDUSTRIAL	NO	JENKINS CREEK		03150110
ALG120339	C AND D SCRAP	INDUSTRIAL	NO	UT BURT MILL CREEK		03150110
AL0065731	C T PERRY WTP	MUNICIPAL	NO	TALLAPOOSA RIVER		03150110
ALG060161	CAPITAL VENEER WORKS	INDUSTRIAL	NO	UT CONLEY CREEK		03150110
ALG110026	CASTONE CORPORATION	INDUSTRIAL	NO	UT CHEWACLA		03150110
AL0071315	CENTRAL ELMORE WATER AUTHORITY	MUNICIPAL	NO	UNNAMED TRIB TO MARTIN LAKE		03150110
ALG250028	CHAR-BROIL A DIV OF WC BRADLEY	INDUSTRIAL	NO	PEPPERMILL BRANCH CREEK		03150110
ALG340383	CITY OF OPELIKA-PUBLIC WORKS	MUNICIPAL	NO	EAST CREEK		03150110
ALL045641	COLONY APARTMENTS	MUNICIPAL	NO			03150110
AL0045641	COLONY CONDOMINIUMS WWTP	MUNICIPAL	NO	UT TO SAUGAHATCHEE CREEK	0.02	03150110
ALG110019	CONCRETE COMPANY	INDUSTRIAL	NO	UT SEVEN MILE CREEK		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG110276	CONCRETE COMPANY	INDUSTRIAL	NO	HOGANS CREEK		03150110
ALG110308	CONCRETE COMPANY INC	INDUSTRIAL	NO	UT CHEWACLA CREEK		03150110
AL0064955	CONWAY ACRES TRAILER PK LAGOON	MUNICIPAL	NO	CHOCTAFAULA CREEK	0.037	03150110
AL0073644	COOSADA READY MIX USA	INDUSTRIAL	NO	UT SEVEN MILE CREEK		03150110
ALG110362	COUCH READY MIX USA	INDUSTRIAL	NO	UT ROBINSON CREEK		03150110
ALG140721	D&J ENTERPRISES	INDUSTRIAL	NO	UT CHOCTAFAULA CREEK		03150110
ALP900155	DIVERSIFIED PRODUCTS TUBE	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
ALP890054	DP TUBE MILL	INDUSTRIAL	NO			03150110
ALP890055	DP WILLIAMSON AVE	INDUSTRIAL	NO			03150110
ALG020101	EAST ALABAMA PAVING COMPANY INC	INDUSTRIAL	NO	UT CHEWACLA		03150110
AL0067903	ECLECTIC LAGOON & SPRAYFIELD	MUNICIPAL	NO	GROUNDWATER		03150110
ALG150049	FLOWERS BAKING CO.	INDUSTRIAL	NO	PEPPERELL BRANCH		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG180098	FOREIGN AUTO SALVAGE	INDUSTRIAL	NO	GALBRAITH MILL CREEK		03150110
ALG140393	FULLER WAREHOUSE & GIN	INDUSTRIAL	NO	UT HANEY CREEK		03150110
ALG120331	GKN WESTLAND AEROSPACE	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
AL0050237	H C MORGAN WPCF	MUNICIPAL	YES	PARKERSON MILL CREEK	9	03150110
ALG180256	HEART OF DIXIE AUTO PARTS	INDUSTRIAL	NO	GROUNDWATER AND/OR UT		03150110
AL0052981	HOLTVILLE FILTER PLANT	MUNICIPAL	NO	UNNAMED TRIB MORTAR CREEK		03150110
ALG180489	J & M AUTO SALVAGE	INDUSTRIAL	NO	STONE CREEK		03150110
ALG340342	JET PEP #48	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
ALG110142	KIRKPATRICK CONCRETE INC.	INDUSTRIAL	NO	UT HOGAN'S CREEK		03150110
ALG110040	LAFARGE/AUBURN READY MIX	INDUSTRIAL	NO	UT SOUGAHATCHEE CREEK		03150110
ALG140406	LAMBERT TRF & STORAGE	INDUSTRIAL	NO	UT SOUGAHATCHEE CREEK		03150110
ALG240074	LESHNER CORPORATION	INDUSTRIAL	NO	UT SOUGAHATCHEE CREEK		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0068454	LINE CREEK	INDUSTRIAL	NO	LINE CK GROUNDWATER UT TO LINE CK		03150110
AL0043672	LOACHAPOKA HIGH SCHOOL LAGOON	MUNICIPAL	NO	UT TO CHOCLAFAULA CREEK	0.137	03150110
ALG140481	M & M TRUCKING CO, INC	INDUSTRIAL	NO	PARKERSON MILL CREEK		03150110
AL0049841	MACON COUNTY GREYHOUND PK INC	INDUSTRIAL	NO	GROUNDWATER	0.04	03150110
ALG060355	MASTERBRAND CABINETS, INC	INDUSTRIAL	NO	UT PARKERSON MILL CREEK		03150110
ALG200056	MICHELIN N A UNIROYGAL GOODRICH TIRE MANUGACTURING DIVISION	INDUSTRIAL	NO	CHEWACLA CREEK & LITTLE UCHEE CREEK		03150110
ALG240039	MOUNT VERNON MILLS	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
AL0047236	MT NEBO WASTEWATER TRMT PLANT	MUNICIPAL	NO	PERSIMMON CREEK	0.027	03150110
ALG120404	NEPTUNE TECH GROUP INC	INDUSTRIAL	NO	LEWIS CREEK/ WALLAHATCHEE CREEK		03150110
AL0050245	NORTHSIDE WPCF	MUNICIPAL	YES	SOUGAHATCHEE CREEK	1.6	03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG340227	NOTASULGA FINA	INDUSTRIAL	NO	UT RED CREEK		03150110
AL0070939	NOTASULGA LAGOON & SPRAYFIELD	MUNICIPAL	NO	GROUNDWATER	0.085	03150110
AL0050130	OPELIKA CITY WASTEWATER WESTSIDE TREATMENT FACILITY	MUNICIPAL	YES	SAUGAHATCHEE CREEK	4	03150110
ALG120124	OPELIKA FOUNDRY COMPANY	INDUSTRIAL	NO	HALAWAKEE CREEK SAUGAHATCHEE CREEK		03150110
ALG340385	PETRO STATION #242	INDUSTRIAL	NO	TUSKEGEE CITY LAKE		03150110
AL0065757	PETRO STOPPING CENTERS WWTP	MUNICIPAL	NO	CUBAHATCHEE CREEK	0.006	03150110
ALG120026	PROGRESS RAIL SERVICES	INDUSTRIAL	NO	TALLAPOOSA RIVER		03150110
AL0003310	QUANTEGY INC	INDUSTRIAL	NO	TRIB TO PEPPERELL BRANK	0.29	03150110
AL0074314	RAILWORKS WOOD WASTE	INDUSTRIAL	NO	MILLER CREEK		03150110
ALG140435	RENTAL SERVICE COMPANY	INDUSTRIAL	NO	GROUNDWATER		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG120071	ROBERT BOSCH TOOL CORPORATION	INDUSTRIAL	NO	UT PARKERSON MILL CREEK		03150110
ALG110262	SHERMAN INDUSTRIES INC	INDUSTRIAL	NO	UT LAKE MARTIN		03150110
ALG110006	SHERMAN INTERNATIONAL CENTRAL AL DIV	INDUSTRIAL	NO	UT HOGANS CREEK		03150110
ALG120051	SIMCALA INC	INDUSTRIAL	NO	MILLER CREEK		03150110
ALG340345	SISTRUNK GROCERY	INDUSTRIAL	NO	BIG CREEK		03150110
ALG120016	SMC SOUTH	INDUSTRIAL	NO	UT CHOCTAFAULA CREEK		03150110
AL0051896	SOUTH MACON HIGH SCHOOL	MUNICIPAL	NO	CALEBEE CREEK	0.018	03150110
ALG670027	SOUTHERN NATURAL GAS CO	INDUSTRIAL	NO	BRUSH/SNAKE/WATULA/FLAKE/MILL/NAS		03150110
ALG670064	SOUTHERN NATURAL GAS CO	INDUSTRIAL	NO	COOSA R, TALLAPOOSA R, WALLAHATCHEE CK		03150110
ALG120477	STAHLSCHMIDT AND MAIWORM	INDUSTRIAL	NO	UT AND PARKERSON MILL CREEK		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0058777	STATE OF AL DEPARTMENT OF YOUTH SERVICES	MUNICIPAL	NO	U T TO BUTLER CREEK	0.06	03150110
ALG160161	SUNFLOWER E.A.T.S., LLC	INDUSTRIAL	NO	UT SOUGAHATCHEE CREEK		03150110
AL0053082	TALLASSEE FILTER PLANT CITY OF	MUNICIPAL	NO	TALLAPOOSA RIVER	0.18	03150110
AL0020486	TALLASSEE SEWER STABILIZATION	MUNICIPAL	YES	TALLAPOOSA RIVER	1.4	03150110
ALG160159	TALLASSEE WASTE DISPOSAL	INDUSTRIAL	NO	UT GLEEDEN BRANCH		03150110
ALG340132	TAYLOR PETROLEUM INC.	INDUSTRIAL	NO	CHANNAHATCHEE CREEK		03150110
ALG110174	THE CONCRETE CO.-TALLASSE	INDUSTRIAL	NO	WALLAHATCHEE CREEK		03150110
ALG120171	THE FALK CORPORATION	INDUSTRIAL	NO	PARKERSON MILL CK AND WEBSTERS POND		03150110
AL0059242	THREE SPRINGS SCHOOL LAGOON	MUNICIPAL	NO	U T TO LITTLE PERSIMMON CREEK	0.015	03150110
AL0048763	TUSKEGEE NORTH WATER POLLUTION	MUNICIPAL	YES	TALLAPOOSA RIVER	2	03150110
ALG110143	TUSKEGEE READY MIX-TUSKEG	INDUSTRIAL	NO	UT CALEBEE CREEK		03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
AL0025984	TUSKEGEE SOUTH WWTP	MUNICIPAL	YES	CALEBEE CREEK		03150110
AL0052124	TUSKEGEE WATER TREATMENT PLANT	MUNICIPAL	NO	UT TALLAPOOSA RIVER		03150110
ALG110222	TWIN CITY CONCRETE AUBURN	INDUSTRIAL	NO	UT MOORE'S MILL CREEK		03150110
AL0060445	UNION SPRINGS WWTP AND LAND AP	MUNICIPAL	YES	GROUNDWATER	1.5	03150110
ALG140019	W S NEWELL INC	INDUSTRIAL	NO	JENKINS CREEK		03150110
ALG180167	WAGNON AUTO PARTS INC	INDUSTRIAL	NO	UT SEVEN MILE CREEK		03150110
AL0068632	WARD PROPERTY	INDUSTRIAL	NO	UT TO CALEBEE CREEK		03150110
ALG180159	WASTE RECYCLING-OPELIKA	INDUSTRIAL	NO	PEPPERELL CREEK		03150110
AL0001074	WESTPOINT STEVENS GRIFFTEX CHEMICALS	INDUSTRIAL	NO	PEPPERELL BRANCH	0.0078	03150110
AL0002968	WESTPOINT-OPELIKA MILL	INDUSTRIAL	YES	PEPPERELL BRANCH	1.85	03150110

EXHIIBIT H-1
NPDES Permits
Tallapoosa River Basin Management Plan

Permit Number	Facility	Facility Type	Major Discharger	Receiving Waters	Flow (mgd)	8-Digit HUC
ALG340326	WILLIAMS EXPRESS INC 2139	INDUSTRIAL	NO	SOUGAHATCHEE CREEK		03150110
ALG340030	WILSON OIL COMPANY INC	INDUSTRIAL	NO	PARKERSON MILL CREEK		03150110

Notes:
mgd = million gallons per day
HUC = hydrologic unit code

EXHIBIT H-2
Sand and Gravel Mines/Rock Quarries
Tallapoosa River Basin Management Plan

Permit Number	Facility	Receiving Waters	8-digit HUC
ALR320688	JACK KITCHEN BORROW PIT		03150108
AL0075191	WEDOWEE QUARRY INCORPORATION		03150108
ALR320678	ALEX CITY PIT NUMBER 1		03150109
ALR320679	ALEX CITY PIT NUMBER 2		03150109
ALR320681	ALEX CITY PIT NUMBER 4		03150109
ALR320637	GRANGER ROY JIMMY SANFORD PIT		03150109
ALR101510	HIGHWAY 22 BORROW PIT SITE	UT HILLABEE CREEK	03150109
AL0067334	LARRY SCROGGINS PIT	UT TO THE TALLAPOOSA RV LAKE MARTIN	03150109
AL0067172	MORAN PIT	TALLAPOOSA RIVER	03150109
ALR320636	PINEY WOODS PIT		03150109
ALR320446	SAXON BORROW PIT	MATTOX BRANCH	03150109
AL0002640	AUBURN QUARRY	CHEWACLA CK LK OGLETREE IMPOUNDMENT	03150110
AL0069850	CITY PIT	UT TO OLIVER CK UT TO TALLAPOOSA RV	03150110
AL0061468	DUBOSE PIT 1	UT TO MILLER CK MILLER CREEK GW	03150110
AL0070637	GRAHAM MATTHEWS WAUGH PIT	UT TO LINE CREEK GROUNDWATER	03150110
ALR320754	HALL PIT		03150110
ALR105799	HANCOCK PIT		03150110
ALR320613	HOWARD GRIGGS PIT NUMBER 1		03150110
ALR320614	HOWARD GRIGGS PIT NUMBER 2		03150110
ALR105745	MCLEMORE PIT ATLANTA HIGHWAY		03150110

EXHIBIT H-2
Sand and Gravel Mines/Rock Quarries
Tallapoosa River Basin Management Plan

Permit Number	Facility	Receiving Waters	8-digit HUC
AL0070122	OPELIKA QUARRY	UT OF CHEWACLA CK UT LITTLE UCHEE C	03150110
AL0062405	PINKSTON PIT	UT TO TALLAPOOSA RV CUBAHATCHEE CK	03150110
AL0057207	WAUGH PIT	GROUNDWATER LINE CR TANK BRANCH	03150110
AL0074136	WAUGH PIT NO 2	UT LINE CREEK GROUNDWATER	03150110
AL0074357	WEST LEE COUNTY QUARRY	UT TO SOUGAHATCHEE CREEK	03150110

Note:
HUC = hydrologic unit code

EXHIBIT H-3
Registered CAFOs in the Tallapoosa River Basin
Tallapoosa River Basin Management Plan

Registration No.	Facility	Primary Animal Type	Near Surface Stream	8-Digit HUC
A000208	BEAR RIVER FARMS	POULTRY - BROILER	TALLAPOOSA RIVER	03150108
A000239	BILLY FRED LIPHAM FARMS	POULTRY - BROILER	COHOBADIAH CREEK	03150108
A000211	BLUE RIDGE, HAYWOOD, BIRD EGG FARMS	POULTRY LAYER DRY	CHULAFINNEE CREEK	03150108
A000209	CDL FARMS/GO FOR BROKE FARMS	POULTRY LAYER DRY	TALLAPOOSA RIVER	03150108
A000410	COCKADOODLE/FEATHER FARM	POULTRY - BROILER	CANE CREEK	03150108
A000213	CROSSON FARM	POULTRY - BROILER	UT UPPER TALLAPOOSA RIVER	03150108
A000242	H. G. MILES FARMS	POULTRY - BROILER	LITTLE TALLAPOOSA	03150108
A000240	HOMESTEAD FARM	POULTRY - BROILER	CANE CREEK	03150108
A000212	JACKSON POULTRY	POULTRY - BROILER	LOST CREEK	03150108
A000238	JASON SIMPSON FARMS	POULTRY - BROILER	LITTLE TALLAPOOSA RIVER	03150108
A000237	LITTLE RIVER FARMS, INC.	POULTRY - BROILER	LITTLE TALLAPOOSA RIVER	03150108
A000243	PHILLIPS POULTRY FARM	POULTRY - BROILER	LITTLE KETCHEPEDRAKEE CREEK	03150108
A000210	RED COMB FARM	POULTRY LAYER DRY	FARMER CREEK	03150108
A000241	SHELTON POULTRY FARM	POULTRY - BROILER	TALLAPOOSA RIVER	03150108

Notes:
CAFO = concentrated animal feed operation
HUC = hydrologic unit code

APPENDIX I

Abbreviated Final 2002 §303(d) List for Alabama

EXHIBIT I-1
Final 2002 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

WaterbodyID	Waterbody Name	Support Status	Type of Water	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL/03150108-250_01	Wolf Creek	Partial	R	M	Tallapoosa	Randolph	Fish & Wildlife	Pathogens	Int. animal feeding oper.	1990	4.0 miles	L. Tallapoosa River / Its Source	Yes	2002
AL/03150109-190_01	Sugar Creek	Non	R	H	Tallapoosa	Tallapoosa	Fish & Wildlife	Metals (Cu) Chlorides Nutrients Color	Municipal	1990-96	4.8 miles	Elkahatchee Creek / Sugar Cr Alex City	No	2004
AL/Yates Res_01	Yates Reservoir (Sougahatchee Creek Embayment)	Non	L	H	Tallapoosa	Tallapoosa	Public Water Supply Swimming Fish & Wildlife	Nutrients OE/DO	Industrial Municipal Nonirrigated crop prod. Pasture grazing	1994-97	224 acres	Soug. Cr. Embayment / NW1/4, S 21, T19N, R22E	Yes	2003
AL/03150110-030_01	Pepperell Branch	Non	R	H	Tallapoosa	Lee	Fish & Wildlife	Nutrients	Industrial	1988	6.5 miles	Sougahatchee Creek /	Yes	2003

EXHIBIT I-1
Final 2002 §303(d) List for Alabama
Tallapoosa River Basin Management Plan

WaterbodyID	Waterbody Name	Support Status	Type of Water	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
												Its Source		
AL/03150110-100_01	Calebee Creek	Non	R	H	Tallapoosa	Macon	Fish & Wildlife	Siltation	Surface mining	1996	10 miles	Tallapoosa River /	No	2002
								Other habitat alteration	Agriculture			Macon Co. Rd. 9		
AL/03150110-120_01	Cubahatchee Creek	Non	R	H	Tallapoosa	Macon	Swimming	Siltation	Surface mining	1996	41 miles	Tallapoosa River /	No	2002
							Fish & Wildlife	Other habitat alteration	Agriculture			Its Source		
AL/03150110-140_01	Line Creek	Partial	R	M	Tallapoosa	Macon	Fish & Wildlife	Siltation	Surface mining	1996	10.0 miles	Tallapoosa River /	No	2002
								Other habitat alteration	Agriculture			Johnsons Creek		
AL/03150110-140_02	Line Creek	Partial	R	M	Tallapoosa	Macon	Fish & Wildlife	Siltation	Surface mining	1996	5.1 miles	Johnsons Creek /	No	2002
									Agriculture			Panther Creek		
AL/03150110-050_01	Moores Mill Creek	Non	R	L	Tallapoosa	Lee	Fish & Wildlife	Siltation	Land development	1998	10.1 miles	Chewacla Creek/	No	2002
							Swimming		Urban runoff/ Storm sewers			Its Source		

Notes:
OE/DO = organic enrichment/dissolved oxygen
Source: ADEM Website (http://www.adem.state.al.us/WaterDivision/WQuality/303d/WQ303d.htm)