UPPER COOSA BASIN

WATERSHED MANAGEMENT PLAN

JULY 2004

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Acknowledgements

This publication was funded by the U.S. Environmental Protection Agency and the Alabama Department of Environmental Management.

Special thanks are extended to the following people for their help in developing the Upper Coosa River Basin Management Plan: Carolyn Turner, Upper Coosa Watershed Project; Philip Abney, NRCS; Mike Jones, ADEM; David Thompson, ADEM; Norm Blakey, ADEM; Dr. Miriam Hill, JSU; and all the members of the Watershed Citizen Advisory Committee who volunteered their time towards this project.

Cover photo courtesy of Friends of Rural Alabama.

PREFACE

Water is a shared natural resource and all watershed stakeholders should be engaged in its protection and management. This river basin management plan, hereinafter referred to as the "Management Plan" or "Plan" addresses the Upper Coosa River section of the Coosa River Basin. It is the "property" of the citizens in the Upper Coosa River Basin. It was locally developed and will be locally driven. It promotes local "grass-roots" involvement – not an agency command and control or a "top-down" management approach. Agencies should share plan development, implementation leadership, and vision – but not plan ownership. Resource agencies, regulatory entities, and the private sector are all engaged as equal partners.

Development and implementation of this Plan will be an ongoing process, i.e., revisions are expected to be made as new data and information becomes available, management measures are successfully implemented and maintained, water quality improves, or as stakeholder priorities change. The Plan is designed to provide common sense, environmentally protective and economically achievable strategies to address water quality using a basin wide management approach. Although water quality and water quantity issues are often intertwined, this Plan does not address water quantity or use issues. However, future addenda to this Plan are expected as citizen interest, new data and information, and voluntary and regulatory issues evolve.

Pollution prevention is a priority consideration. While much emphasis is placed on restoring impaired waters, this Plan does recognize the need to protect waters that are not impaired and assure that they remain unimpaired. Management strategies and action items are intended to provide long-term solutions to impaired and threatened surface and ground water quality.

Achieving the goal of this Plan is a long-term endeavor. A primary consideration is to resolve problems by correctly diagnosing problems and clearly identifying management strategies and endpoints. Feasible alternatives and innovative solutions, based upon upstream-downstream, cause-effect, and cost-benefit relationships, will also be considered before management practices are implemented.

Partnerships are encouraged in order to coordinate efforts, share information, and plan more effectively for protection and preservation. The Plan recognizes the significant role that local watershed protection partnerships can play and acknowledges that environmental problems are often best resolved at the local level. This Plan strongly promotes citizen groups, public and nonprofit organizations, watershed protection groups, industry and corporations, businesses, civic groups, teachers and students, landowners and users, and Federal, State and local government agency cooperation. Stakeholder collaboration is essential to address a multitude of complex and inter-related issues. Communication about management strategies is especially important for generating enthusiasm and participation and for preventing confusion. Maintaining long-term citizen interest and support are key to successful implementation and human and financial capital to implement this plan may be limited. Therefore, partners are encouraged to contribute human and financial assistance, technical expertise, and other in-kind services.

This Plan provides strategies to resolve "big-picture" water quality problems across a wide physio-geographic area. It may also be used as a foundation to develop or strengthen other water quality protection approaches, TMDL implementation plans, or other watershed based management plans. It does not replace community-based environmental protection activities, but instead, compliments them because those efforts generally incorporate significant public

interest, address local concerns and issues, encourage local citizen hands-on involvement, and typically involve site-specific technical assistance and oversight.

This Plan promotes science-based targeting of management measures and monitoring. Management strategies presented in this Plan emerged as a collaborative effort and attempt to accommodate all affected interests, issues and opportunities represented in the Upper Coosa River Basin. In general, the science and technology, technical know-how, and broad-based public support already exist to implement the management measures presented in this Management Plan. However, it is acknowledged that a one-size-fits-all solution cannot effectively address a multitude of complex basin-wide issues presented herein. Efforts will be made to consistently engage all stakeholders, as equal partners, in decision-making processes. In addition, since some stakeholder interest and priorities may change over time, and funding to implement “ideal” solutions will be limited, basin management adaptations are expected. Revisions and course corrections will be accomplished with ample public input.

The strategies presented in Section IV focus on achieving cleaner water by strengthening public health protections, promoting the watershed protection approach, identifying stakeholder roles and responsibilities and partnering opportunities, and identifying potential resources to manage pollutants and enhance natural resource stewardship. This Plan can serve as a catalyst for long-term stakeholder interest and participation. It promotes natural resource protection stewardship, and may serve as a stimulus to evaluate management measure effectiveness, progress and success. In addition, citizen volunteer monitoring and assessments and public education and outreach are essential components of this Plan and may be the most effective management practices.

ACRONYMS AND ABBREVIATIONS

A&I	Agriculture and Industry (water supply use classifications)
ACES	Alabama Cooperative Extension System
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADE	Alabama Department of Education
ADECA	Alabama Department of Economic and Community Affairs
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ADOT	Alabama Department of Transportation
ADPH	Alabama Department of Public Health
AEC	Alabama Environment Council
AEMC	Alabama Environment Management Commission
AEPA	Alabama Egg and Poultry Association
AFA	Alabama Forestry Association
AFC	Alabama Forestry Commission
AFO	Animal Feeding Operation
AGCA	Associated General Contractors of Alabama
AHBA	Alabama Home Builders Association
ALFA	Alabama Farmers Federation
ANHP	Alabama Natural Heritage Program
APC	Alabama Power Company
APPC	Alabama Pulp and Paper council
ARA	Alabama Rivers Alliance
ARS	Agricultural Research Service
ASG	Alabama Sea Grant Extension Program
ASMC	Alabama Surface Mining Commission
ASSESS	ADEM Strategy for Sampling Environmental Indicators of Surface Water Quality Status
ASWCC	Alabama Soil and Water Conservation Committee
ASWCD	Alabama Soil and Water Conservation Districts
AWF	Alabama Wildlife Federation
AWPCA	Alabama Water Pollution Control Act
AWRI	Alabama Water Resources Institute
AWW	Alabama Water Watch
AWWA	Alabama Water Watch Association
BCA	Business Council of Alabama
BMP	Best Management Practices
BSA/GSA	Boy and / or Girl Scouts of America
CAC	Citizen Advisory Committee
CAFO	Confined Animal Feeding Operation
CAWV	Certified Animal Waste Vendor
CBEP	Community Based Environmental Protection
CERS	Center for Environmental Research and Service – Troy State University
CLP	Clean Lakes Program
Co-Ag (AU)	College of Agriculture – Auburn University
COE	United States Army Corps of Engineers
CPESC	Certified Professional in Erosion and Sediment Control
CRBI	Coosa River Basin Initiative
CRP	Conservation Reserve Program
CSGWPP	Comprehensive State Groundwater Protection Plan
CVA	Clean Vessel Act

CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWP	Clean Water Partnership
DO	Dissolved Oxygen
DC	District Conservationist
EMAP	Environmental Monitoring Assessment Program
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
EWP	Emergency Watershed Protection Program
FAWN	Forestry Awareness Week Now
F&W	Fish and Wildlife (water supply use classification)
FIP	Forestry Incentives Program
FSA	Farm Services Agency
FWPCA	Federal Water Pollution Control Act
GIS	Geographical Information System
GPS	Global Positioning System
GSA	Geological Survey of Alabama
HBAA	Home Builders Association of Alabama
HOBOS	Homeowners and Boat Owners Association
HUC	Hydrologic Unit Code
ICFAA	International Center for Fisheries and Allied Aquaculture – Auburn University
IECA	International Erosion Control Association
IPM	Integrated Pest Management
MERC – AU	Marine Extension and Research Center – Auburn University
MOA	Memorandum of Agreement
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory of the USFWS
OAW	Outstanding Alabama Water (water use classification)
ONRW	Outstanding National Resource Water (water use classifications)
OSDS	Onsite Sewage Disposal System
OSM	United States Bureau of Mines – Office of Surface Mining
PALS	People Against A Littered State
PS	Point Source
PWS	Public Water Supply (water use classification)
QAC	Quality Assurance / Control
RC&D	Resource Conservation and Development
RD	Rural Development
RWC	Receiving Water Concentration
S	Swimming and Other Whole Body Water Contact Sports (water use classification)
SH	Shellfish Harvesting (water use classification)
SMZ	Streamside Management Zone
SOP	Standard Operating Procedures
SRF	State Revolving Fund of Alabama
SWCC	Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
SWCS	Soil and Water Conservation Society

SWCP	State Wetland Conservation Plan
SWCS	Soil and Water Conservation Society
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy of Alabama
TSI	Trophic State Index
TVA	Tennessee Valley Authority
USACE	U.S. Army Corps of Engineers (a.k.a. COE)
USDA	United States Department of Agriculture
USDA-FS	United States Department of Agriculture – Forest Service
USDA-NRCS	Natural Resources Conservation Service
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service (Department of the Interior)
USGS	United States Geological Survey
UWA	University of West Alabama
WBNEC	Weeks Bay National Estuarine Center
WCAMI	Wetlands Conservation and Management Initiative
WHIP	Wildlife Habitat incentives Program
WMA	Watershed Management Authorities
WRP	Wetlands Reserve Program
WQ	Water Quality
WWTP	Waste Water Treatment Plant

I. INTRODUCTION

This Plan is designed to serve as a river basin management program road map. It provides a long-term goal and details several objectives and strategies to achieve its goal. It will assist basin stakeholders in measuring how far they have come in achieving natural resources protection and recognizing where management strategies should be adjusted in order to achieve better results. In addition, it will help to ensure that human and financial capital is used efficiently and effectively by providing a foundation on which stakeholders focus limited resources on priority issues.

The scope and scale of this Plan is broad-based. It does not provide a one-size-fits-all or cookie-cutter prescription to address small watershed or site-specific needs. The river basin is constantly changing. Therefore, some strategies presented herein may not be valid over time, other problems may arise, or new ideas and perspectives may be provided. This Plan attempts to identify critical concerns of Upper Coosa River stakeholders and the local capacity, including resources, for addressing them at this point in time. It provides processes for bringing together basin partners to express both their understanding of the basin and their hopes and dreams for it. This Plan recognizes significant variations in basin-wide land and water resources and uses, and local community needs and wants. Local people best address solutions to local problems. Therefore, development and implementation of smaller subwatershed or TMDL implementation plans are encouraged to meet the needs of more localized community-based concern.

This Plan supports a holistic, basin-wide management approach to achieve the goal and objectives identified by Upper Coosa River stakeholders. Primary incentives for committing to a river basin management approach are opportunities to holistically and cost-effectively protect and restore water quality. Collaborative processes to implement effective best management practices (BMPs), promote citizen education and outreach, and significant emphases on public participation in decision-making processes is supported. This Management Plan does not pre-empt local subwatershed protection plans or decisions. However, it does attempt to assist local partnerships in deciding if it is in their best interest to implement them.

Developing and nurturing private and public partnerships is essential to the success of this basin Management Plan. Resource agencies need to coordinate between each other and integrate local citizen input into decision-making. Stakeholder comments are highly encouraged and sought after to assure that citizens and groups that have historically been left out of decisions have an opportunity to contribute to the planning and implementation process. Variability in stakeholder priorities and resource availability in each subwatershed or impaired water body must be recognized and valued. Partnerships should target impairments through consensus, while proactively preventing potential problems.

Monitoring programs must be adequately designed and sufficiently funded in order to determine if goals and objectives are being achieved. Data are essential to gauge progress and to ascertain the effects of management measure implementation. An adequately funded, cooperative, basin-wide monitoring program is needed to comprehend the cumulative impacts associated with land use changes and water uses. Some water quality monitoring data is available for the Upper Coosa River mainstem, reservoirs, and tributaries. However, additional information is needed for a complete understanding of the river basin. Data collection efforts should target the gathering of the right kind of data to provide sufficient information to make informed management decisions. The use or surveys, cost-effective monitoring techniques, modeling, and other research tools should be investigated and established. Creative monitoring

and assessment techniques should be explored and implemented where reasonable and defensible. A strong citizen volunteer water quality-monitoring program is highly encouraged.

Education is an important tool to inform and motivate, therefore, an extensive basin-wide citizen education and outreach program that includes all sectors of society – from legislators to elementary school students – must be pursued. Marketing of the management program, pilot projects, certifications, media campaigns, publications, and workshops are key components to raise citizen awareness and prompt participation. Identifying adequate and dedicated sources of human and funding capital will assure long-term success. Technical assistance, technology transfer, and financial incentive packages should be explored. Legislation may need to be developed and existing laws and regulations adequately enforced when the voluntary approach does not appear to be working.

The objectives and strategies included in this Plan are based on water quality data, land use/land cover information, input from Upper Coosa stakeholders, and other basin resource inventory. Sources of raw data and technical analyses are presented in the Works Cited and Supplemental Documents section. Additional quality assured information and data is welcomed by the CAC and may be included in this Plan as it becomes available, and/or as future basin management decisions are made. Therefore, frequent communication and participation with the CWP and the CAC is encouraged.

The general approach used to develop and format this document was derived from the *Middle Coosa River Basin Watershed Management Plan* (Aug. 2003). A significant portion of the Objectives and Strategies were taken from previous Weiss Lake management plans. These plans include the *Weiss 2000 Initiative* developed by the Cherokee County Chamber of Commerce, the *Weiss Lake Resource Management and Protection Plan*, by the East Alabama Regional Planning and Development Commission and the Draft *Upper Coosa River and Weiss Lake Watershed Protection Plan*, by CH2MHill. Additional sources of information used in this basin Plan are listed in the Works Cited and Supplemental Documents section.

A. River Basin Management Plan Goal and Objectives

The goal of the Upper Coosa River Basin Management Plan is to, "*Improve, protect and maintain the beneficial uses and water quality standards of the Upper Coosa River through a basin-wide public/private partnership*." This goal will be achieved by implementing the following objectives. The order of the objectives is random and does not indicate any particular ranking.

1. Reduce pollution from agricultural activities

2. Reduce pollution from forestry activities

3. Reduce pollution from construction and other land disturbance activities

4. Reduce nonpoint source pollution from urban sources

5. Reduce pollution from domestic onsite sewage disposal systems (OSDS)

6. Prepare a joint comprehensive plan for Cherokee County and all incorporated cities to support future development needs and ensure effective stormwater management

7. Reduce pollutants generated by water-related recreational activities

8. Protect groundwater resources through conservation and pollution prevention

9. Promote wetlands, other critical area, and fish and wildlife habitat protection management measures

10. Inventory and monitor the physical, chemical and biological parameters for surface and groundwater

11. Assess the effectiveness of the Upper Coosa River Basin Management Plan and make adjustments to expeditiously achieve the desired goal and objectives

12. Increase citizen awareness for watershed protection, and develop long-term support and involvement of citizens for watershed planning and management.

B. Plan Overview

This Management Plan was written for easy use and is organized into the following Sections:

- Section I provides an Introduction and list the Goal and Objectives.

- Section II provides a description of the river basin including its location, geological features, climate, water resources, sociological setting and environmental significance.

- Section III depicts real and potential water quality and natural resource problems and concerns.

- Section IV provides a strategy to protect the Upper Coosa River Basin and defines specific actions needed to efficiently and effectively achieve the plan's goal and objectives.

This Management Plan strongly encourages a full and balanced representation of all stakeholders in the Upper Coosa River Basin – with no one interest group dominating. Partnership cooperation is crucial in order to address many complex and inter-related basin issues and to sustain cooperation and trust among stakeholders. This Plan will continue to count on stakeholders to mutually pool their knowledge and experience and to challenge and communicate with each other. Respect and cooperation and well-defined partnership roles and responsibilities will characterize plan development and implementation. In order to achieve these plan aspects in the most efficient and effective manner, this basin Plan is coordinated with and an integral component of the, *Alabama Clean Water Partnership Program.*

The Alabama Clean Water Partnership (CWP) is a statewide nonprofit organization incorporated in 2001. It serves as an umbrella organization for a coalition of public and private individuals, companies, organizations and governing bodies working together to protect and preserve water resources and aquatic ecosystems throughout the State. The purpose of the Alabama Clean Water Partnership is to bring together various groups in order to coordinate their individual efforts, share information and plan more effectively for protection and preservation. The CWP, administered by a Board of Directors, is organized to allow representatives with diverse interests to develop, support, and coordinate efforts to restore, maintain, and protect the waterways of Alabama. The benefits to all participants are:

- Improved communication
- Data and information consolidation
- Improved coordination
- Opportunity for collaboration

The Upper Coosa River Basin Clean Water Partnership – Citizen Advisory Committee (CAC), comprised of stakeholders with basin wide interest in water quality and aquatic life, is loosely in-place but does not meet regularly. The purpose of the CAC is to facilitate communication and exchange of information, and to provide a vision for the protection and restoration of surface and groundwaters in the Upper Coosa River Basin.

This basin Management Plan is an integral component of the statewide CWP and basin-specific CAC efforts. It provides strategies to resolve “big-picture” water quality problems across a wide physio-geographic area. It will help ensure that subwatershed or stream-segment management activities are well designed and coordinated. It may also be used as a foundation to develop or strengthen other water quality protection approaches, TMDL implementation plans, or other watershed based management plans. This approach will maximize the wise use of limited funding by targeting resources to priority problems and areas and eliminating duplication of efforts.

The CWP strongly advocates citizen education and outreach. Stakeholder education is an important component of this Plan. Education increases public awareness and knowledge about basin issues, provides the skills to make informed decisions, and motivates stakeholders to take responsible actions. Education and outreach will be based on objective and scientifically sound information, and will be more than just “information dissemination” i.e., providing facts or opinions about an environmental issue or problem. Activities will be designed to teach stakeholders how to weigh various sides of an issue through critical thinking, and to enhance their problem-solving and decision-making skills. It will not advocate a particular viewpoint or course of action, but will be consensus driven.

Management Plan comments and suggestions can be made at anytime to the statewide Clean Water Partnership (CWP) Coordinator or the Coosa River Basin Facilitator. A thorough review of the Management Plan will be conducted at least annually by the Upper Coosa River Basin – Citizen Advisory Committee (CAC) to assess new basin concerns, or to fill in information and management practice and information gaps. Modifications or revisions to this Plan will be through CAC committee reviews and consensus. Course corrections, if any, will be determined by the CACs after public input and comments are received.

The Clean Water Partnership and the Coosa Basin Facilitator may be contacted as follows:

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II. RIVER BASIN DESCRIPTION

Physical Characteristics

The Upper Coosa River Basin (Hydrologic Unit Code 03150105) is predominately located in Cherokee County in northeast Alabama with reaches into DeKalb, Calhoun, and Cleburn Counties (Figure 2-1). The Basin contains 16 subwatersheds. The mainstem portion of the river basin is largely impounded by Weiss Lake, which extends approximately 52 miles upstream from Weiss Dam near Centre, Alabama, into Floyd County in northwest Georgia. This plan addresses only that portion of the Upper Coosa River Basin that lies in Alabama.

Watersheds do not conform to politically defined boundaries. Several political units exist within the Upper Coosa River Basin and some watershed management decisions will be influenced by local government resolve. With increasing population growth, urban sprawl, and competition for water use increasing, real and continued threats to water quality are likely. This management plan promotes a complementary regulatory and voluntary approach to ensure balanced environmental protection and economic vitality. It is also designed to support regional and local planning authority and governmental decisions. In addition, it champions the connection between land use, quality of life, and protection of natural resources. Table 2.1 lists the primary municipalities in the basin. In addition to this list, there are numerous unincorporated communities.

Table 2.1

Municipalities within the Upper Coosa River Basin (NRCS, formerly SCS, 1985)

County	% of County Within the Basin	Municipalities
Cherokee	92%	Centre, Leesburg, Cedar Bluff, Gaylesville, Sandrock, Spring Garden
DeKalb	18%	Mentone, Ft. Payne
Calhoun	9%	Piedmont
Cleburn	17%	No incorporated communities

About 62% of the Upper Coosa River Basin is characterized as forest land. Land coverage and uses presented in Figure 2.2 also include cropland (13%); hay or pasture (11%); urban (4%); open water (7%); and other uses (3%). Table 2.2 summarizes agricultural activities. Appendix 1 depicts land use by subwatershed.

Table 2.2
Agricultural Activities within the Upper Coosa River Basin, 2001 (Alabama Agricultural Statistics. Bulletin 44, 2002.)

Commodity	Production
Row Crops	***Acres***
Cotton	21,900
Soybeans	7,700
Corn	8,900
Tomatoes	100
Other Crops	
Hay	14,000
Wheat	17,000
Other	400
Livestock	***Head***
Beef	32,000
Dairy	100
Poultry (broilers) Swine	5.7 M*

*Annual production. Approximately 700,000-850,000 broilers are on farms at a given point in time.

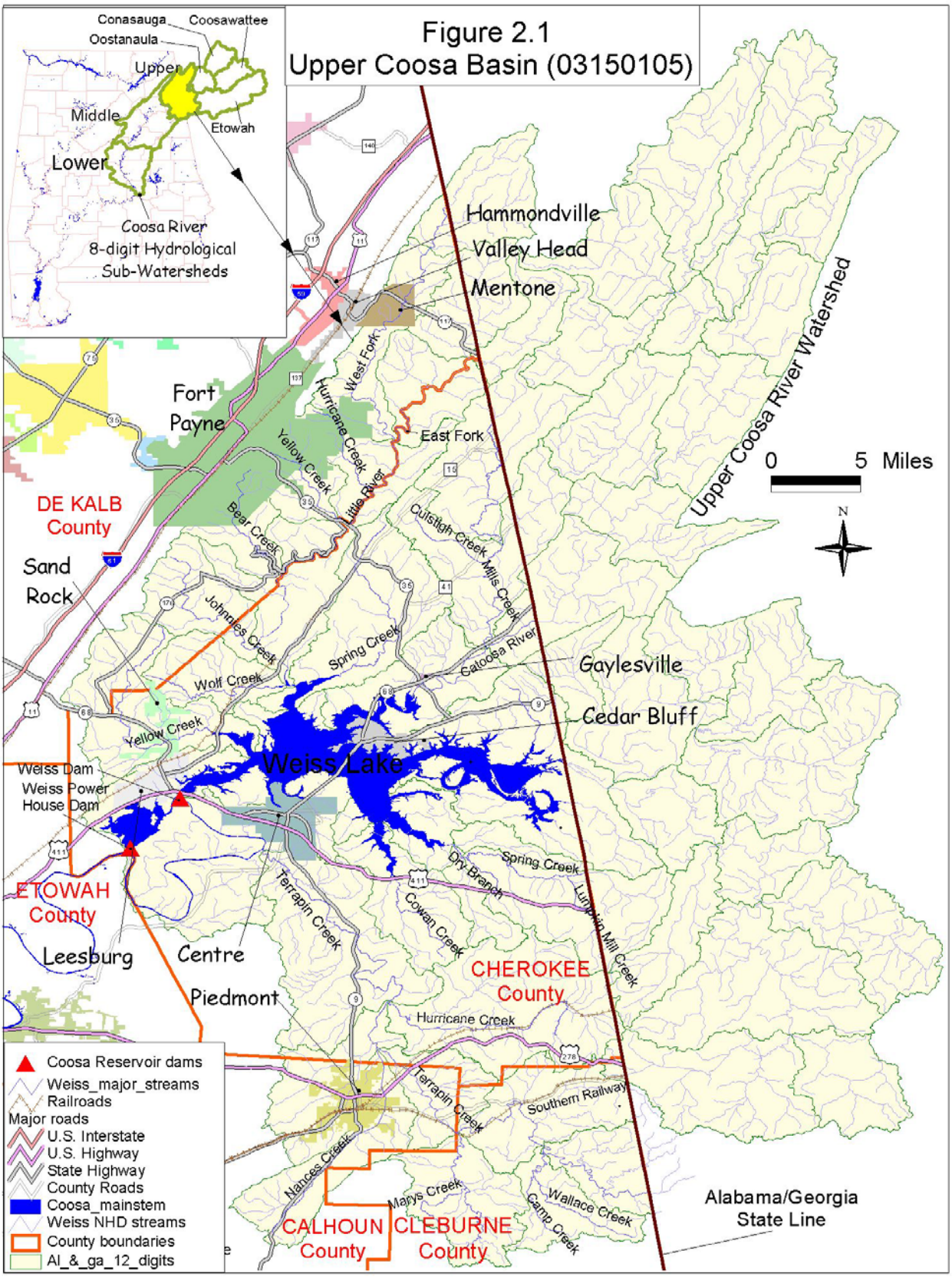
Figure 2.1
Upper Coosa Basin (03150105)
Conasauga
Coosawattee
Oostanaula
Upper
Middle
Etowah
Lower
Coosa River
8-digit Hydrological
Sub-Watersheds
Hammondville
Valley Head
Mentone
Upper Coosa River Watershed
0 5 Miles
N
Fort
Payne
West Fork
Hurricane Creek
East Fork
Yellow Creek
Little River
Bear Creek
DE KALB
County
Sand
Rock
Johnnies Creek
Cuistigh Creek
Mills Creek
Spring Creek
Wolf Creek
Coosa River
Gaylesville
Cedar Bluff
Yellow Creek
Weiss Lake
Weiss Dam
Weiss Power
House Dam
Dry Branch
Spring Creek
Lumpkin Mill Creek
Terrapin Creek
Cowan Creek
ETOWAH
County
Leesburg
Centre
Piedmont
CHEROKEE
County
Hurricane Creek
Terrapin Creek
Southern Railway
Nances Creek
Marys Creek
Wallace Creek
Camp Creek
CALHOUN
County
CLEBURNE
County
Alabama/Georgia
State Line
Coosa Reservoir dams
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Railroads
Major roads
U.S. Interstate
U.S. Highway
State Highway
County Roads
Coosa_mainstem
Weiss NHD streams
County boundaries
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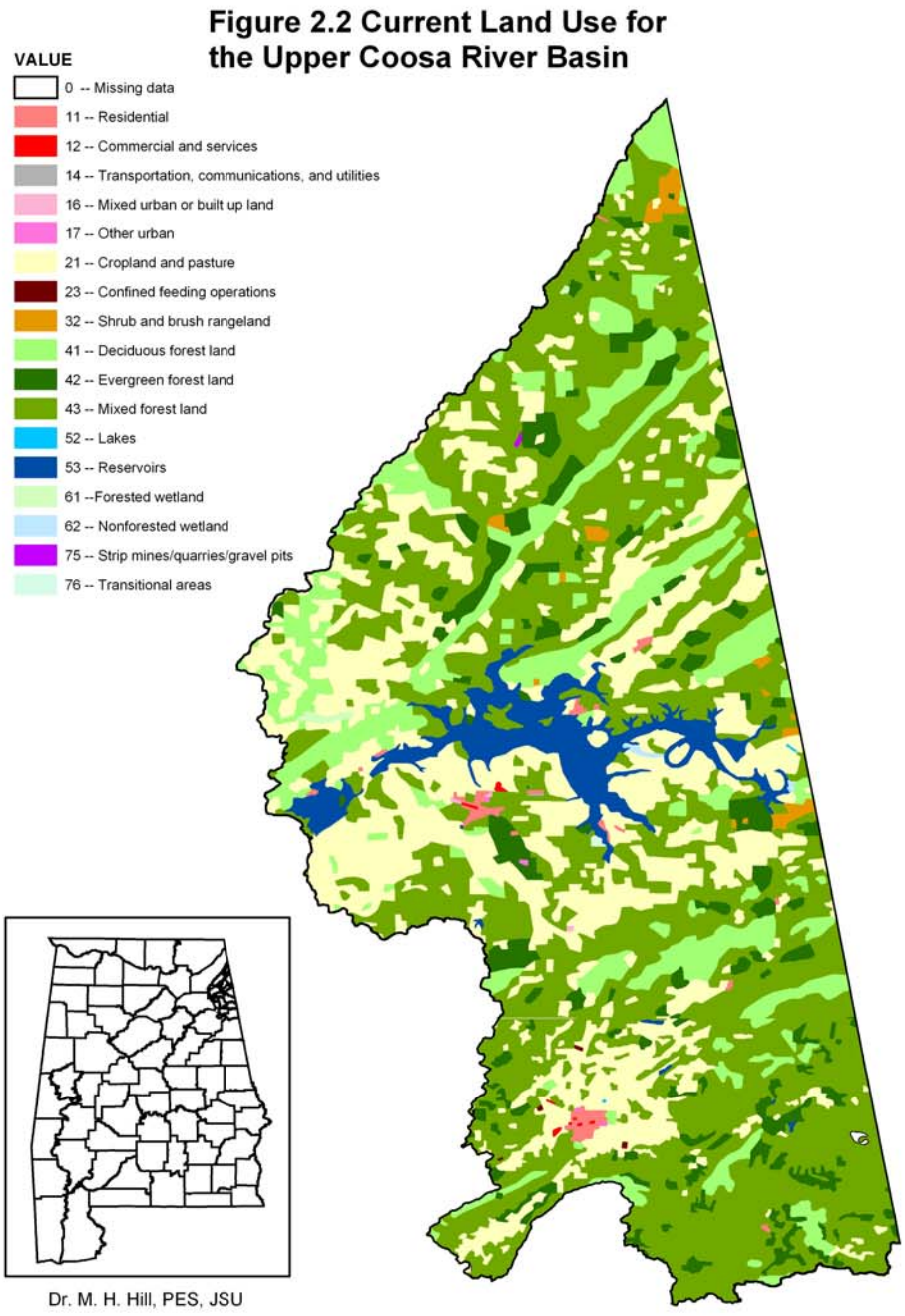
Figure 2.2 Current Land Use for the Upper Coosa River Basin



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Geological Features (Adapted from *Ecoregions of Alabama and Georgia*, Griffith, 2002)

The Upper Coosa River Basin lies within three different Ecoregions: the Piedmont (Subregion 45d), the Ridge and Valley (Subregions 67f-67h) and the Southwestern Appalachians (Subregions 68c, 68d). The topography varies from gently sloping valley land to steeply sloping mountain land.

The Ridge and Valley region is predominately composed of limestone, shale and cherty dolomite in the valleys. Sandstone, shale, siltstone, and conglomerate constitute the ridges. Soils vary in their productivity from a relatively fertile floodplain, to low fertility in stony, sandy-ridge areas. Soils in the Southern Shale Valley portion of the ecoregion tend to be deep, acidic, moderately well-drained and slowly permeable. Numerous springs, caves and sinkholes are common in this ecoregion.

The geology of the Piedmont subregion consists mostly of phyllite, quartize, slate, metasiltstone and metaconglomerate. The soils are derived from slate and are shallow to deep, well drained, steep and loamy.

The Southwestern Appalachians Ecoregion fragment of the basin is characterized by steep forested slopes and punctuated with gorges and ravines and high-gradient, high-velocity streams. The geologic strata include limestone, sandstone, siltstone, shale, chert and conglomerate.

Erosion and sedimentation poses a considerable threat to water quality with cropland erosion averaging 2T. This is double the soil loss or “tolerance” (T) value, i.e., the amount of soil that could be lost without a decline in productivity, and thereby maintaining crop productivity indefinitely. Most of the soils also have a high potential for leaching of nutrients and pesticides to groundwater.

Climate (Adapted from APC’s FERC Coosa/Warrior Relicensing Project. 2000)

The Upper Coosa River Basin has a temperate climate. The summers, from about May to mid-September, are hot and humid. Summertime temperatures average 70ºF, with an average daily maximum of 89ºF. The winters are moderately cold. Average winter temperatures are around 44ºF, with freezing temperatures occurring about 70 times per year.

In an average year, any one location in the Upper Coosa Basin will receive measurable rain on approximately 115. The total annual precipitation of 49 inches is well distributed with summer months (June to September) receiving about 4 inches per month; and an average of 5.5 to 6 inches during the months of December to March. The average year-round relative humidity is approximately 57 percent at noon and 80 percent at midnight.

Water Resources

Surface Water Resources

The Upper Coosa River Basin is a subbasin of the Coosa River Basin. A total of 16 subwatersheds delineated by geographical features further define the Upper Coosa River Basin (Figure 2.3). Numerous perennial and intermittent streams discharge to the Upper Coosa River. Many of the streams have been channelized or lack streambank protection or riparian corridor management measures.

Weiss Lake was created in 1961 when Alabama Power Company (APCo) installed a dam on the Coosa River to generate hydroelectric power. The drainage area to the lake is approximately 5,270 square miles. Weiss Lake has an approximate surface area of 30,200 acres and 450 miles of shoreline.

The dams provide flood control from heavy rains and low-flow augmentation during dry periods. The reservoir also provides recreational and economic opportunities including boating, fishing, swimming, picnicking, and camping. There are numerous marinas, campgrounds and picnic areas along the shoreline. Several major fishing tournaments take place on the lake each year. Surface water accounts for almost 85 percent of all water withdrawn within the Upper Coosa Basin as shown in Table 2.3.

Groundwater Resources

Groundwater is abundant in the Ridge and Valley province with limestone, dolomite, and sandstone aquifers capable of producing more than 100 gallons per minute (gpm). Some wells can yield up to 1,600 gpm. Groundwater is an important source of water for the industrial and agricultural sectors. Table 2.3 provides a summary of groundwater and surface water uses in the Upper Coosa.

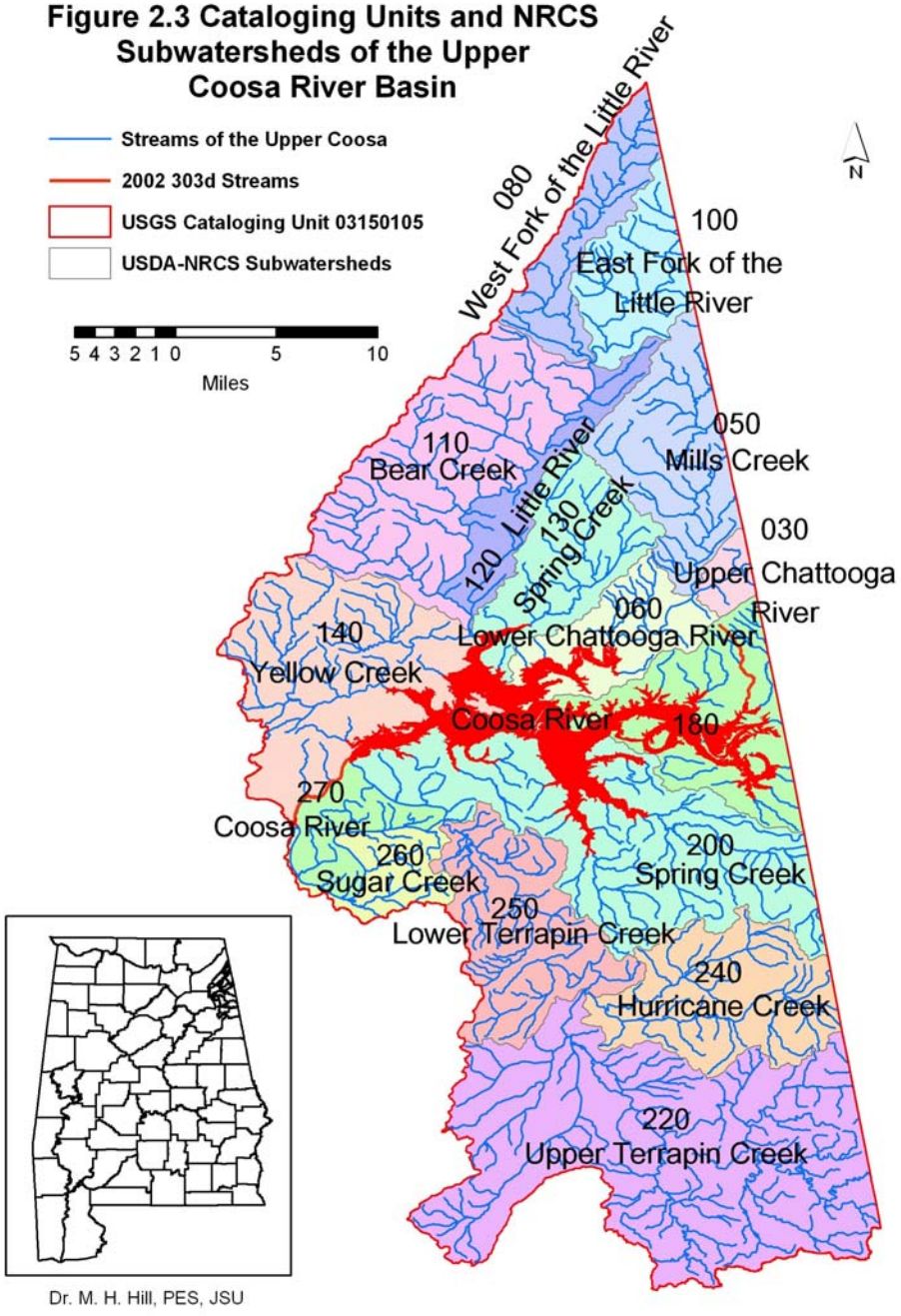
Table 2.3

Groundwater and Surface Water Use in the Upper Coosa River Basin (Mooty, 1995*)

Withdrawal Use	Surface Water	Groundwater
	Millions of Gallons Per Day	
Public Supply	2.73	0.34
Rural Domestic	0	0.44
Industrial	0	0.05
Livestock	0.82	0.23
Irrigation	3.54	0.06
Total	**7.09**	**1.12**

*1995 is the latest available data; the 2000 data are currently being reviewed and prepared for publication

Figure 2.3 Cataloging Units and NRCS Subwatersheds of the Upper Coosa River Basin



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Sociological Setting

Demographics

Approximately 47,000 people reside in the Upper Coosa River Basin. Cherokee County is growing more than twice as fast as the State average, with the U.S. Census reporting a 22.7% change since 1990. DeKalb county is also growing faster than the State, with a 17.9% change since 1990. The State increase averaged only 10.1%. Population trend data anticipates continued increase in growth, especially along lakeshores. Demographic information for counties in the Upper Coosa is listed in Table 2.4.

Table 2.4
County Profile Information for Upper Coosa River Basin Counties (U.S. Bureau of the Census: State and County QuickFacts, 2002)

County	Total Population	Estimated Population within Watershed	Percent Change since 1990	Median Household Income
Calhoun	112,249	10,500	-3.3%	$31,768
DeKalb	64,452	12,000	17.9%	$30,137
Cleburne	14,123	2500	10.9%	$30,820
Cherokee	23,988	22,100	22.7%	$30,874
Total	**---**	**47,100**	**---**	**$35,240**

Economy

Income generated by major economic sectors in Upper Coosa River Basin counties is shown in Table 2.5. Retail trade and manufacturing are the primary economic drivers for the region. Current trends show these industries will most likely continue to dominate the economy of the Upper Coosa River Basin.

Agricultural commodities, including production and processing of commodities, and sales of goods and services to farms, provide an important economic stimulus. DeKalb County is ranked second in Alabama for total farm and forestry receipts. DeKalb County ranks first in production of swine, layer and broiler chickens; second for cattle; and third for corn production. Row crops are the dominant agricultural commodity for Cherokee County with production of cotton, soybeans and wheat ranking eighth, tenth, and sixteenth in state, respectively.

Tourism is also important to local economies. Weiss Lake is known as the “Crappie Capital of the World” and issues more out-of-state fishing licenses than any other site in Alabama. It is unknown exactly how much revenue is generated by tourism in the area. A 1995 study of the economic values of Weiss Lake to Cherokee County determined that the recreational use of the lake generates approximately $201 million per year in sales, $36 million per year in wages, and 4,132 full-time and part-time jobs. The major expenditures in Cherokee County related to Weiss Lake were lodging, food and drink, automobile gasoline, boat gasoline, and miscellaneous camping supplies (A.L. Burress Institute of Public Services et al., 1995).

Other tourist attractions in the basin include DeSoto State Park, in DeKalb County, which offers a newly renovated resort lodge, chalets and cabins, as well as 78 campgrounds.

Table 2.5
Receipts for Major Economic Sectors for Counties within the Upper Coosa River Basin (U.S. Bureau of the Census, 1997; Alabama Agricultural Statistics. 2001)

County	Manufacturing	Wholesale Trade	Retail Trade	Agriculture
	1000 $			
Calhoun	1,504,506	890,936	981,985	41,806
DeKalb	1,285,968	309,628	343,027	291,185
Cleburne	175,147	D	53,951	45,762
Cherokee	121,248	65,174	123,145	48,536

D = Withheld to avoid disclosure

Natural Resources

Natural resources are abundant in the Upper Coosa River Basin and include several recreational and aesthetic opportunities. Little River Canyon, a National Preserve, is one of the highlights. Encompassing 14,000 acres, the Preserve is one of the deepest, most extensive canyon and gorge systems east of the Mississippi River. It serves as a habitat for wildlife, including a number of rare and endangered plant and animal species, including the blue shiner, green pitcher plant and Kral's water plantain. Little River is unique in that it flows atop Lookout Mountain for nearly its entire length before emptying into Weiss Lake. It also has the distinction of being designated an *Alabama Outstanding Waters*, reserved for only the most pristine waters of the State.

Rock-climbers travel from all over the Southeastern U.S. to climb the boulders at Cherokee Rock Village, a 200-acre county-owned park located in Sandrock. Huge sandstone and quartz formations rise to 150 feet and measure 70 feet wide in some areas. The site includes caves and trails and mountaintop view of Weiss Lake and on a clear day, visitors can see from Rome, GA to Gadsden, AL.

Fishing and boating are the most popular recreational activities in the Upper Coosa as evidenced by the number of fishing tournaments held on Weiss Lake. The dominant recreational fish species include crappie, largemouth and spotted bass, striped and hybrid bass, bluegill and redear sunfish, and catfish. Additional recreational activities include hunting, camping, hiking, horseback riding, mountain biking, swimming, canoeing and kayaking.

Threatened and Endangered Species
The Mobile River Basin, which includes the Coosa River system, is one of the most biologically diverse ecosystems in the nation. However, human impact to the environment has resulted in species extinctions at rates faster than anywhere in the continental United States. Of all the U.S. species extinctions that took place in the twentieth century, almost 50 percent occurred in the Mobile River Basin (USFW, 2002).

The Nature Conservancy has adopted an ecoregion-based approach for protecting biological diversity. Ecoregions are areas of general similarity in ecosystems and environmental resources. By carefully choosing priority ecoregions for conservation, the Conservancy hopes to conserve all at-risk freshwater fish and mussel species in the United States. The organization has focused the conservation effort on 327 subbasins across the Nation, making up 15% of the total land area. The Upper Coosa is among these targeted subbasins, since it has a large number of at-risk fish and mussel species located in its boundaries (Master, 1998). Table 2.6 lists threatened and endangered species in the Upper Coosa River Basin.

Table 2.6
Federally Listed Threatened and Endangered Species in the Upper Coosa River Basin* (USFW, 2002)

Scientific Name	Common Name	Counties of Occurrence	Status
Lampsilis altilis	Fine-lined pocketbook mussel	Calhoun, Cherokee, Cleburne	T
Medionidus parvulus	Coosa moccasinshell mussel	Cherokee	E
Pleurobema georgianum	Southern pigtoe mussel	Calhoun, Cleburne	E
Pleurobema perovatum	Ovate clubshell mussel	Cherokee	E
Pleurobema decisum	Southern clubshell mussel	Calhoun, Cherokee, Cleburne	E
Epioblasma metastriata	Upland combshell mussel	Cherokee	E
Ptychobranchus greenii	Triangular kidneyshell mussel	Calhoun, Cherokee, Cleburne	E
Leptoxis taeniata	Painted rocksnail	Calhoun	T
Tulotoma magnifica	Tulotoma snail	Calhoun	E
Cyprinella caerulea	Blue shiner	Calhoun, Cherokee, DeKalb	T
Myotis grisescens	Gray bat	Calhoun, DeKalb	E
Myotis sodalis	Indiana bat	DeKalb (P)	E
Sciurus niger	Eastern fox squirrel	Cherokee	PS
Aneides aeneus	Tiger salamander	Calhoun	PS
Picoides borealis	Red-cockaded woodpecker	Calhoun, Cleburne	E
Haliaeetus leucocephalus	Bald eagle	Cherokee	T
Xyris tennesseensis	Tennessee yellow-eyed grass	Calhoun	E
Marshallia mohrii	Mohr's Barbara's buttons	Calhoun, Cherokee	T
Platanthera integrilabia	White fringeless orchid	Calhoun, Cleburne	C
Sarracenia oreophila	Green pitcher plant	Cherokee, DeKalb	E

***The T&E species occur in the counties listed above, but may or may not be present in the Upper Coosa Watershed. Some counties make up a very small percentage of the watershed.**

T = Threatened
E = Endangered
C = Candidate Species
PS = Partial Status

III. PROBLEMS

Overview

Pollution is generally categorized as either “point” or “nonpoint” source. Point source pollution results from pollutants discharged from identifiable “points”, i.e., “end-of-pipe” discharges. Point source pollutants originate from municipal wastewater treatment facilities and industrial discharges, and effluent from animal feeding operations and solid waste disposal systems. Point source discharges are managed by ADEM through the National Pollutant Discharge Elimination System (NPDES) permitting process. There are numerous point source NPDES permitted discharges to the Upper Coosa River mainstem and its tributaries (Appendix 2).

Many waterbodies receive significant pollutant loadings related to man and his land-use activities. This is known as nonpoint source pollution. Pollutants originate from runoff associated with agriculture, forestry, construction and urban, mining, land disposal, and other sources. The causes of nonpoint source pollution is generally associated with stormwater runoff that transports sediment, nutrients, fertilizers, chemicals, pesticides, petroleum products, and other contaminants to receiving waters. Atmospheric deposition may also contribute nonpoint source pollutants. Pollution occurs when the rate at which these types of contaminants entering the receiving waterbody exceed natural background levels. Nonpoint source pollution is a challenge to control because of the diversity of sources and complexities associated with the interactions of many pollutants.

Many of the water pollution problems in the Upper Coosa River Basin may be attributable to inadequate or malfunctioning onsite septic treatment systems, increasing urban sprawl, and erosion and sedimentation from construction, forestry, mining, agricultural, and other land disturbance activities. Pollutants transported from upstream Coosa River sources, such as nutrients and PCBs, also have a direct effect on the Upper Coosa. It is imperative that upstream and interstate pollution problems be addressed through the Upper Coosa River Basin Clean Water Partnership and other interstate Federal, State, and local stakeholders.

There are several documented water quality problems in the Upper Coosa River Basin. However, some pollutant sources and causes remain unknown, or are inadequately monitored and assessed—especially in the tributaries. Increased and continued monitoring and analyses of the physical, chemical, biological, and habitat conditions of Weiss Lake and tributaries is required. Additional soils, land use, topography and water quality data are needed to provide reliable and scientifically defensible indicators of real and potential threats to the basin’s environmental and economic health.

A multidisciplinary basin management approach is needed to address a myriad of pollution causes and sources, and to effect long-term solutions. Installation of site-specific BMPs can make important contributions to water quality protection. Management measures should be coordinated with upstream and downstream stakeholders, and adequate in number and types. Subwatershed or stream segment management practices and TMDL implementation plans must consider citizen values, interest, and opinions, and be consistent with this Plan’s basin-wide management approach, i.e., they take into account the “big picture.”

Water quality management efforts in the Upper Coosa River Basin should address all aspects of water quality problems for all beneficial uses of water, and the lands from which pollutants originate. Water quality control efforts should focus on safe disposal of pollutants and their treatment. This Management Plan, at a minimum, will:

a) Protect, restore, and maintain surface water and groundwater quality
b) Protect human health
c) Protect fish and wildlife and restore and improve natural habitats
d) Protect, restore, and maintain the visual (aesthetic) and recreational values of natural resources
e) Use sound science in decision-making processes
f) Balance environmental protection with reasonable economic feasibility
g) Promote new and innovative solutions
h) Be grounded in broad public support
i) Encourage private and public partnerships
j) Embrace a holistic basin-wide protection approach

Data Collection
Physical, chemical, biological, and habitat data should be adequately assessed throughout the Upper Coosa River Basin. Physical data includes the measuring of water quality parameters such as temperature, flow, and condition of stream banks and lakeshores. Examples of chemical data may include dissolved oxygen content, suspended solids, nutrients, metals, oils and pesticides analyses. Biological monitoring assesses plant and animal numbers, diversity and habitat quality.

It is important to remember that any particular monitoring data is only a snapshot of what is happening in the stream or lake at that point in time. The time of day, season, and wet or dry conditions have a significant effect on results. There are also great variances in methodologies of data collection making some data comparison results difficult. The frequency of data collection also varies, depending on the type of information being pursued. Monitoring data may be collected at regular sites on a continuous basis (fixed station monitoring), at selected sites on an as-needed basis to answer specific questions (intensive surveys), or on a temporary or seasonal basis (such as during the growing season).

Appendix 3 provides summaries of Upper Coosa data collection projects, including lead agency, project objectives, types of assessments conducted and data collected. Maps of data collection points are presented in Figures 3.1 and 3.2. Appendices 4 and 5 provide location descriptions of data collection points.

Monitoring should be conducted using a river basin approach in order to assess the “big-picture.” In addition, subwatersheds must be assessed in order to define local sources and causes of pollution and to target management measures. Data should be compared to ecoregional and reference sites to determine best case scenarios and trends. Information and data should be collected using EPA and ADEM approved Standard Operating Procedures (SOP) and Quality Assurance/Control (QAC) protocols. Coordination with the Alabama Clean Water Partnership and citizen volunteer water quality monitoring (Alabama Water Watch) is highly recommended.

State and Federal Water Use Classifications and Water Quality Criteria
The ADEM has developed water quality standards for the following parameters: treatment of toxic substances; taste and odor producing substances; sewage; industrial wastes or other wastes; pH; water temperature; dissolved oxygen; bacteria; radioactivity; toxins; and turbidity. Water quality criteria are defined by the waterbody’s use classification, as adopted under Chapter 335-6-11 of ADEM’s Administrative Code (1975 Title 22 Section 22-22-1).

Alabama’s water use classifications include: Outstanding Alabama Water, Public Water Supply, Swimming and Other Whole Body Water-Contact Sports, Shellfish Harvesting, Fish and Wildlife,

Limited Warmwater Fishery, and Agricultural and Industrial Water Supply (Table 3.1). All water use classifications are present in the Upper Coosa River Basin – except for Outstanding Alabama Water.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a List of Impaired Waters that are not meeting, or not expected to meet, water quality standards even after technology-based pollution controls are in place. Federal regulations require states to submit a new list at least every four years. The Section 303(d) List of Impaired Waters for the Upper Coosa River Basin is presented in Table 3.2. The latest revisions or information regarding the Section 303(d) List is available on the ADEM website: (http://www.adem.state.al.us/WaterDivision/WQuality/TMDL/TMDLs.htm)

Total Maximum Daily Load (TMDL)
A TMDL is the maximum pollutant loading allowed for a body of water. In determining a TMDL, a model is used to predict how various pollutants effect water quality and provides a maximum loading target in order for the waterbody to meet water quality standards and use classification. Calculations are based on the pollutant loading from point sources, plus the pollutant loading from nonpoint sources – with an added margin of safety. The TMDLs in Alabama are developed consistent with a specific schedule mandated by a 1998 Court Order, which was a result of a citizen lawsuit filed against EPA.

The states are responsible for prioritizing their Section 303(d) List of Impaired Waters and for developing a Total Maximum Daily Load (TMDL) for each pollutant causing a water quality standard violation. The EPA can approve or object to a state Section 303(d) list and any TMDL developed by the state. If the EPA rejects the list, or the states do not adopt a TMDL to address the problem, the EPA will establish a new list and/or prepare a TMDL on the state's behalf.

EPA chose to develop a TMDL for Weiss Lake for nutrients. The plan has yet to be approved due to concerns of potential data gaps—specifically the assumptions used to develop the nutrient-loadings model. An approved TMDL is expected to be available by the end of calendar year 2004.

A priority consideration of this Management Plan is to address Section 303(d) listed waters using a watershed based approach. Strategies effect long-term solutions. Funding, local interest, a myriad of sources and causes, and other constraints may inhibit timely implementation of some TMDLs or may hinder plans to implement TMDLs using a holistic watershed protection approach. It is acknowledged that even after reasonable steps have been taken to control pollutants, it may take many years for a Section 303(d) listed water to achieve water quality standards. However, implementation of TMDL management measures will proceed as expeditiously as possible.

Figure 3.1 Upper Coosa River Basin Data Collection Points from 1992-2002 (From Appendix 4)

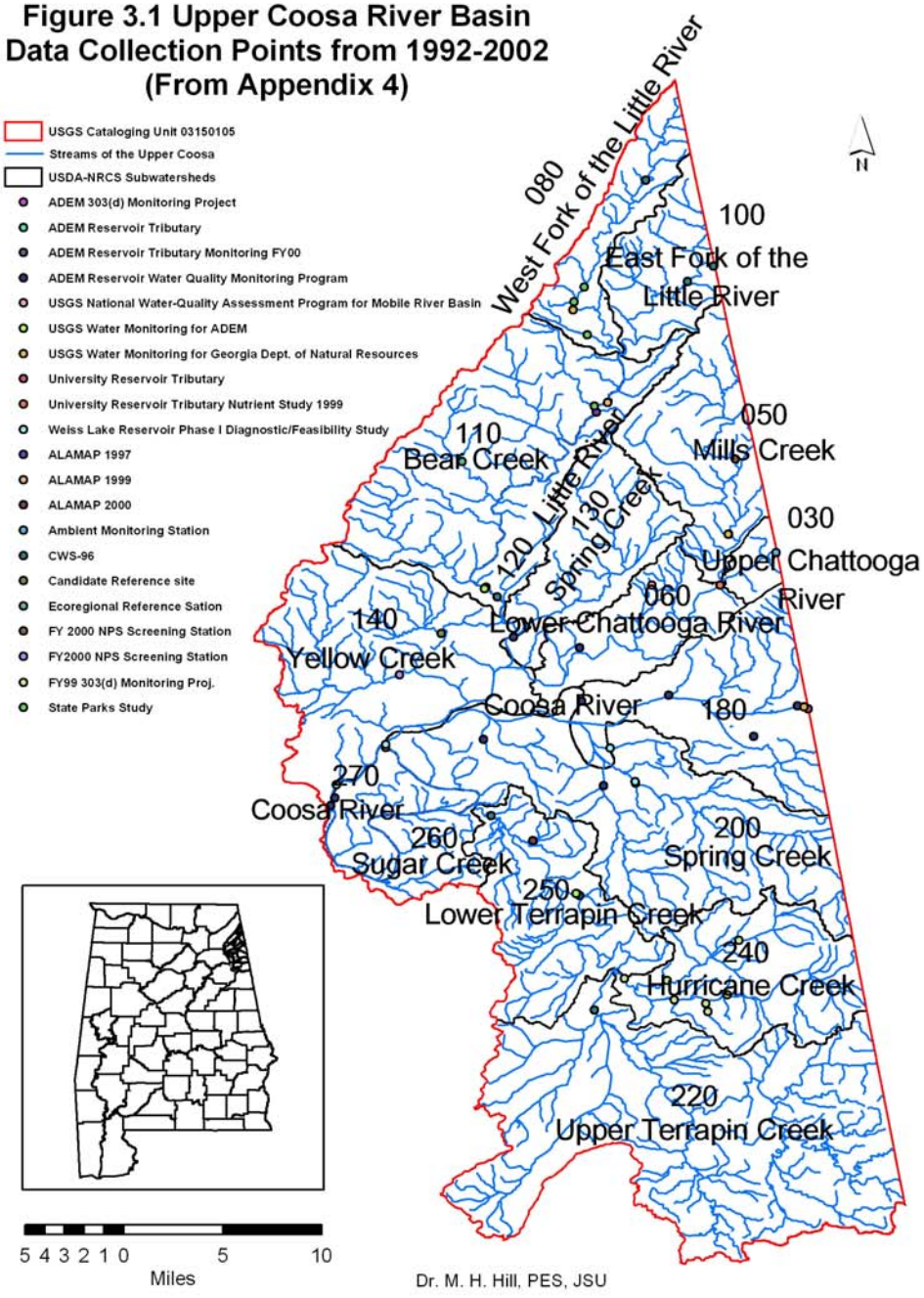


Figure 3.2 Alabama Water Watch Data Collection Points in the Upper Coosa River Basin 2003 (From Appendix 5)

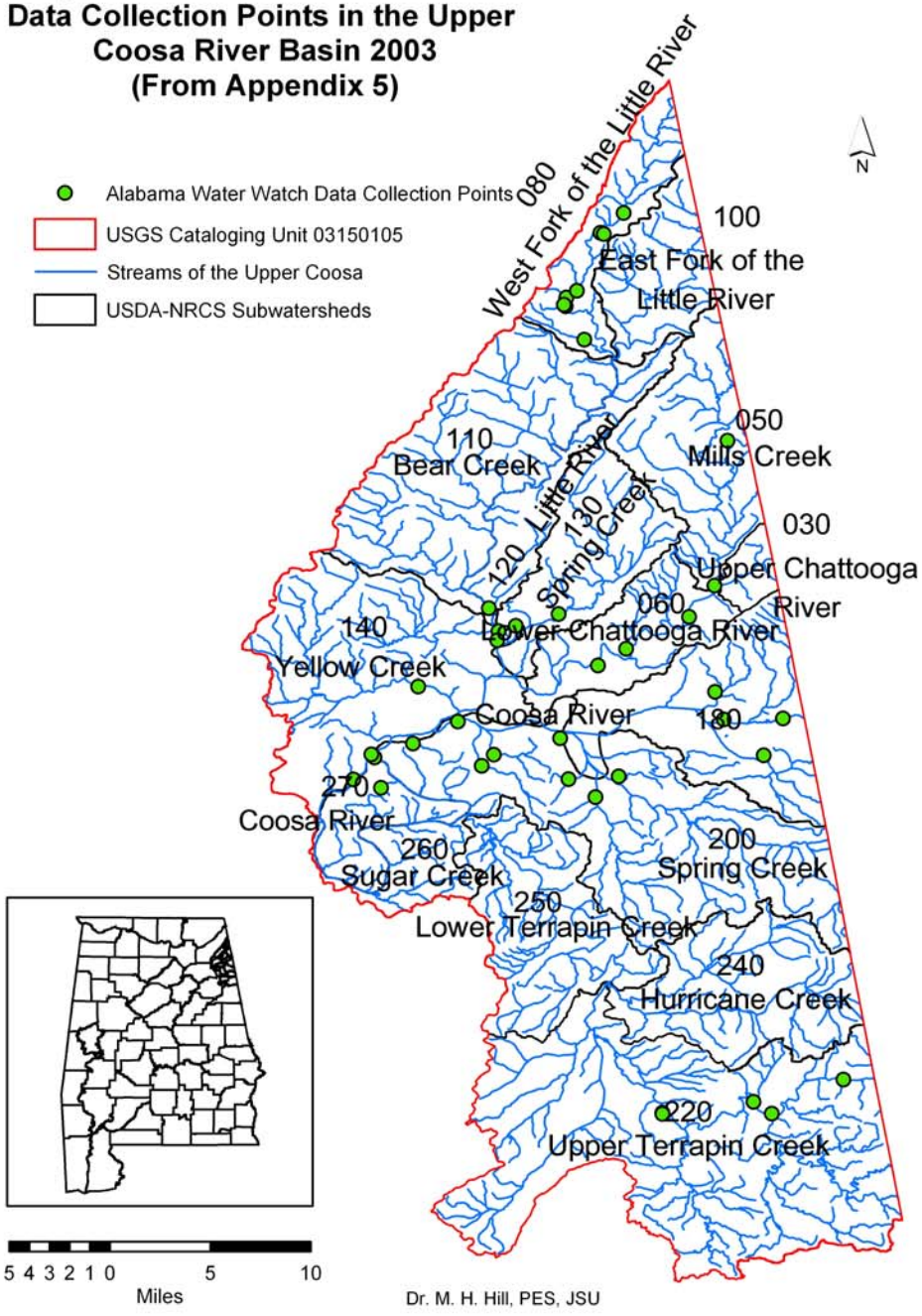


Table 3.1
Summary of ADEM's Water Use Classifications and Water Quality Criteria (WRAS Guidance: Useful Things to Know)

Rank	Classification	Sewage, Industrial Waste or Other Waste	Ph (s.u.)	Temperature (ºF)	Dissolved Oxygen (mg/l)	Bacteria (colonies/100 ml)	Turbidity (NTU)	Toxicity, Taste, Odor & Color
1	Outstanding National Resource Water (ONRW) i	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 ORW waterbody, however it has been classified by ADEM as a PWS, S & F&W, therefore the applicable water 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 90ºF; (86ºf) ii; Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF) 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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF)	Shall not be less than 5.0	1000 geometric mean 2000 max. single sample (year-round) [100 (coastal waters) and 200 (all other waters) Jun-Sep] iv	Shall not exceed NTUs above above background	Shall not render waters unsafe or unsuitable for drinking supply or food processing; must meet all toxicity requirements, & 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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF)	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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF)	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

Table 3.1, cont.

Summary of ADEMS' Water Use Classifications and Water Quality Criteria (WRAS Guidance: Useful Things to Know)

Rank	Classification	Sewage, Industrial Waste or Other Waste	Ph (s.u.)	Temperature (ºF)	Dissolved Oxygen (mg/l)	Bacteria (colonies/100 ml)	Turbidity (NTU)	Toxicity, Taste, Odor & Color
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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF)	Shall not be less than 5.0	1000 geometric mean 2000 maximum any sample (year-around) : [100 (coastal waters) and 200 (all other waters) Jun-Sep]	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
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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF; (4.0/1.5ºF)	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; nor exceed a maximum of 2000 of 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 90ºF; (86ºF) Maximum instream rise above ambient conditions shall not exceed 5ºF	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 upon the particular waterbody and its associated use classification.

ii. For streams, lakes and reservoirs in the Tennessee and Cahaba River Basins, and for specific segment of the Tallapoosa River Basin, that has been designated by the Alabama Department of Conservation and Natural Resources as supporting smallmouth bass, sauger, or walleye, the instream temperature shall not exceed 86ºF.

iii. The maximum instream temperature rise above ambient water temperature due to the addition of artificial heat by a discharger shall not exceed 4ºF in coastal or estuarinc waters during the period October through May, nor shall the rise exceed 1.5ºF 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.

Table 3.2
Upper Coosa Waters Listed on the 303(d) List (Final 2002 §303(d) List for Alabama, ADEM)

Waterbody ID	Waterbody Name	Support Status	County	Section 1.01 Uses	Causes	Sources	Date of Data	Size	Downstream /Upstream Locations	TMDL Date
AL/03150105-180_01	Unnamed Tributary to Weiss Lake	Non	Cherokee	Fish & Wildlife	Ammonia, Nutrients, OE/DO, Pathogens	Agriculture	1986	4.4 miles	BallplayCreek/ Its Source	2003
AL/Weiss Res_01	Weiss Lake	Partial	Cherokee	Public Water Supply/ Swimming Fish & Wildlife	Priority Organics Nutrients, pH	Sources outside State, Flow regulation/ modification	1992-1994	30,200 acres	Weiss Dam/ AL-GA State Line	2003

Table 3.3
Proposed Upper Coosa Water Listings and De-listings for the 2004 303(d) List (Proposed 2004 §303(d) List for Alabama, ADEM)

Waterbody ID	Waterbody Name	Support Status	County	Section 1.02 Uses	Causes	Sources	Date of Data	Size	Downstream /Upstream Locations	TMDL Date
AL/03150105-0807-200	Mud Creek	Non	Cherokee	Fish & Wildlife	Pathogens	Unknown	2002	5.1 miles	Weiss Lake/Mud Creek	2007
AL/03150105-0807-102	Spring Creek	Non	Cherokee	Public Water Supply/ Swimming Fish & Wildlife	Pathogens	Unknown	2002	5.1 miles	Spring Creek/ Its source	2007
AL/03150105-180_01	Unnamed Tributary to Weiss Lake*	Non	Cherokee	Fish & Wildlife	Ammonia, Nutrients, OE/DO, Pathogens	Agriculture	1986	4.4 miles	BallplayCreek/ Its Source	2003

* Denotes proposed de-listing from the 303(d) List

Specific Problems
Scientific investigations have identified a number of water quality problems in the Upper Coosa River Basin. Impairments involve violations of water quality criteria, human health threats, loss of indigenous plant and animal species, and loss of recreational and aesthetic benefits of Weiss Lake:

- **Violations of Water Quality Criteria in the Upper Coosa River Basin**
  A discussion of sources and causes of impairments are discussed in **A**., below.
  Specific problems include:
  Excessive nutrients
  Presence of priority organics
  Organic enrichment/low dissolved oxygen
  Pathogens
  High ammonia content
  pH imbalance

- **Impairments Adversely Affecting Quality of Life within the Upper Coosa River Basin**
  (Refer to discussion in **B**., below). Specific problems include:
  Elevated counts of pathogenic bacteria
  Evidence of fish contamination
  Contamination of public water supplies (Note: As a security measure, raw water supply intake locations are not provided in this document.)
  Incidences of illegal dumps, debris and litter

- **Impairments Adversely Affecting Native Plant and Animal Problems Species** (Refer to discussion in **C**., below). Specific problems include:
  Habitat Fragmentation
  Water Pollution caused by erosion and sedimentation
  Loss of wildlife habitat, wetlands, and forestlands

- **Other Environmental Concerns** (Refer to discussion in **D.**, below)

  A detailed discussion of each of these problems follows:

A. Violation of ADEM Water Quality Criteria (The following was partially derived from *Supplement to Guidance for Planning and Developing a Watershed Restoration Action Strategy (WRAS) – Useful Things to Know.* Alabama Clean Water Partnership. Dec. 2000.)

1. Excessive Nutrients

Nutrients include substances or compounds that contribute to plant and animal growth and development. The two major nutrients that contribute to water quality problems are nitrogen and phosphorus. Sources of these potential pollutants include fertilizers and chemicals transported by urban stormwater runoff, agricultural runoff from farm fields and feedlots, on-site sewage treatment systems, or industrial and municipal wastewater treatment plant discharges.

Nutrient enrichment in some waterbodies can result in reduced water clarity, algal blooms, and adverse affects to aquatic plants This process is called eutrophication. Eutrophication is measured by Trophic State Indices (TSI), which provides a single quantitative index for classifying surface water quality. The TSI formula is derived from a combination of secchi disc readings, surface water chlorophyll *a* concentrations, and total phosphorus for a set of North American lakes. TSI is measured on a scale ranging from 0 – 100. Lakes with a TSI of 70 or greater are considered to be *hypereutrophic* – meaning the waterbody is receiving very high rates of nutrients and is in dire need of restoration and protection. A TSI of 50-70 indicates *eutrophic* conditions – meaning the waterbody is receiving high rates of nutrients, may be very productive, and has high plant and algal growth. A TSI of 40-50 designates *mesotrophic* conditions – meaning that the waterbody is somewhat nutrient rich and moderately productive. A TSI less than 40 denotes *oligotrophic* conditions – meaning the waterbody is clear and generally unproductive with very low nutrient and algal concentrations.

According to ADEM's 2002 Section 305(b) Water Quality Report to Congress, and based on data collected in 2000, Weiss Lake exhibited August TSIs of 62. These values categorize the reservoir as euthrophic.

Alabama is in the process of developing State nutrient standards. Reservoirs in the Coosa River Basin will be sampled in 2004 to collect data to assist in adopting nutrient criteria. In order to control excessive algal growth, the EPA recommends that phosphorus levels not exceed 0.05mg/L if streams discharge into lakes or reservoirs, 0.025 mg/L within a lake or reservoir, and 0.1 mg/L in streams or flowing waters not discharging into lakes or reservoirs. The greatest amount of nutrient enrichment occurred near the Alabama-Georgia state line. The data show that as the measurements were taken closer to the dam, the concentrations of phosphorus loading in the Cherokee and DeKalb County areas than in the Georgia portion of the Upper Coosa Watershed. Although the concentrations do decline from the Alabama/Georgia state line to the dam the drop is not significant enough to eliminate algal blooms from nutrient enrichment (0.17 mg/L to 0.07 mg/L). The reduction of phosphorus loading from the Georgia and Alabama portions of the watershed will be necessary to meet the TMDL requirements and to eliminate algal blooms in the lake. Appendix 6 displays total phosphorus measurements for Upper Coosa waterbodies.

The best indicator for excessive nutrient loading is chlorophyll-α, since chlorophyll-α is a good measurement of algal growth. Dr. David Bayne of the Department of Fisheries and Allied Aquaculture at Auburn University suggests that within a reservoir, chlorophyll-*α*

should not exceed 16 µg/L during the growing season. Data show an increase in chlorophyll *a* content in Weiss Lake since the early 1990s (Appendix 7). In some instances, the mean chlorophyll-α level has more than doubled. The TMDL developed by EPA for Weiss Lake sets the chlorophyll- α at 20 µg/L , which corresponds to a TSI value of 60. This value should assure that adequate nutrients maintain the productivity of the lake for fisheries, but also reduce the potential risk for development of nuisance algal blooms and hypolimnetic oxygen deficits.

2. Presence of Priority Organics

Priority organics are compounds such as DDT and PCBs. PCBs are the primary priority organic pollutant found within the Upper Coosa. These organic compounds may be carcinogenic to humans and may contribute to deformities or death to aquatic species.

The EPA banned PCBs in 1979 because of their potential as carcinogens. However, the compound persists for long periods of time in the environment and tends to bioaccumulate as it passes up the food chain. There are no regulatory guidelines for PCBs in sediment.

3. Organic Enrichment/Low Dissolved Oxygen (OE/DO)

Organic enrichment (OE) occurs when organic matter exceeds the receiving water's capacity to maintain adequate levels of dissolved oxygen (DO) for normal respiration and decomposition processes. Sources of organic enrichment are wastewater treatment facilities, field and feedlot runoff, failing onsite septic treatment systems, and other sources. Decay of organic matter in organically enriched waterbodies can create DO depletion resulting in fish kills. Dissolved oxygen is a commonly used water quality indicator because DO levels regulate aquatic life metabolic processes. Alabama's water quality criteria mandates DO levels to be at least 5.0 mg/L for Swimming (S), Fish and Wildlife (F&W) and Public Water Supply (PWS) water use classifications, and 3.0 mg/L for A&I waterbodies. An unnamed tributary to Weiss Lake is listed on the 2002 Section 303(d) list for not meeting OE/DO criteria. However, after investigating this stream for TMDL process, ADEM has proposed de-listing for the 2004 303(d) List. Dissolved oxygen data for waterbodies in the Upper Coosa River Basin is presented in Appendix 8.

4. High Ammonia Content

Ammonia is naturally present in many surface waters. However, high ammonia levels in waterbodies can result in fish kills and noxious odors. Nitrogen, in the form of ammonia, is listed on the 2002 Section 303(d) List as a contaminant of an unnamed tributary leading to Weiss Lake. This tributary has a water use classification of Fish and Wildlife. Although there are no specific state water quality standards for ammonia, F&W narrative criteria for toxicity states that (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*." As with the OE/DO violation discussed above, the unnamed tributary is proposed for de-listing from the 2004 303(d) List.

5. pH Imbalance

The pH measures relative amounts of acids and bases in water and can range from 1 (low or acidic) to 14 (high or alkaline). When algae or plants consume carbon dioxide and produce oxygen, a chemical reaction causes the pH to increase. Decay of plant or animal matter can cause pH to decrease. All aquatic species require a particular pH range for survival and are placed at risk if the pH falls above or below this range. The criteria for pH for Swimming (S), Fish and Wildlife (F&W), and Public Water supply

(PWS) water use classifications is between 6.0 to 8.5 standard units (s.u.) for streams and reservoirs. Weiss Lake is listed on the 2002 Section 303(d) List for violation of pH standards. The pH data for waterbodies in the Upper Coosa River Basin is presented in Appendix 8.

6. Elevated counts of pathogenic bacteria

Fecal coliforms are bacteria that live in the digestive tracks of warm-blooded animals. The presence of nonpathogenic fecal coliform bacteria is used as an indicator for the possible presence of pathogenic organisms in surface and groundwaters. Fecal coliform bacteria are generally short-lived and do not reproduce in water. Coliform bacteria reach surface waters through direct contact (e.g., livestock in a stream), surface water discharges (e.g., wastewater treatment facility), rainfall runoff (e.g., pet and wildlife waste). Coliforms may also be transported to groundwater (e.g., faulty onsite septage treatment systems). Ingestion of contaminated water through activities such as drinking, swimming, or water skiing may cause waterborne diseases in humans.

The ADEM water quality criteria for fecal coliform for the Swimming (S) water use classification is not to exceed 200 colonies per 100 milliliters (Ml) during the months of June through September. This is a geometric mean, which is the average of at least five samples collected at a given station over a 30-day period at intervals of not less than 24 hours. For Fish and Wildlife (F&W) and Public Water Supply (PWS) water use classifications, fecal coliform must not exceed a geometric mean of 1000 colonies/100 Ml, nor exceed 2000 colonies/Ml in a single sample.

The USGS has been monitoring fecal coliform at the Alabama/Georgia state line since 1974. Since 1992, a total of 136 fecal coliform samples were taken. Because there were not enough samples collected to calculate an actual geometric mean, the results were compared to the single sample standard of 2000 colonies/100 mL. A total of 13 of the 136 samples were greater than the 2000 colonies/100 mL standard, or approximately 10 percent of the samples (Table 3.4). An additional 6% of the samples were greater than 1000 mg/L but less than 2000 mg/L. This result would indicate that there is a significant amount of fecal coliform entering Weiss Lake from the State of Georgia.

Recent sampling of Mud and Spring Creeks through ADEMS's 303(d) sampling program shows violation of the geometric mean criteria for Mud and Spring Creeks. The violations occurred during the summer months when incidental water contact and recreation are most likely. Table 3.4 summarizes fecal coliform problems within the Upper Coosa.

Table 3.4
Waterbodies with Potential Fecal Coliform Problems (USGS, 2004; ADEM, 2002**)**

Stream	Use Classification	Station #	Agency/ Study	# of Samples	Violations of Geometric Means Criteria	% of Samples >1000 mg/L, but < 2000 mg/L	% of Samples over 2000 mg/L
Coosa R @ AL/GA state line	PWS, S, F&W	O2397530	USGS	136	N/A	6%	10%
Mud Creek		MUDC-10	ADEM	12	250 mg/L (5/14/2002-6/6/2002)	8%	0
Spring Creek		SPRC-1	ADEM	14	327 mg/L (7/8/2002-7/30/2002)	0	0

B. Human Health Threats

1. Elevated counts of pathogenic bacteria

Fecal contamination in waterbodies can lead to several water quality problems. It is difficult to distinguish the sources of fecal contamination in waterbodies that receive a mix of agricultural and human waste. However, once sources are identified, management measures can be installed to effectively control the causes and sources. This is especially important when implementing TMDLs.

In addition to the documented bacteriological problems within the Upper Coosa, undocumented problems are suspected. According to NRCS County Soil Surveys (USDA-NRCS (Formerly SCS), 1958-1985), many watersheds in the Upper Coosa River Basin have severe soil types that make adequate on-site wastewater treatment difficult if not impossible. In addition, the 1998 Watershed Assessments completed by SWCDs (ASWCC, 1998), estimated that sewage treatment systems were inadequate or systems were failing throughout the basin (Table 3.5). Recreational lots located along Weiss Lake's shoreline are particularly vulnerable to these problems. In addition to fecal coliforms, nutrients such as nitrogen and phosphorus are present in both domestic and agricultural wastes.

Table 3.5
Estimates of Septic Treatment Systems for Counties in the Upper Coosa River Basin (ADPH, October 2002 and U.S. Bureau of the Census: State & County QuickFacts, July 2002)

County	Housing Units [1] (per 2000 Census)	Housing Units Not On Sewer (estimated) [1]	% Failing OSS (estimated) [1] [2] [3]	% With Inadequate Sewage Disposal (estimated) [1] [4]
Calhoun	51,322	37,000	3	2
Cleburne	6,189	5,500	5	20
Cherokee	14,025	12,000	35	N/A

1. Information obtained from the U.S. Bureau of the Census.
2. Information obtained from the local Department of Public Health.
3. Failing onsite sewage (OSS) treatment system refers to a septic tank or alternative system that is currently malfunctioning, or has malfunctioned and has not been repaired within the last 12 months.
4. Inadequate sewage disposal means a household with no septic tank system; and includes those with direct surface, ditch or stream discharge, and those with substandard solid treatments. Collection system may include a cesspool, barrel or drum, or other "homemade" sewage holding container.

Further investigation is needed to determine the sources and magnitude of the bacteriological problems in the Upper Coosa Basin.

2. Evidence of Fish Contamination

Polychlorinated Biphenyl's (PCBs) in Coosa River fish were first detected in the early 1970s. In 1976, the EPA identified General Electric as a source of PCBs entering the Coosa River. Fish consumption advisory signs were posted along the Coosa River, but were all but forgotten until the late 1980s when ADEM again confirmed high PCB levels in Coosa River fish, thereby prompting the ADPH to issue another fish advisory.

In 1991, ADEM, in cooperation with Alabama Department of Public Health, Alabama Department of Conservation and Natural Resources and the Tennessee Valley Authority initiated a Fish Tissue Monitoring Program for Alabama rivers and streams. This program monitors fish tissue throughout the State for bioaccumulative contaminants that may pose a risk to human health. The 2002 Fish Tissue Results (ADEM, 2002) indicated PCB levels exceeded FDA guideline of two parts per million (ppm) in composite samples of catfish found in the Weiss river section of the Coosa. A limited consumption advisory was issued for catfish weighing greater than one pound caught between the Georgia state line and Weiss dam. Limited consumption means women of reproductive age and children less than 15 years old should avoid eating the designated species of fish from these areas. Others should limit their consumption to one meal per month (ADPH, 2002).

3. Contamination of Public Water Supplies

Pollution poses a threat for the approximately 5,000 Upper Coosa residents dependent on surface water for their drinking water supply. Municipal treatment plants adequately treat raw water supplies for drinking water. However, the risk and costs to treat drinking water is greatly minimized if the source water, prior to treatment, is relatively clean.

Algal blooms are often a serious problem for municipal water suppliers. Algae can cause taste and odor problems, even in finished products. In addition, excessive algae may contribute to the formation of trihalomethanes (THMs). THMs are a group of four chemicals that are formed when chlorine or other water disinfectants react with natural organic matter (like decaying algae) in source water. Effective December 2001, the EPA established a maximum contaminant level of THMs at 80 ug/L in finished drinking water of large surface-water, public water systems. The standard became effective for small surface water and groundwater systems in December 2003 (EPA, August 2002). In addition to health concerns associated with THMs, water treatment costs have also increased to meet other EPA drinking water quality standards.

4. Incidences of Illegal Dumps, Debris and Litter

Litter is one of the most obvious and aesthetically objectionable pollution problems. Litter and debris may clog water intake pipes, harbor pathogens, or consist of toxic contaminants such as medical waste and chemicals (EARPDC 2001). Although some litter is directly deposited into waterways, the majority of debris is carried from roadside ditches and parking areas to surface waters by stormwater runoff. There are also numerous illegal dumps located throughout the river basin particularly in rural areas. Dumping is encouraged by the absence of county ordinances requiring proper household garbage disposal for citizens residing outside of the city limits.

The Weiss Lake Improvement Association sponsors an annual cleanup event for Weiss Lake. Their efforts resulted in 23.1 tons of debris collected in 2003.

C. Loss of Indigenous Plant and Animal Species

1. Habitat Fragmentation

Many species are threatened or endangered by habitat fragmentation or isolation of breeding populations. Fragmentation is a key factor in loss of biodiversity. Man-made structures such as dams, locks, levees, and other channel modification projects significantly impact aquatic habitats. Although Weiss Lake has viable biological and economical resources, the dam that forms it has greatly altered the natural ecosystem of the Coosa River mainstem. This is especially true of the "Dead River" section of the Coosa River, which was cut off from the mainstem river when the spillway dam was created.

Urban sprawl may further divide undisturbed habitat resulting in loss of large areas needed by wide-ranging species for food, cover and migration. Loss of habitat for one species may have a ripple effect throughout the ecosystem on other species. Urban development and planning decisions (e.g., new subdivisions, malls, roads, etc.) in the Upper Coosa River Basin should consider how sprawl and development may fragment or isolate populations, reduce habitat, and threaten species survival. The challenge for stakeholders in the Upper Coosa River Basin is to find an acceptable balance that preserves economic and ecological concerns.

This management plan supports an ecoregional-based approach to address habitat fragmentation and to protect biological diversity. Ecoregions are areas of general similarity in ecosystem and environmental resources. The ecoregional approach provides a way for basin stakeholders to address economical and ecological concerns, unrestricted by political boundaries. Coordination and involvement of the Clean Water Partnership is highly recommended.

2. Environmental Damage caused by Erosion and Sedimentation

Sediment is the most abundant pollutant in terms of quantity. Sedimentation occurs when rainfall erodes soil particles from the land, into water. Turbidity is the measure of suspended sediment in water. Turbidity causes a myriad of problems for aquatic species. For example, suspended sediment, especially particles from clayey soils may impede light penetration, influence temperature, affect feeding, hinder reproduction, clog gills, and smother eggs and nests.

In addition, soil particles may transport attached nutrients and toxins to receiving waters. Sedimentation can also reduce reservoir capacity, hinder recreational uses and increase the potential for flooding. Common sources of sediment in the Upper Coosa are rainfall runoff from croplands, construction sites, mining activities, and unpaved roads. Sedimentation may also be associated with timber harvesting and hauling roads.

Erosion, especially that associated with urban land disturbance activities, poses the greatest threat to water quality in the Upper Coosa Basin. Soil erosion is best addressed by implementing and maintaining best management practices according to state approved NPDES permit regulation guidelines.

According to the countywide Watershed Assessments conducted by Soil and Water Conservation Districts in 1998, eroding streambanks deliver the most sediment with an estimated 178,000 tons of sediment to Upper Coosa waters annually. The Calhoun County portion of Upper Terrapin Creek subwatershed contributed 120,000 tons of the total streambank erosion for the basin. Unpaved roads contribute an additional 175,000

tons of sediment annually to the Upper Coosa Basin. It is common for dirt roads to wash out during rain events, causing severe erosion problems, as well as maintenance issues. Clay particles from eroding dirt roads can remain in suspension for long periods of time and can contribute to increases in water turbidity, oxygen depletion,habitat modification and elevated water temperatures.

Upper Terrapin Creek and Bear Creek subwatersheds, deliver more sediment per acre (an estimated 3.3 tons/acre each) than any other subwatershed in the Upper Coosa. Estimated sedimentation rates and sources, detailed by subwatershed, are presented in Appendix 9.

3. Loss of Wildlife Habitat, Wetlands, and Forestlands

Wetlands play a vital role in the ecosystem and provide a variety of benefits for humans and wildlife. Wetlands act as a natural sponge; absorbing water during large rain events and releasing stored water during dry periods. Vegetation in wetlands act as filters to trap sediment and toxins, thus cleaning polluted water. Wetlands are also the primary nursing grounds for fish, shellfish, aquatic birds and animals. Many endangered animals and plants depend on them for survival (Botkin 1995).

It is presumed that a large number of wetlands have been inundated due to dam construction and the creation of Weiss Lake. Most of the remaining Upper Coosa wetlands are found along the Weiss Lake shorelines and along tributaries and old oxbows.

Imperviousness is a good indicator to analyze impacts of development on aquatic ecosystems. Studies have shown a correlation between the amount of impervious surfaces and changes in the hydrology, habitat structure, water quality and biodiversity of aquatic ecosystems such as lakes, reservoirs, and aquifers. Once a watershed's impervious cover exceeds 25%, a stream can no longer support a diverse stream community (Center for Wetland Protection, 1998). The Upper Coosa Watershed has less than 1% of its land area above the 25% imperviousness limit (EPA Urban Runoff Potential). Only 17 % of the 1,978 watersheds analyzed nationwide had 1% or more of its land exceeding this imperviousness threshold.

D. Other Environmental Concerns

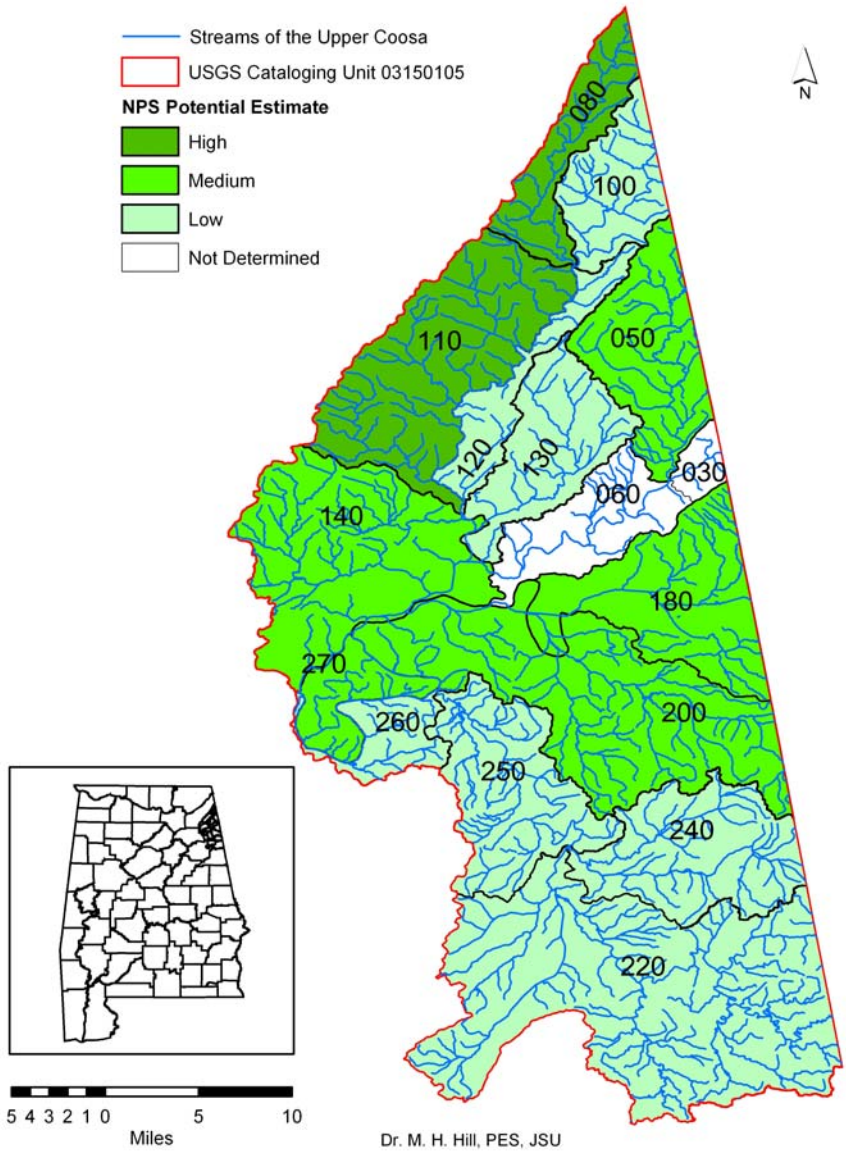
In 1998, the Soil and Water Conservation Districts in cooperation with NRCS and ADEM conducted locally-led Watershed Assessments for all 67 counties in Alabama. This assessment generated valuable environmental data for the Upper Coosa River Basin. Local citizens in each county were provided an opportunity to rank the top-five priority impaired subwatersheds based upon nonpoint source pollution potential. Five subwatersheds were ranked as "top-five" priorities in the Upper Coosa (Table 3.7). The countywide (District) watershed assessments are expected to be repeated in 2004 and continued every five years thereafter, contingent on Section 319 and other funding availability.

Table 3.6
Upper Coosa Subwatersheds Listed as Top-Five Priorities by the 1998 Locally-led Watershed Assessments (ASWCC, 1998).

HUC	Subwatershed Name	County	Rank
200	Spring Creek	Cherokee	1
250	Lower Terrapin Creek	Cherokee	2
50	Mills Creek	Cherokee	3
130	Spring Creek	Cherokee	4
220	Upper Terrapin Creek	Cherokee	5

During 2000, the Aquatic Assessment Unit (AAU) of the Field Operations Division of ADEM completed a basin-wide NPS Screening Assessment of the Coosa River Basin. The report indicates that the primary nonpoint source concerns within the Upper Coosa are forestry practices and runoff from row crops. A total of eight subwatersheds had a *moderate* or *high* potential for nonpoint source impairment. Thirteen of the subwatersheds had a *moderate* potential for impairment from urban and residential sources. Only one subwatershed ranked as *low* for impairment potential from both point and nonpoint sources (ADEM, 2002). Figure 3.3 depicts the nonpoint source impairment potential for each subwatershed in the Upper Coosa.

Figure 3.3 Estimates of NPS Impairment Potential for Subwatersheds of the Upper Coosa River



IV. MANAGEMENT PLAN IMPLEMENTATION

Goal

The goal of the Upper Coosa Watershed Project is to improve, protect and maintain the beneficial uses and water quality standards of the Upper Coosa River Basin through a basin-wide public/private partnership.

Objectives

The following objectives will be implemented to meet the above goal. The order of objectives is arbitrary and does not indicate any particular priority ranking:

1. Reduce pollution from agricultural activities
2. Reduce pollution from forestry activities
3. Reduce pollution from construction and other land disturbance activities
4. Reduce nonpoint source pollution from urban sources
5. Reduce pollution from domestic onsite sewage disposal systems (OSDS)
6. Prepare a joint comprehensive plan for Cherokee County and all incorporated cities to support future development needs and ensure effective stormwater management
7. Reduce pollutants generated by water-related recreational activities
8. Protect groundwater resources through conservation and pollution prevention
9. Promote wetlands, other critical area, and fish and wildlife habitat protection management measures
10. Inventory and monitor the physical, chemical and biological parameters for surface and groundwater
11. Assess the effectiveness of the Upper Coosa River Basin Management Plan and make adjustments to expeditiously achieve its goal and objectives
12. Increase citizen awareness for watershed protection, and develop long-term support and involvement of citizens for watershed planning and management.

The Goal and 12 Objectives were compiled from three existing Weiss Lake Management Plans. The strategies to achieve the objectives are based on water quality data, land use/land cover information, and best professional judgement of NRCS, SWCD, ADEM, GWW, and ACES professional staff. Management measures attempt to address, at a minimum, the pollutants for which TMDLs will be developed for waterbodies on the 1996 CWA Section 303(d) List of Impaired Waters. Management strategies promote a voluntary rather than a regulatory approach. A combination of education and outreach efforts and installation of on-the-ground BMPs will be used to expedite pollutant load reductions, improve, protect and maintain water quality, and ultimately lead to de-listing of Section 303(d) waterbodies in the Upper Coosa River Basin.

Measures and Indicators of Progress and Success

Table 4.1 provides *generic* measures and indicators that Upper Coosa River Basin stakeholders may use to assess the implementation success of this basin wide and future subwatershed management plans. It can be used to determine if pollutant loadings are being achieved over time and whether substantial progress is being made towards attaining water quality standards. Subwatershed projects may use other measures and indicators that are more relevant to stakeholder interest, watershed conditions, and needs.

Table 4.1 Measures and Indicators of Progress and Success

Water Quality Protection and Improvement

Number or percentage of river/stream miles and/or lake acres that fully support all designated beneficial uses
Number or percentage of river/stream miles and/or lake acres that come into compliance with designated uses or numeric water quality criteria
Improvement in relevant surface or groundwater chemical, physical, or biological water quality parameters
Lifting of fish consumption advisories
Reduction in number and severity of fish kills
Prevention of new impairments
Number, miles or area of waterbodies de-listed from the Section 303(d) List of Impaired Waters
Number, miles or area of waterbodies protected by proactive pollution prevention measures
Number, miles or area of waterbodies with management measures installed to protect Threatened & Endangered species
Priority sites cleaned and de-listed

Load Reductions

Estimated basin wide reductions in Nitrogen, Phosphorus, and sediment loadings (lbs. or %)
Estimated basin wide reduction in other point and NPS loadings
Offset of pollutant source loadings by reductions from other sources
Prevention or reduction in peak flows from runoff in developing or developed areas
Prevention or minimization of new loadings

Implementation of Pollution Controls

Number or types of best management practices implemented in impaired and threatened watersheds (annual progress)
Surveys of BMP use, maintenance and effectiveness
Number of approved or certified plans written to address pollutants of concern including erosion/sedimentation, stormwater runoff, nutrient management, pest management, etc.,
Percent or area of HUCs covered by watershed-based management plans
Implementation of management measures based on permit compliance
Garbage dumps and litter cleaned up
Pesticide cleanup days
Effectiveness of flood control management measures and reduction in flooding

Public Awareness and Attitude/Behavior Changes

Statistically based surveys of public awareness, knowledge, and action to measure changes in attitudes and behavior over time
Production/dissemination of literature and other information to stakeholders
Number of individuals and parties participating in Clean Water Partnership and resource agency sponsored environmental education and outreach seminars, meetings, conferences
Parties represented and number of stakeholders attending field days, tours, demonstrations, meetings, and conferences
Parties represented by and number of stakeholders serving on Clean Water Partnership committees and initiatives
Number of stakeholders participating in citizen volunteer monitoring
Stakeholders represented and participation in restoration activities
Number of watershed protection groups active throughout the basin
Number and types of BMP manuals, brochures, videos, databases, and other media used or produced to address basin water quality and natural resource protection issues and concerns

Strategies (Specific Actions To Be Taken)

Specific and measurable strategies are discussed below. Responsible parties and cooperators, potential funding sources, a schedule of implementation and success criteria are listed for each strategy. The strategies are listed as a series of steps needed to accomplish the overall objective. Responsible parties are agencies with regulatory or legal authority or other parties with an interest in development and implementation of this plan. Cooperators are those who could assist the responsible parties through shared resources and/or technical assistance. Potential funding identifies resources to implement the strategy. The schedule suggests implementation timelines on a quarterly schedule, with most of the strategies "ongoing" throughout the life of the project. Because of limited assessment data and the large area encompassed by the river basin, definitive load reduction estimates are unknown at this time. Most action items have intrinsic value (basic qualitative measures that will lead to water quality improvements), the Plan attempts to quantify load reductions. The CACs will continue to seek ways to quantify load reductions for strategies where none are listed. Budgets are estimates or unknown since implementation is dependent on funding and stakeholder interest and support.

The basin strategies are designed to achieve the Management Plan goal and objectives. Basin wide strategies presented below are not inclusive and may be modified to fit a particular subwatershed management problem. Action items may be deleted as strategies are accomplished, or added as partnerships and opportunities for cooperation evolve, new information becomes available or additional funds are obtained.

Objective 1: Reduce pollution from agricultural activities

Strategy:

a. Identify and prioritize agriculturally impaired subwatersheds
Discussion: Identification and targeting of priority watersheds will assure that public resources are used wisely, partnering opportunities are maximized; and environmental protection and economic benefits are realized within reasonable time frames. Priority watersheds will generally be prioritized based on the latest SWCD Watershed Assessments. Subwatersheds that include Section 303(d) listed waters, or have approved TMDLs, will also be ranked highest.
Responsible Parties: SWCC, SWCD, NRCS, ACES, ADEM
Cooperators: CWP and Facilitator, CAC
Potential Funding: 319 grant funds; state agricultural cost-share
Implementation Schedule: First quarter, 2005; Every five years thereafter
Load Reduction Estimates: TBD (To be determined)
Estimated Cost: $3,500/SWCD (county) Assessment (2005)

Action Items:
1. Convene and sustain advisory committees
2. Conduct county-wide Watershed Assessments
3. Compile and analyze data and information ongoing
4. Revise priority impaired subwatershed list
5. Disseminate lists and data to public (CWP; lead agency websites)

6. CWP promotes targeting of resources by the CWP to address priority impaired watersheds.

Progress and Success Criteria:
1. Number of locally led citizen advisory groups in each county
2. Update District (Countywide) Watershed Assessments every 5 years
3. Assessment Database Committee evaluates assessment needs and processes at least annually and input/revise statewide database information
4. Resource agencies use assessment information and data to prioritize annual funding and technical assistance to prioritized watersheds and issues

b. Involve the agricultural sector in management planning processes and activities throughout the Upper Coosa River Basin.

Discussion: Agricultural pollutants are a significant contributer to water quality problems in the Upper Coosa Basin. Basin management plan activities must be coordinated with the agricultural sector to assure landowner buy-in and to promote a "bottom-up" approach in decision-making processes. Efforts should be made to provide education resources and an understanding of the numerous conservation programs available.
Responsible Parties: NRCS, ACES, SWCC, RC&D, CWP and Facilitator
Cooperators: CWP and Facilitator, farmers, producer/commodity groups
Potential Funding: No additional funds necessary
Schedule: Ongoing, beginning First quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: No additional funding

Action Items:
1. Coordinate USDA-NRCS, SWCD and Section 319 funded management practices to address priority impaired watersheds
2. Promote connection between water quality protection and installation and maintenance of BMPs to landowners
3. Maintain effective lines of communication between agencies and landowners/users using basin wide and local watershed protection approaches

Progress and Success Criteria:
1. Agricultural sector representation on CWP committees and initiatives
2. Resource agencies target annual funding and technical assistance to prioritized watersheds and problem areas

c. Identify needs and install agricultural management practices

Discussion: Implementing agricultural management practices will significantly reduce erosion, sedimentation, and nutrient loading to the Upper Coosa River mainstem and its tributaries, and to Weiss Lake. Management practices can also protect drinking water supplies and groundwater quality; improve crop and pasture land quality and fertility; prevent some problems with flooding; enhance wetlands and fish and wildlife habitats; and support recreational activities. Management measures will be installed according to NRCS technical guidelines and standards.
Responsible Parties: USDA-NRCS/FSA; SWCD; RC&D; ACES, ADEM
Cooperators: Farmers; landowners; commodity producer groups; agriculture associations
Potential Funding: State Agricultural Cost Share; EQIP, CRP, Section 319
Schedule: Ongoing, beginning First quarter, 2005

Load Reduction Estimates: reduce erosion from agricultural lands to “T” or less; reduce Nitrogen and Phosphorus runoff per TMDLs developed for impaired waterbodies
Estimated Cost: See Appendix 10
Action Items:

1. Coordinate USDA-NRCS, SWCD and Section 319 and other funding mechanisms to implement management practices to address priority impaired watersheds (See Appendix 10)
2. Promote conservation easements to restore impaired waters or protect threatened waters
3. Coordinate implementation of management measures (e.g., types; site selection; timelines, maintenance; effectiveness monitoring)
4. Facilitate a combination of education and outreach efforts and installation of on-the-ground management practices to expedite agricultural pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:

1. Resource agencies cooperatively target annual funding, technical assistance, and technology transfer to prioritized watersheds and problem issues
2. Resource agencies report on implementation success and future needs
3. CWP and citizen advisory committees involved in decision-making processes
4. Miles or areas of waterbodies restored or delisted from the Section 303(d) list

d. Provide education and outreach

Discussion: Stakeholders must be provided with relevant and sound information. Efforts should be designed to provide education resources and an understanding of the numerous conservation programs and regulations that impact basin stakeholders.
Responsible Parties: CWP and Facilitator, ACES, ADEM, SWCD, RC&D, ADAI
Cooperators: Landowners, 4-H and FFA Clubs, Boy Scouts, environmental clubs and groups, schools and colleges, agricultural sector industries/businesses, Legacy, SWCS
Potential Funding: Legacy, producer groups and organizations, Section 319
Schedule: Ongoing, beginning First quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: $250,000 annually

Action Items:

1. Recognize outstanding farmers who implement effective management practices This reward for good stewardship will serve as an educational tool and incentive to other landowners. Acknowledgment may be river basin wide or watershed-specific The signs will feature the Clean Water Partnership logo and explain why the farmer is being recognized
2. Education of youth is essential for agriculture and long-term health of the basin. Establish proactive approaches to get youth involved in actual implementation of management practices. Promote student financial and education incentives
3. Develop/re-print and distribute management practices manuals and brochures, and develop videos, databases, and other media to address basin water quality and natural resource protection issues and concerns
4. Promote pollution prevention, reduction, and reuse programs
5. Provide erosion control, nutrient management, and other training and certifications
6. Promote conservation buffer, backyard conservation, wetland and groundwater protection, nutrient transfer, Farm*A*Syst, and other initiatives

7. Coordinate BMP demonstration projects on local farms to promote the understanding and adoption of agricultural BMPs
8. Maintain effective and timely lines of communication between urban/rural interface using a basin wide management approach

Progress and Success Criteria:
1. Number of farmers recognized for good stewardship
2. Number and types of programs/activities offered, and number of youth participating
3. Number and types of agricultural educational outreach materials produced and distributed
4. Number of farms with nutrient management plans, using litter hotline, alternative uses, or other pollution prevention measures
5. Number of farmers attending training opportunities or receiving certifications
6. Number of farmers participating
7. Farm/city weeks, fairs/festivals, workshops/conferences, talks/presentations, tours, news releases, and other urban/rural interaction opportunities promoted in each county

e. Coordinate Agricultural Pesticide Collection and Disposal Days.
Discussion: Proper use, mixing, application, storage, and disposal of agricultural pesticides and chemicals are paramount to protecting water quality and human and animal health. There are many benefits to using pesticides and chemicals to control pests and enhance production, however, improper use, storage, leaching, and spills can result in significant environmental consequences.
Responsible Parties: ADAI
Cooperators: CWP; ACES, ADEM, County solid waste management departments
Potential Funding: ADAI, Section 319, county, pesticide producers/sellers
Schedule: Annual or as facilitated by ADAI
Load Reduction Estimates: TBD
Estimated Cost: $75,000 annually

Action Items:
1. Establish pesticide collection events to collect and properly dispose of pesticides
2. Promote integrated pest management and precision farming techniques to eliminate or reduce the need for chemical applications
3. Provide pesticide use training and applicator certifications
4. Provide proper spill, clean-up and disposal training and outreach

Progress and Success Criteria:
1. Number of collection events scheduled; lbs. of chemicals properly eliminated
2. Acres incorporating IPM and precision farming (GIS/remote sensing technologies)
3. Number of applicators certified/re-certified
4. Number and types of education opportunities offered and number of stakeholders reached

Objective 2: Reduce pollution from forestry activities

Strategy:

a. Provide education and outreach to assist forest landowners in making informed forestry management decisions

Discussion: Education and outreach will promote stakeholder understanding, participation and partnerships – keys to long-term water quality and resource protection. Information delivery should use multiple media forms and be presented in user-friendly formats.
Responsible Parties: AFC, AFA
Cooperators: CWP and Facilitator, AU-School of Forestry, Alabama Loggers Council, consulting foresters, USDA, Pulp and Paper Industry
Potential Funding: AFC, AFA, Section 319, USDA, SWCD, Pulp and Paper Industry
Schedule: Ongoing, beginning First quarter,2005,
Load Reduction Estimates: Erosion from forestry activities <25% of "T" annually; TBD
Estimated Cost: $200,000 annually

Action Items:

1. Distribute education and outreach to private forest landowners to promote the interconnectedness between water quality protection and installation and maintenance of management practices. Seek new delivery methods, but continue to use practices that have worked in the past such as field days, demonstrations, tours, industry and association meetings, and on-site training
2. Encourage landowners to voluntarily install management practices according to the, *Alabama Best Management Practices Manual for Forestry*
3. Provide classroom and on-site training to loggers, haulers, and heavy machinery operators to promote the interconnectedness between water quality protection and installation of maintenance of management practices
4. Work with the forest industry to conduct BMP workshops and seminars for loggers, and public and private landowners
5. Identify and implement additional programs to publicly recognize and reward good forest management stewardship such as the Tree Farm Program, TREASURE Forest Program, Sustainable Forest Initiative, and the Professional Logger Management Program. Use as an educational tool or as an incentive to encourage other forest landowners to participate
6. Promote forestry as a solution to water quality degradation. Promote practices to address erosion and sedimentation, reforestation of abandoned mine lands, streamside management zones, perpetuation of healthy animal populations, habitat restoration, urban "heat sinks," shading and aesthetics
7. Facilitate a combination of education and outreach efforts and installation of on-the-ground management practices to expedite pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies
8. Maintain effective and timely lines of communication between agencies, forestland owners, environmental groups, and industrial sectors using a basin wide management approach

Progress and Success Criteria:

1. Number of workshops and seminars scheduled; and number of forestry sector stakeholders participating
2. Number of applicators certified/re-certified
3. Number and types of education opportunities offered and number of stakeholders reached
4. Land area (acre, miles) with ongoing pollution prevention and natural resource protection initiatives
5. Miles or areas of waterbodies incorporating forestry management measures that were restored or delisted from the Section 303(d) List

b. Encourage the adoption of a Notice of Timber Harvest ordinance for counties and/or municipalities within the basin.

Discussion: Poorly designed and constructed roads and skid trails can lead to erosion and can impact downstream water quality. A sixty-day notice before timber harvesting allows the Highway Department to work with loggers and assure the project site has properly designed roads and bridges. Poor or no treatment of logging debris and slash can cause fire, insect, and water quality problems. A Notice of Timber Harvest helps ensure compliance with EPA, ADEM, and local rules and regulations regarding timber cutting and water quality.
Responsible Parties: CAC, County Commissions, local municipalities
Cooperators: , Timber harvesters, AFC, ACES, NRCS
Potential Funding: Counties, local municipalities
Schedule: Ongoing, beginning First quarter, 2005,
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Develop and adopt ordinance requiring a sixty-day notice before timber harvesting projects begin
2. Inform local timber harvesting companies and landowners involved with forestry activities of new ordinance
3. Keep a detailed log or database of local timber harvesters and their compliance records

Progress and Success Criteria:
1. Notice of timber harvest ordinance is developed and implemented
2. Local timber harvesting companies and landowners involved with forestry activities are informed of new ordinance
3. Number of timber harvesters registered for harvest projects
4. Database of local timber harvesters is developed and maintained

c. Promote education and outreach to teachers and students

Discussion: Education of youth is essential for forestry and long-term health of the basin. A proactive approach to get youth involved in actual implementation of management practices is needed. Efforts that emphasize and deliver materials and opportunities for learning; teach and explore basic concepts; reexamine concepts that were once learned but forgotten; and efforts that reinforce and expand concepts that were learned but are not incorporated into daily life, is needed. The basic premise is – if people (especially students) hear about good forestry practices often enough, it will eventually become a natural part of their mindset and habits.
Responsible Parties: Project Coordinator, AFC, ACES, NRCS
Cooperators: FFA, landowners, 4H Club, local school districts
Potential Funding: Legacy, AFC, AFA, USDA Forest Service, Southern Group of State Foresters
Schedule: Ongoing, beginning First quarter, 2005,
Load Reduction Estimates: TBD
Estimated Cost: $50,000 annually

Action Items:
4. Distribute forestry education and outreach materials to K-12 teachers and students to promote the interconnectedness between water quality protection and installation and maintenance of management practices
5. Present programs to school FFA, 4-H, environmental clubs or other youth organizations
6. Promote and coordinate outreach activities around National Arbor Day or other designated forest awareness days
7. Promote FAWN, Project Learning Tree, and Project Wild programs in all counties

Progress and Success Criteria:
5. Number and types of presentations given and outreach materials provided
6. Number of programs presented and teachers/students participating
7. Parallel river basin forestry initiatives with statewide/national forest and tree awareness days
8. Number of stakeholders participating in special natural resource protection programs

d. Utilize the TREASURE Forest and Tree Farm programs to promote forest land stewardship

Discussion: A forest land stewardship ethic based on sound and sustainable management of forest resources for the benefit of the landowner and future generations is needed. The Alabama Forestry Commission's Timber, Recreation, Environment, Aesthetics, from a Sustainable Useable Resource program and the Alabama Forestry Association's Tree Farm System will assure that landowners manage their land in a balanced, ecologically based manner under a multiple use system.
Responsible Parties: AFC, AFA
Cooperators: Landowners
Potential Funding: AFC, AFA
Schedule: Ongoing, beginning Third quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: No new funding needed

Action Items:
1. Promote the TREASURE Forest and Tree Farm System programs to recognize citizens and landowners instituting exemplary forestry management measures and natural resource conservation practices. Provide public recognition and signage to identify outstanding sites
2. Encourage TREASURE participants to form an Alabama TREASURE Forest Association (AFTA) Chapter within the Upper Coosa

Progress and Success Criteria:
1. Number of TREASURE Forests and Tree Farm Systems recognized in each county in the basin
2. Establishment of AFTA Chapters in each county in the basin

Objective 3: Reduce pollution from construction and other land disturbance activities

Strategy:

a. Facilitate education and outreach programs for the construction industry

Discussion: Education and outreach to the construction industry will promote better understanding, participation and partnerships – keys to long-term water quality and resource protection. Information delivery should use multiple media forms and be presented in user-friendly, non-academic/citizen comprehensible and easily accessible formats.
Responsible Parties: Local homebuilders associations, ADEM,
Cooperators: County planning departments, HBAA, SWCS, ASWCC, NRCS, EPA, AACD, ALDOT, Associated General Contractors, RC&D Councils,
Potential Funding: EPA, county commissions, city governments, HBAA
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: $50,000 annually

Action Items:
1. Encourage implementation of pollution control measures using the Homebuilders Association of Alabama's Construction Stormwater Management Course
2. Present educational and outreach programs to local governments, builders and contractors
3. Provide workshops on erosion and sediment control in evening or weekend formats utilizing the interagency/NPDES permit stormwater handbook developed in partnership by NRCS, SWCC, Alabama Soil and Water Conservation Society and ADEM
4. Promote pollution prevention management measures using Business Partners for Clean Water, Nonpoint Source Education for Municipal Officials (NEMO), and other programs

Progress and Success Criteria:
1. Number of seminars conducted and number of stakeholders trained by the Homebuilders Association of Alabama's Construction Stormwater Management Course
2. Number of educational and outreach programs presented to local governments, builders and contractors
3. Number and type of programs and/or workshops conducted and stakeholders attending

b. Monitor all construction sites to insure compliance with EPA and ADEM rules and regulations and recognize developers and contractors who are implementing effective management measures on their sites.

Discussion: Land disturbance activities contribute to or accelerate pollutant runoff resulting in air, land and water quality problems. Programs are needed to publicly recognize and reward good stewardship and serve as an educational tool and incentive to other developers. Participants must be in compliance with all applicable environmental regulations and will be monitored periodically to ensure maintenance of practices.
Responsible Parties: ADEM, CWP, SWCDs, CAC
Cooperators: NRCS, area homebuilders assoc., area Board of Realtors
Potential Funding: 319 funding
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: No new funding needed

Action Items:
1. Provide signs and other forms of public recognition to developers and contractors implementing effective management measures. Acknowledgment may be river basin wide or watershed-specific. The signs will feature the Clean Water Partnership logo and explain why the deeper/contractor/site is being recognized
2. Keep a log or database of contractors' and developers' compliance records including warnings and citations

Progress and Success Criteria:
1. Number of developers and contractors participating
2. Number of sites recognized
3. Log or database of contractors' and developers' compliance records are developed and maintained

c. Identify and rank dirt roads that contribute most to stream sediment loads.

Discussion: Erosion and sedimentation from unpaved roads are a major contributor to water quality problems. Unpaved roads located near 303(d) listed streams will be given highest priority during the ranking process.
Responsible Parties: County commissions, CWP CAC
Cooperators: NRCS, SWCDs, county engineers, Soil and Water Conservation Society
Potential Funding: No additional funding needed
Schedule: Fourth quarter, 2005, and then on an "as needed" basis
Load Reduction Estimates: TBD
Estimated Cost: No new funding needed

Action Items:
1. Utilize SWCD and other county watershed assessments to identify subwatersheds most impaired by dirt road erosion
2. Prioritize dirt roads in each county for management practice implementation and coordinate with county commissioners
3. Promote the use of standardized criteria by county commissions and county engineers to rank sites for priority management practice implementation
4. Facilitate unpaved road management practices to roads located near Section 303(d) listed waterbodies
5. Promote a combination of education and outreach efforts and installation of on-the-ground management practices to expedite pollutant load reductions that will lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Use of SWCD and other county watershed assessments to identify priority subwatersheds most impaired by unpaved road erosion
2. Miles or segments of unpaved roads improved by management practices based on priority list
3. Use of standardized criteria by county commissions and county engineers to rank sites for priority management practice implementation
4. Miles or areas of waterbodies restored or delisted from the Section 303(d) list as a result of effective implementation of unpaved road management measures

d. Provide sediment and erosion control training for public works employees and others involved in building and maintaining roads.

Discussion: Management measures are needed to control polluted runoff from roads, highways, and bridges. Pollutant sources are generally site-specific and are affected by traffic volume, road design, land use, and accidental spills. Training and education should focus on implementation of a combination of structural and nonstructural management measures appropriate to the source, location, and pollutant of concern.
Responsible Parties: ADEM, County and municipal public works departments
Cooperators: County and municipal governments, ACES, ADEM, SWCD, ALDOT, SWCS, CWP and CAC committees
Potential Funding: 319 funding, ALDOT, county commissions
Schedule: Ongoing, beginning Second quarter 2005
Load Reduction Estimates: TBD
Estimated Cost: $50,000 annually

Action Items:
1. Conduct workshops and training seminars for the targeted groups
2. Utilize the publication, "*Recommended Practices Manual – A Guideline for Maintenance and Service of Unpaved Roads"* developed by the Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority
3. Encourage public works departments and developers to hire trained contractors
4. Enlist the SWCS to present erosion control management presentations or have a "train the trainers" session to equip others to do presentations

Progress and Success Criteria:
1. Workshops and training seminars are presented to targeted groups
2. "*Recommended Practices Manual – A Guideline for Maintenance and Service of Unpaved Roads"* developed by the Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority is made available to targeted groups
3. Trained contractors are hired within public works departments
4. Erosion control management presentations and/or "train the trainers" sessions have been presented to targeted groups

e. Develop countywide guidelines for erosion and sediment control

Discussion: Erosion and sedimentation is a serious problem throughout the basin. Since population growth and increased urbanization and sprawl are inevitable, municipalities and counties need to implement comprehensive guidelines to control erosion and sedimentation resulting from land disturbance activities. While it is recognized that land disturbance and building restrictions may increase the cost of construction, the cost of not addressing this problem may threaten air, land, and water resources, quality of life, and future economic development. Increased emphasis is needed in developing guides and implementing programs that focus on pollution prevention as the primary management measure.
Responsible Parties: CWP Facilitator and CAC
Cooperators: East Alabama Regional Planning Commission; county engineers, ADEM, ALDOT
Potential Funding: Planning commissions, local governments
Schedule: Ongoing, beginning second quarter 2005
Load Reduction Estimates: TBD
Estimated Cost: No new funding needed

Action Items:
1. Coordinate guideline development and delivery among county and municipal governments
2. Coordinate guidelines with Phase II Stormwater Program requirements
3. Promote citizen awareness of the need for erosion and sedimentation control measures. Incorporate Nonpoint Source Education for Municipal Officials (NEMO); Business Partners for Clean Water, Alabama Homebuilders Association, and other education and outreach programs
4. Promote the hiring of adequate number of staff for inspection and enforcement activities

Progress and Success Criteria:
1. Development of example guidelines that governmental parties can modify or adopt for local use
2. Number of citizens attending erosion and sedimentation education and outreach control programs
3. Number and types of education and outreach programs adopted by various governmental and watershed protection parties to address erosion and sedimentation
4. Number of counties with dedicated erosion control inspection staff and number of staff hired for inspection and enforcement activities

f. Provide education and outreach to landscape, nursery, and sod farm industries

Discussion: Businesses and river/lakeshore property owners commonly employ commercial landscapers. Since fertilizer and pesticide runoff are major contributors to pollution loadings, educating landscapers about ways to reduce this type of pollution is important.
Responsible Parties: CWP Facilitator and CAC
Cooperators: AU-Agriculture/Horticulture; ADEM, ACES, producer associations
Potential Funding: Section 319, producer associations
Schedule: First quarter, 2004, annually thereafter
Load Reduction Estimates: TBD
Estimated Cost: $50,000 annually

Action Items:
1. Conduct workshops and develop and distribute education and training materials that address pollutant concerns
2. Explore continuous education requirements with environmental protection components for producer business licenses
3. Facilitate a combination of education and outreach efforts and installation of on-the-ground management practices that expedite pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Number of workshops and outreach materials developed and distributed to targeted audiences
2. Implementation of continuous education requirements for producer business licenses
3. Miles or areas of waterbodies restored or delisted from the Section 303(d) List as a result of implementation of landscape, nursery, or sod farm management measures

Objective 4: Reduce nonpoint source pollution from urban sources

Strategy:

a. Implement urban management practices to protect water quality
Discussion: Urban runoff and impervious surfaces accelerate pollutant delivery to waterbodies. In addition, runoff increases flood flows and velocities, contributes to erosion, sedimentation, and degradation of water quality, overtaxes the carrying capacity of streams and storm sewers, greatly increases the costs of public facilities treating water, reduces groundwater recharge, and may threaten public health, welfare and safety. Management practices are needed to significantly reduce sediment, nutrient, and other urban runoff contaminants from entering Weiss Lake and its tributaries.
Responsible Parties: NRCS, ADEM, local governments/municipalities, ALDOT, local water works, EPA
Cooperators: CWP and Facilitator, CAC
Potential Funding: Section 319, local municipalities, EPA
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: Reduced sediment and nutrient runoff; TBD
Estimated Cost: Unknown

Action Items:
1. Facilitate basin wide management measures using an economically balanced program of education, technical assistance, financial incentives, research, and regulation
2. Provide a list of potential sites and timelines for installation of urban management practices in priority areas throughout the river basin
3. Encourage urban development in abandoned, idled, or under-used industrial and commercial facilities ("brownfields" development)
4. Facilitate a combination of education and outreach efforts and installation of on-the-ground management practices to expedite urban pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Potential sites identified and timelines established for installation of urban management practices in priority watersheds throughout the river basin
2. Return of brownfields sites to economically productive, environmentally conscious uses
3. Urban area education and outreach efforts and on-the-ground management practices implemented that expedite urban pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies
4. Miles or areas of waterbodies restored or delisted from the Section 303(d) list as a result of implementation of urban management measures

b. Coordinate urban management practice demonstration projects
Discussion: Demonstrations of management practices that promote public understanding and adoption of effective management measures by those involved in urban construction and land-clearing activities are needed.

Responsible Parties: CWP Facilitator and CAC
Cooperators: Landowners, SWCD, NRCS, ADEM, local governments, builders and homebuilders associations
Potential Funding: Section 319, local governments, builders and homebuilders associations
Schedule: Ongoing, beginning second quarter, 2006
Load Reduction Estimates: reduce erosion to "T"; reduce nutrients, chemicals, toxic and other polluted runoff; TBD
Estimated Cost: No new funding needed

Action Items:
1. Demonstrate on-the-ground management practices to reduce pollutant loadings that are environmentally protective and cost effective
2. Demonstrate management practices to reduce pollutant loadings that use best technologies available or that are new and innovative
3. Coordinate demonstration projects through resource agencies
4. Increase public awareness and understanding of urban environmental problems and issues

Progress and Success Criteria:
1. Replication of demonstrated management measures throughout the basin
2. Resource agencies coordinate human and financial capitol for demonstration projects
3. Number and type of Parties expressing interest in, touring, or implementing the management measure

c. Develop and distribute pollution prevention information packet to homeowners

Discussion: Households produce an assortment of pollutants from a variety of sources. As an efficient and effective way to mass-educate people about responsible homeownership, a homeowner's packet is needed that addresses the causes and sources of pollution and offers solutions. The packets may include information on maintaining septic systems, proper disposal of household wastes, water conservation, groundwater protection, lawn and gardening polluted runoff prevention tips, and lists of relevant agencies and phone numbers.
Responsible Parties: CWP and CAC committees, CWP Facilitator
Cooperators: Realtors association, utility companies, master gardeners, homebuilders association, county health departments, environmental groups, ADEM, ACES
Potential Funding: Section 319, utilities, realtors, homebuilders and developers
Schedule: Third quarter, 2007, then on an as needed basis
Load Reduction Estimates: TBD
Estimated Cost: $200,000 (2005); reprint cost, thereafter

Action Items:
1. Compile homeowner information packets
2. Distribute packets through local utility companies, realtor associations, Extension System offices, public health departments, or at meetings/conferences
3. Survey a select number of homeowners as to their interest in receiving the packets and resultant motivation to implement solutions

Progress and Success Criteria:
1. Number of packets delivered to homeowners
2. Number or percent of homeowners instituting pollution management measure presented in the packets

d. Provide environmental protection presentations to Home Owners/Boat Owners and other lake protection associations

Discussion: Home Owners/Boat Owners (HOBOs) and other lake protection associations have a keen interest in protecting the water quality and aesthetics of lake residential and recreational areas. When deposited in lakes and waterways, pollutants may impair water quality, discourage recreation uses, contaminate drinking water supplies, and interfere with habitat and survival of fish and other aquatic organisms and wildlife. In addition erosion and sedimentation problems may result in degraded shorelines, loss of reservoir storage capacity, increased flooding, and may impact boating and navigation. Education and outreach is needed to address lake resources, benefits and problems.
Responsible Parties: CWP and CAC committees
Cooperators: Weiss Lake Improvement Association, ADEM, ACES, AWW, APC
Potential Funding: Section 319, APC, Bass Anglers Society
Schedule: Fourth quarter, 2006, annually thereafter
Load Reduction Estimates: TBD
Estimated Cost: $20,000 annually

Action Items:
1. Utilize organized lake user and landowner groups to promote and implement components of the basin management plan and to provide information about the causes, sources and prevention of pollution
2. Maintain open, constructive, and timely dialogue to improve communication and to promote voluntary implementation of lake use and shoreline management measures
3. Promote the Alabama Water Watch citizen volunteer water quality-monitoring program

Progress and Success Criteria:
1. Number of groups and individuals involved in lake and shoreline protection efforts
2. Number or type of meetings conducted that address voluntary implementation of lake use, natural resource, and shoreline management measures
3. Number of lake groups and individuals involved in citizen volunteer water quality-monitoring

e. Promote Pesticide Collection Days to collect and properly dispose of hazardous pesticides and household chemicals

Discussion: Proper use, mixing, application, storage, and disposal of household use pesticides and chemicals are paramount to protecting water quality and human and animal health. There are benefits to using pesticides and chemicals in and around homes and yards to control pests and for fertilizing and treating lawns. However, improper use, storage, leaching, and spills can result in significant environmental consequences. Efforts are needed that focus on pollution prevention as a primary management measure.

Responsible Parties: ADAI
Cooperators: CWP and CAC Facilitator; ACES, ADEM, county solid waste management departments
Potential Funding: ADAI, Section 319, county governments, pesticide producers/sellers
Schedule: Annual or as facilitated by ADAI
Load Reduction Estimates: Reduced polluted runoff from residential areas; TBD
Estimated Cost: $350,000 annually

Action Items:
1. Establish collection events to collect and properly dispose of household hazardous chemicals and pesticides
2. Promote alternative non-hazardous household cleaning and pest control measures, and application of lawn and garden chemicals and fertilizers based on soil test
3. Provide proper spill, clean-up and disposal training and outreach

Progress and Success Criteria:
1. Number of collection events scheduled; lbs. of chemicals properly eliminated
2. Number and types of education opportunities offered and number of stakeholders reached

f. Promote the use of stormwater drain identification

Discussion: Stormwater runoff, or wet weather flows, is often collected by storm drains. This runoff often carries pollutants that are accumulated as it flows across impervious surfaces. In addition, many pollutants such as household chemicals, automobile maintenance products, lawn and garden by-products, and litter are carelessly released or improperly disposed of down storm drains. This pollution prevention and education management measure is a relatively inexpensive and is designed to encourage citizen interest and participation in protecting water quality. This activity uses stencils made out of Mylar, other plastic, or other durable materials with phrases such as “DUMP NO WASTE: DRAINS TO STREAMS.”
Responsible Parties: City and county governmental units, CWP and CAC committees
Cooperators: Girl Scouts, Boy Scouts, educators, students, civic and environmental groups
Potential Funding: Local governmental units, Section 319
Schedule: annual, sustain
Load Reduction Estimates: Reduced runoff of nutrients, pathogens, toxics and other pollutants to surface and groundwater
Estimated Cost: $3500 per two-week program

Action Items:
1. Provide stencils/markers and promote storm drain identification to school groups, scouts, and civic, environmental and other organizations. The use of stencils/markers can also be promoted through various news media
2. Apply markers or use stencils to paint water quality protection phrases on storm drain covers in residential and commercial areas. Stenciling may also be used on bridges in rural areas
3. Promote storm drain identification to reduce pollutant loads and that ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Stencils/markers provided and groups organized to use stencils/markers in all counties, especially Phase II stormwater permitted areas
2. Water quality protection phrases painted on storm drain covers in residential and commercial areas and on bridges in rural areas
3. Storm drain identification strategies implemented that reduce pollutant load amount and quantity, and ultimately lead to de-listing of Section 303(d) waterbodies

Objective 5: Reduce pollution from domestic onsite sewage disposal systems (OSDS)

Strategy:

a. Identify areas with significant impacts from inadequately treated sewage and wastewater

Discussion: Improperly treated domestic sewage harbors disease-causing viruses, bacteria and parasites, and is characterized by objectionable odor and appearance. The failure of traditional septic tank systems causes excessive amounts of raw or inadequately treated pollutants to degrade surface and groundwaters. As a septic system-siting requirement, soil evaluations should be conducted to determine the suitability of an absorption field in conjunction with percolation tests. Adequate treatment of domestic wastewater is needed to protect public health and the environment. A database for all permitted onsite systems is currently being used by county health departments. However, county environmentalists do not have time for program development, maintenance and trouble-shooting of GIS/GPS systems.
Responsible Parties: County health departments, ADPH, CWP Facilitator and CAC
Cooperators: Alabama Onsite Wastewater Association, SWCD, water authorities, county commissions, ADEM, JSU
Potential Funding: EPA Rural Hardship Assistance Program, Section 319, county commissions
Schedule: Ongoing, beginning third quarter, 2005
Load Reduction Estimates: Reduced nutrients and pathogens to surface and groundwater
Estimated Cost: $100,000/county assessment

Action Items:
1. Coordinate impaired sites and watershed identification efforts with the SWCD 5-year watershed assessment program
2. Assess all known water quality monitoring data to identify areas that are, or suspected to be, impaired by sewage runoff
3. Develop a list of priority impairment sites and timelines for installation of sewage management practices throughout the river basin
4. Assist health departments with program development, maintenance and trouble-shooting of the newly established county OSDS permits' GIS database and georeference system
5. Seek funding for additional GPS units—as well as training how to use them—for all county health departments within the Watershed
6. Promote antibiotic resistance, DNA analyses, and other detection methods to distinguish between human and animal coliform pollutant sources

7. Promote periodic water quality monitoring to identify impaired waters and to assess the effectiveness of management practices
8. Facilitate assessments to expedite sewage pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies
9. Grandfather all existing campgrounds in the Alabama Power Company easement, provided they are in compliance with health laws; new campgrounds or expansion of existing ones should be prohibited.

Progress and Success Criteria:
1. The SWCD Watershed Assessment database compiles sewage information a minimum of every 5 years
2. Water quality monitoring data collected to identify surface and groundwaters suspected to be impaired by sewage runoff
3. A list of priority impairment sites and timelines developed for installation of sewage management practices throughout the river basin
4. GIS technicians are acquired at the State and local levels, and county health departments have a better understanding of the OSDS database and georeference system
5. Adequate numbers of GPS units are acquired for county health departments within the Watershed
6. Programs in-place to distinguish between human and animal coliform pollutant sources
7. Water quality monitoring programs in-place to identify impaired waters and to assess the effectiveness of management practices
8. Miles or areas of waterbodies restored or delisted from the Section 303(d) List as a result of implementation of sewage treatment management practices
9. No net increase in the number of campsites located within the Alabama Power Company easement

b. Provide education and outreach to homeowners and businesses about proper septic tank siting, installation, operation and maintenance.

Discussion: Sewage treatment systems need to be designed, installed, and maintained to prevent the discharge of pollutants to surface and groundwaters. Consideration must be made relative to soil type, percolation, location, lot size, and distance to surface and groundwaters.
Responsible Parties: CWP Facilitator and CAC, ADPH/county health departments
Cooperators: CES, ADEM, RC&D, Alabama Septic Tank Association, county commissions, Alabama Onsite Wastewater Committee
Potential Funding: Legacy, ADPH, Section 319
Schedule: Ongoing, beginning second quarter, 2005
Load Reduction Estimates: Reduced nutrients and pathogens to surface and groundwater; TBD
Estimated Cost: $100,000 (2005), $60,000 annually thereafter

Action Items:
1. Coordinate, develop and distribute education, outreach, and training materials for workshops, public service announcements and other media
2. Coordinate and conduct basin wide education workshops for officials, developers, realtors, lenders, other citizens and schools
3. Facilitate a combination of education and outreach efforts and training to expedite sewage pollutant load reductions that lead to de-listing of Section 303(d) waterbodies

4. Coordinate OSDS initiatives with the Alabama On-site Sewage Training Center

Progress and Success Criteria:
1. Education and outreach and training materials for workshops, public service announcements and other media developed and distributed
2. Education workshops for officials, developers, realtors, financial institutions, other citizens and schools coordinated and conducted
3. Facilitation of a combination of education and outreach efforts and training to expedite sewage pollutant load reductions that lead to de-listing of Section 303(d) waterbodies
4. Basin wide OSDS initiatives coordinated with the Alabama On-site Sewage Training Center

c. Identify sources and provide cost-share funding and other incentives for septic tank maintenance and repair, and to address problems associated with residences, recreational sites and businesses with no provisions for septage or grease waste disposal.

Discussion: Inadequately designed and installed, non-existent, and failing OSDS pollutant discharges impair water quality and pose a threat to human health. Wastes from food service grease traps can also impair water quality. Some wastewater treatment plants do not accept septage pumped from septic tanks, some do not accept grease wastes, and some do not accept septage nor grease. Some pumpers find themselves in a position where they have no legal means to dispose of the wastes that they have pumped and received from local homes and businesses. Cost-share funding and incentives are needed to assure that wastewater is treated adequately to protect water quality and public health and improve the quality of life for basin stakeholders.
Responsible Parties: County commissions, city councils, city and county planning departments, city building departments
Cooperators: CWP and CAC, SWCD, Regional Planning Commissions, USDA-Rural Development, ADPH, RC&D, ADEM, county health departments, Alabama Septic Tank Association, system installers, home builders and contractors
Potential Funding: County governmental units, SWCD, USDA-Rural Development, septic tank pumper/installer fees, OSDS application fees
Schedule: Ongoing, beginning second quarter, 2005
Load Reduction Estimates: Reduced nutrients and pathogens to surface and groundwater
Estimated Cost: Unknown

Action Items:
1. Facilitate basin wide management measures using an environmentally protective and economically balanced program of education, technical assistance, research, and regulation
2. Provide a list of potential sites and timelines for installation of OSDS management practices in priority watersheds
3. Seek funding to provide financial incentives and as cost-share for septic tank pump-outs and free or reduced-cost maintenance of failing systems
4. Seek funding to address problems associated with residences with no provisions for on-site treatment
5. Explore countywide or municipal requirements and incentives for inspections, certifications, and upgrades of OSDSs before the sale or transfer of property
6. Explore a countywide requirement for electrical hookup to be contingent upon a valid sewage management system permit from the health department

7. Require owner of existing campgrounds to either show evidence of an approved sewage disposal system or file an application to construct a new system that will include camper/RV hookups and easy access to dumping stations
8. Require recreational lot and campground owners to subscribe to a regularly scheduled sewage removal service, or explore obtaining a county-held sewage removal contract whose service is charged to property owners
9. Explore the costs and benefits of extending municipality sewer lines to recreational lots and campgrounds along the Weiss Lake shoreline
10. Prohibit the use of onboard, or make-shift holding tanks along lakeshore easements
11. Require all campgrounds along lakeshores to construct a bathhouse with appropriate sewage disposal at a convenient location for guests
12. Promote the disposal of septage and grease wastes at public wastewater treatment facilities; and promote the upgrading of those facilities that currently are not adequately constructed to receive these wastes
13. Expedite digitized soil surveys
14. Increase local funding for hiring additional enforcement personnel within the county health department

Progress and Success Criteria:

1. Coordinated efforts facilitated for basin wide management measures using an environmentally protective and economically balanced program of education, technical assistance, research, and regulation
2. New or dedicated sources of funding identified or available to provide financial incentives and cost-share for septic tank pump-outs and free or reduced-cost maintenance of failing systems
3. A list of potential sites and timelines for installation of OSDS management practices in priority watersheds
4. Management practices implemented that expedite urban pollutant load reductions and ultimately lead to de-listing of Section 303(d) waterbodies
5. Miles or areas of waterbodies restored or delisted from the Section 303(d) list as a result of implementation of urban management measures
6. Countywide or municipal requirements and incentives for inspections, certifications, and upgrades of OSDSs adopted before the sale or transfer of property
7. Countywide requirements adopted for electrical hookup to be contingent upon a valid sewage management system permit from the health department
8. Countywide or municipal requirements and incentives are devised and implemented for inspections, certifications, and upgrades of OSDSs before the sale or transfer of property
9. Countywide requirements are enacted for electrical hookup to be contingent upon a valid sewage management system permit from the health department
10. Number of recreational lot and campground owners who subscribe to a regularly scheduled sewage removal service, or record of success for county-held sewage removal contract whose service is charged to property owners
11. Study of the costs and benefits of extending municipality sewer lines to recreational lots and campgrounds along the Weiss Lake shoreline has been compiled and analyzed
12. Use of onboard, or make-shift holding tanks along lakeshore easements has decreased
13. Number of campgrounds that have constructed bathhouses
14. Wastewater treatment facilities are upgraded to receive septage and grease wastes
15. Digitized soil surveys are made available for counties within the watershed

16. Additional enforcement personnel has been hired within the county health department

b. Promote the use of alternative onsite sewage treatment systems

Discussion: Some soils in the basin are not suitable for conventional septic tank systems. Sensitive areas, such as lakeshores, may have suitable soils, but high-density populations make traditional septic tank systems undesirable. Installing alternative OSDSs and decentralized systems should be encouraged as an option to septic tanks to treat wastewater. Alternative systems should be sited, designed, and installed so that impairments to surface and groundwaters will be reduced to the extent practical. Consideration should be provided to areas with poorly drained soils, shallow water tables or high seasonal water tables, nearness to wells and drinking water supplies, areas underlain by fractured bedrock that drains directly to groundwater, floodplains, topography, public health threats, and family size, housing density, and seasonal use.
Responsible Parties: CWP facilitator and CAC committee, ADPH, county health departments
Cooperators: Homebuilder associations, county engineers, planners, Alabama Onsite Wastewater Training Center, RC&D, alternative septic system designers, manufactures and installers
Potential Funding: County funds, SWCD, Section 319
Schedule: Ongoing, beginning third quarter, 2006
Load Reduction Estimates: Reduced nutrients and pathogens to surface and groundwater
Estimated Cost: Unknown

Action Items:

1. Encourage the use of decentralized OSDSs. Certified operators should perform installation, operation and maintenance
2. Encourage the use of alternative OSDS treatment technologies. Certified operators should perform installation and maintenance
3. Install alternative systems in areas where soil absorption systems will not provide adequate treatment of effluents containing phosphorus, nitrogen, pathogens and other pollutants
4. Promote alternative treatment systems to protect surface waters, groundwaters, wetlands, and floodplains
5. Promote pollution prevention, recycling, and composting as alternative sewage pollutant management measures
6. Provide a list of potential sites and timelines for installation of alternative and decentralized OSDS systems in priority watersheds
7. Expedite alternative and decentralized treatment systems to reduce pollutant load and ultimately lead to de-listing of Section 303(d) waterbodies
8. Work with engineers, county health departments, and the ADPH to streamline the approval process of alternative on-site treatment systems
9. Provide OSDS education and outreach
10. Provide incentives for alternative system implementation and proper maintenance
11. Promote county/local resolutions to promote decentralized wastewater treatment
12. Provide demonstration projects to promote the understanding and acceptance of alternative systems to public health officials, engineers, homebuilders, homeowners, etc.

Progress and Success Criteria:
1. Installation of decentralized OSDSs in areas not suitable for conventional septic tank systems
2. Installation of alternative OSDS treatment technologies in areas not suitable for conventional septic tank systems
3. Miles or areas of waterbodies restored or delisted from the Section 303(d) List as a result of implementation of OSDS management measures
4. Work with engineers, county health departments, and the ADPH to streamline the approval process for alternative on-site treatment systems
5. OSDS education and outreach promoted throughout the basin
6. Economic incentives identified or dedicated for alternative system implementation and maintenance
7. County/local resolutions adopted to promote decentralized wastewater treatment
8. Demonstration projects to promote the understanding and acceptance of alternative systems to public health officials, engineers, homebuilders, homeowners, etc. implemented

Objective 6: **Prepare a joint comprehensive plan for Cherokee County and all incorporated cities to support future development needs and ensure effective stormwater management** (Strategies a, b, and c are adapted from the Great Swamp Watershed Management Plan; F.X. Browne, Inc.)

Strategy:

a. Assess infrastructure and public services

Discussion: The extent and quality of infrastructure and public services reflect the basin's environmental protection and cultural values (e.g., recycling centers, hazardous waste disposal, garbage collection services, illegal dump and litter control, household and business energy conservation to reduce consumption of natural resources, greenways, etc.,). Surveys, research, and studies (e.g., roads and highways, waste disposal, public transportation, utilities, drinking water, bike/walking trails, parks and recreational areas, and sewage treatment, etc.) are needed to assess and plan for residential, commercial, and industrial development. Assessments should address strategies to balance growth and development with air, land, and water protection.
Responsible Parties: CWP Facilitator and CAC
Cooperators: EARPDC, ADECA, ALDOT, ADEM, RC&D, Legacy, planners, city and county governmental units, builders/contractors, academia
Potential Funding: CWP, ADECA, ALDOT, Legacy
Schedule: Begin First quarter, 2005; continue until project completion
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Appoint an "Infrastructure Planning Committee" for planning infrastructure requirements for Cherokee County
2. Conduct surveys, research, and studies to develop plans or documents that describe or assess the condition of infrastructure and adequacy of public services
3. Use results combined with demographic information to link population and economic growth with environmental protection and planning efforts, impacts on natural resources, and environmental justice issues
4. Prepare and Adopt building codes and zoning ordinances for all major growth areas

in the basin

Progress and Success Criteria:

1. Infrastructure committee is established and meeting regularly
2. Assessment of infrastructure and adequacy of public services conducted
3. Assessment results used to develop plans and strategies that balance population and economic growth to air, land, and water protection and environmental justice issues
4. Appropriate building codes and zoning ordinances are adopted and implemented for all major growth areas within the basin

b. Protect sensitive and critical areas and habitats

Discussion: Wetlands are among the most biologically productive natural ecosystems. Wetlands reduce flood damage by slowing and storing floodwaters, improve water quality by intercepting and retaining nutrients and sediments, and process organics. Poor communication, coordination and planning, urban sprawl and land uses, and inadequate funding contributes to assessment, classification, delineation and mapping deficiencies. A comprehensive wetland, sensitive/critical area, and habitat protection program for the basin is needed to address restoration and protection, education and outreach, conservation, regulation, and economics.

Responsible Parties: County commissions, planners

Cooperators: COE, ADEM, USDA, USFWS, Natural Heritage Program, Nature Conservancy, ADCNR, ALDOT, EPA, CWP and CAC committees

Potential Funding: County funds, USDA, COE, ADCNR, USFWS, ADEM, APC, EPA

Schedule: Ongoing, beginning second quarter, 2005

Load Reduction Estimates: Reduced runoff of nutrients, pathogens, toxics and other pollutants to surface and groundwater

Estimated Cost: Unknown

Action Items:

1. Inventory and geographically reference wetlands, threatened and endangered species, critical areas, and habitats throughout the river basin
2. Initiate a coordinated and cooperative stakeholder management plan to protect and conserve species of special concern
3. Promote land development measures and other activities that do not impair wetland form and functions
4. Promote a program to assure performance and accountability standards for mitigated wetlands
5. Promote a program to improve wetland protection through permit compliance, increased site inspections and enforcement
6. Identify and promote stable funding and protection of wetlands, and other biologically significant communities and natural habitats

Progress and Success Criteria:

1. Wetlands, threatened and endangered species, critical areas, and habitats throughout the river basin inventoried and geographically referenced
2. A coordinated and cooperative stakeholder management plan to protect and conserve species of special concern developed
3. Land disturbance and other activities implemented that do not impair wetland form and functions
4. A program to assure performance and accountability standards for mitigated wetlands instituted on a basin wide scale or in priority watersheds

5. Wetlands protected or improved through permit compliance, increased site inspections and enforcement
6. A stable source of funding identified to protect wetlands, and other biologically significant communities and natural habitats

c. Identify and map sensitive habitats, and develop a habitat protection and remediation prioritization ranking system.

Discussion: Sensitive ecosystems, critical areas and habitats protect the growth, survival and reproductive capacity of many and varied species throughout the basin. A map or GIS data layer of sensitive lands and other significant biological features in the Upper Coosa is needed.
Responsible Parties: Alabama Natural Heritage, FWS
Cooperators: ADCNR, ADEM, CWP and CAC Committees
Potential Funding: FWS, Section 319
Schedule: Second quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. The Alabama Natural Heritage will use the Nature Conservancy's Biological and Conservation Database (BCD) program as a primary information-managing tool to identify threatened and endangered flora and fauna
2. Coordinate efforts with the FWS, *Recovery Plan for Mobile River Basin Aquatic Ecosystem*
3. Assess general public knowledge about the natural resource aspects of the basin (native and exotic species and habitats, ecosystems, threatened and endangered species, or changes that have occurred over time, and what caused those changes)

Progress and Success Criteria:
1. Map or GIS data layer and other management tools of sensitive lands and other significant biological features in the Upper Coosa developed
2. Implementation of applicable components of the Upper Coosa Management Plan coordinated with the FWS, *Recovery Plan for Mobile River Basin Aquatic Ecosystem*
3. Citizen knowledge and perceptions about the natural resources are used in decision making processes, and encouraging participation in installing management practices

d. Assess the potential for regional stormwater management facilities

Discussion: Some municipalities currently require detention basins to control stormwater runoff before it enters the nearest waterbody. Typical stormwater basins are designed to control the peak rate of stormwater runoff, not the volume or quality. These basins can be retrofitted into stormwater wetlands, conventional wet ponds, or a combined wetlands-pond system. The modified stormwater management practices provide longer storage time and longer flow paths and biological treatment, thereby providing a pollutant treatment aspect. Application of regional stormwater facilities such as wet ponds and constructed wetlands should be evaluated. The economic, environmental and social aspects of developing regional facilities should be considered.
Responsible Parties: County and city governmental units
Cooperators: CWP and CAC committees; county engineers, city planners, ADPH
Potential Funding: County and city governments, Section 319
Schedule: Ongoing, beginning first quarter 2005

Load Reduction Estimates: Reduced runoff of nutrients, pathogens, toxics and other pollutants to surface and groundwater
Estimated Cost: $100,000 per pond per 100 acre drainage area

Action Items:
1. Evaluate the application of regional stormwater facilities such as wet ponds and constructed wetlands
2. Expedite implementation or retro-fitting of stormwater management systems to reduce pollutant loading amount and quantity, and ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Report prepared analyzing the application of regional stormwater facilities such as wet ponds and constructed wetlands
2. Implementation or retro-fitting of stormwater management systems that reduce pollutant load amount and quantity that ultimately leads to de-listing of Section 303(d) waterbodies
3. Miles or areas of waterbodies restored or delisted from the Section 303(d) list as a result of implementation or retro-fitting of stormwater management systems

e. Encourage municipalities to develop and implement enforceable stormwater management strategies to control both the quantity and quality of stormwater runoff.

Discussion: Stormwater management policies should be developed or updated to include provisions to reduce site runoff, maximize the use of natural drainage systems, and provide treatment to runoff before it enters receiving waters.
Responsible Parties: County and city governmental units
Cooperators: CWP and CAC committees, ADEM, county and city engineers, municipal water boards
Potential Funding: Unknown
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: Reduced runoff of nutrients, pathogens, toxics and other pollutants to surface and groundwater
Estimated Cost: Unknown

Action Items:
1. Provide the Nonpoint Source Education for Municipal Officials (NEMO) program to public officials
2. Develop a “tool box,” information packets, planning manuals, or generic land-use and planning regulation examples to assist local officials in developing effective stormwater policies and management plans
3. Expedite enforceable stormwater management strategies to reduce pollutant load and ultimately lead to de-listing of Section 303(d) waterbodies in the Upper Coosa River Basin

Progress and Success Criteria:
1. Number of programs presented and number of public officials attending NEMO
2. A “tool box” developed and updated as needed to assist decision-makers in developing effective stormwater policies and management plans

3. Effective stormwater policies and management plans developed
4. Enforceable stormwater management strategies implemented that reduce pollutant load amount and quantity, and ultimately lead to de-listing of Section 303(d) waterbodies
5. Miles or areas of waterbodies restored or delisted from the Section 303(d) list as a result of implementation of enforceable stormwater management strategies

f. Evaluate current and future impervious cover limits and encourage developments with minimal impervious surfaces.

Discussion: Urban development is a significant source of pollution. Urban development often converts vegetated, open, or forested areas to impervious surfaces and changes natural hydrology and hydraulics in response to site clearing and grading. Pollutant loadings in a watershed are directly related to the amount of impervious area. Impervious surfaces greatly increase runoff volumes and velocities to surface waters. Therefore, the best method of reducing runoff is to minimize the amount of impervious surfaces. A focus is needed on specific geographic areas, partnerships, and comprehensive plans to encourage appropriate and effective solutions to increases in impervious surfaces. Limitations or reductions in impervious areas should be balanced with the social and economic conditions and needs of basin residents.
Responsible Parties: CWP and CAC committees, city and county governments, planners
Cooperators: JSU, Ducks Unlimited, Alabama Natural Heritage, historical preservation societies, homebuilder associations
Potential Funding: Unknown
Schedule: Ongoing, beginning second quarter, 2005
Load Reduction Estimates: Reduced runoff of nutrients, pathogens, toxics and other pollutants to surface and groundwater
Estimated Cost: Unknown

Action Items:
1. Assess the extent of present and future impervious cover in subwatersheds throughout the river basin
2. Encourage future growth in subwatersheds that appear most capable of absorbing growth in impervious cover
3. Encourage and implement management practices such as smaller parking lots, narrower residential road widths, shorter driveways, cul-de-sacs with islands and open-space planning to minimize impervious surfaces
4. Promote open space to increase infiltration of stormwater to recharge groundwaters and to decrease the amount and velocity of stormwater runoff
5. Promote open space to provide wildlife habitat and recreational space in order to increase economic value.
6. For new subdivisions, encourage watershed stakeholders to identify potential conservation or open spaces lands, both primary (unbuildable) and secondary (prime agricultural, streams, wetlands, historic/cultural areas, sensitive areas, etc.,) and then locate housing or development sites accordingly
7. Expedite impervious surface strategies to reduce pollutant loads and ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. Assessments of present and future impervious cover completed for subwatersheds throughout the river basin
2. Management practices implemented that minimize impervious surfaces

3. Amount of open space set-aside or protected to increase infiltration of stormwater to recharge groundwaters and to decrease the amount and velocity of stormwater runoff
4. Amount of open space set-aside and protected to provide wildlife habitat and recreational space
5. Potential conservation or open-space lands, both primary (unbuildable) and secondary (prime agricultural, streams, wetlands, historic/cultural areas, sensitive areas, etc.,) identified
6. Impervious surface management strategies implemented that reduce pollutant load amount and quantity, and ultimately lead to de-listing of Section 303(d) waterbodies
7. Miles or areas of waterbodies restored or delisted from the Section 303(d) List as a result of implementation of impervious surface management strategies

Objective 7: Reduce pollutants generated by water-related recreational activities

Strategy:

a. Install boat pump-out facilities on Weiss Lake and provide education to boaters as to location and importance of use

Discussion: Install pump-out facilities at strategic locations along Weiss Lake. Provide a map of station locations within a boating informational brochure (see 7*b,* below). Place signs at launch areas directing boaters to nearest pump-out station.
Responsible Parties: ADEM, ADCNR, USFWS
Cooperators: ADCNR, ADPH, marinas, water works, APC, CWP and CAC Committees,
Potential Funding: USFWS Clean Vessel Act, ADEM, APC
Schedule: Annually, beginning second quarter, 2005
Load Reduction Estimates: Reduced runoff of nutrients and pathogens to surface waters
Estimated Cost: Unknown

Action Items:
1. Distribute education and outreach materials for marina owners and boaters illustrating the relationship between environmental protection and responsible recreational activities, Include information regarding the location and importance of using pump-out stations, litter issues, sensitive habitat information and other ways to apply safe and environmentally sound boating practices
2. Distribute education and outreach materials in a variety of places including boat marinas, the courthouse (where the boater's licenses are obtained), boat shows and tournaments, etc.
3. Install boat sewage pump-out facilities at all marinas in the Upper Coosa River Basin

Progress and Success Criteria:
1. Education materials for marina owners and boaters developed and distributed
2. Pumpout facilities established throughout the Upper Coosa River Basin

b. Promote lake clean-up days to include the tributaries and mainstem of the entire Upper Coosa River Basin.

Discussion: The Weiss Lake Improvement Association sponsors an annual lake/river cleanup for the Weiss Lake area. However, routine and coordinated clean-up efforts are needed throughout the entire Upper Coosa River Basin to protect water quality from pollutants and to improve aesthetics and water resource recreational use and value.

Responsible Parties: Weiss Lake Association, Home Owner, Boat Owner Associations
Cooperators: CWP and CAC, APC, ADEM, CRBI, local civic groups, girl/boy scouts
Potential Funding: Weiss Lake Improvement Association, APC, Section 319, governmental units
Schedule: Annually, beginning second quarter, 2005
Load Reduction Estimates: Reduced solid waste pollutants on waterways and along shorelines
Estimated Cost: Unknown

Action Items:
1. Expand annual cleanups to include tributaries and other waterways located within the Upper Coosa Basin
2. Increase number of participants in cleanup event
3. Initiate, or facilitate, cleanups in waterways upstream and downstream from the Upper Coosa, resulting in a system-wide cleanup for the entire Coosa River Basin

Progress and Success Criteria:
1. Existing annual lake cleanups expand to include tributaries and other Upper Coosa waterways
2. Increase in number of volunteers participating in cleanup events
3. Communities upstream and downstream of Weiss Lake initiate cleanups resulting in a system-wide cleanup for the entire Coosa River Basin
4. Reduction in the amount of litter and debris collected during annual cleanups

Objective 8: Protect groundwater resources through conservation and pollution prevention

Strategy:

a. Encourage communities using groundwater as a public water supply to become Groundwater Guardian Affiliates.

Discussion: Groundwater is often thought of as "out-of-sight – out of mind" – until wells go "dry" or become unfit for beneficial uses. Groundwater contamination may be very slow to dissipate and very expensive, difficult, or technically impossible to restore. Contaminate sources and causes may be difficult to ascertain, but a significant number of groundwater problems stem from man's landuse activities. Therefore, groundwater protection initiatives are needed to protect groundwater resources.
Responsible Parties: CWP and CAC Committees, ADAI, ADEM
Cooperators: Groundwater Guardian Program, CES, ADPH, GSA, USGS, AWW, Alabama Rural Water Association, Legacy
Potential Funding: ADEM, EPA, ADAI
Schedule: Ongoing, beginning second quarter 2006
Load Reduction Estimates: Reduced nutrients, pathogens, toxics and other pollutants to groundwaters
Estimated Cost: Unknown

Action Items:
1. Facilitate workshops, awards, and public recognition to support Groundwater Guardian designation in the Upper Coosa River Basin
2. Coordinate groundwater protection activities using an aquifer protection approach

3. Coordinate activities with municipalities and others that use groundwater as a drinking water source

Progress and Success Criteria:
1. Public recognition provided to parties for outstanding stewardship of groundwater resources
2. Groundwater protection measures implemented
3. Education and outreach provided so that municipalities and others using groundwater as a drinking water source understand the critical need to protect their drinking source water from contamination

b. Provide groundwater education and outreach

Discussion: The quality of groundwater in the Upper Coosa River Basin is good. However, as the population, industrial and economic growth of the river basin increases, so does the threat to groundwater quality. There is a need to increase public awareness about the status of groundwater (wells and springs) and its susceptibility to contamination.
Responsible Parties: CWP and CAC; ADEM
Cooperators: Academia, City and County Governmental Units, Water Boards, EPA, GSA, USGS, ADAI, ADPH, USDA, SWCDs
Potential Funding: City and County Government units, Water Boards, EPA grants
Schedule: Ongoing, beginning third quarter, 2005
Load Reduction Estimates: Reduced nutrients, pathogens, toxics and other pollutants to groundwaters
Estimated Cost: Unknown

Action Items:
1. Develop and distribute informational material highlighting the importance of water conservation and groundwater pollution prevention to homeowners
2. Facilitate Groundwater Festivals to student's throughout the Upper Coosa River Basin
3. Work with teachers to incorporate a groundwater protection component into classroom lesson plans
4. Facilitate basin wide capacity to educate larger and targeted audiences, generate greater stakeholder involvement, and minimize repetition or duplication of outreach activities
5. Institute a well closure program that addresses closure of abandoned and unused residential, irrigation, and industrials wells throughout the river basin
6. Coordinate basin wide education and outreach efforts with the EPA approved – ADEM Comprehensive State Groundwater Protection Program; Alabama Above Ground and Underground Storage Tank Trust Fund; the Alabama Underground Storage Tank and Wellhead Protection Act; ADEM Source Water Assessment Program; the GSA/ADEM aquifer vulnerability monitoring and reports, the ADAI State Pesticide Management Plan, ADPH Onsite Sewage Disposal System program; and the SWCD Watershed Assessments

Progress and Success Criteria:
1. Water conservation and groundwater pollution prevention materials developed and distributed to homeowners
2. Groundwater festivals initiated throughout the Upper Coosa River Basin

3. Teachers incorporate a groundwater protection component into classroom lesson plans
4. A holistic education and outreach plan developed to assure limited funds are used wisely
5. A well closure program instituted and coordinated with NRCS farm well abandonment and ADEM well development guidelines
6. Education and outreach coordinated with agency groundwater assessment, protection, and funding opportunities

c. Protect groundwater from polluted runoff

Discussion: In some rural areas, isolated dirt roads and sinkholes become illegal dumps for garbage and other waste materials. These places are eyesores and pose a threat to ground and surface water quality. Illegal dumps can also harbor insect and rodent populations that can transmit disease. Hazardous materials, dead animals, and other types of garbage placed in areas characterized by limestone aquifers and sinkholes are particularly susceptible to contamination.
Responsible Parties: County health departments, CWP and CAC, ADEM
Cooperators: County governmental units, water boards, SWCDs,
Potential Funding: County governmental units, ADEM
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: Reduced nutrients, pathogens, pesticides, toxics and other pollutants to groundwaters
Estimated Cost: Unknown

Action Items:

1. Use water quality monitoring, land use assessments, geology, hydrology, etc., to identify the potential sources of contamination of aquifers underlying the basin
2. Develop and input data and information into a comprehensive groundwater protection database
3. Determine re-charge areas of public water supply wells and springs and make data known to groundwater users
4. Analyze the current and future impacts to groundwater use
5. Coordinate pollution prevention efforts and remediation of contaminated sites

Progress and Success Criteria:

1. Implementation of programs to determine the potential sources of contamination to aquifers underlying the basin
2. A comprehensive groundwater protection database is developed or used to assess river basin/aquifer protection data
3. Groundwater users are provided information to help them protect their groundwater sources
4. Management practice decisions consider both groundwater quality protection and economic sustainability
5. Management measures are coordinated between resource agencies to assure efficient clean-up and to prevent duplication of effort at contaminated sites

Objective 9: Promote wetlands, other critical area, and fish and wildlife habitat protection management measures

Strategy:

a. Identify subwatersheds with significant habitat restoration needs and rank valuable parcels for acquisition or other forms of protection.

Discussion: Habitat restoration efforts remain fragmented and incomplete. More and better stakeholder communication, planning, and coordination is needed to identify, assess, and prioritize habitat areas in need of restoration or acquisition.
Responsible Parties: CWP and CAC Committees
Cooperators: ADCNR, FWS, NRCS, ADEM, Alabama Natural Heritage Program
Potential Funding: FWS, ADCNR, NRCS, Section 319
Schedule: Ongoing, beginning fourth quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Develop interagency consensus of basin wide ecological indicators to be used to identify valuable habitats
2. Examine aerial photographs to identify subwatersheds with significant habitat loss
3. Identify possible areas for restoration based on their benefits for fish and wildlife and/or to mitigate water quality impairments from land use activities
4. Prioritize areas for habitat restoration and protection
5. Submit potential sites for acquisition to ADCNR – Forever Wild Program; NRCS for conservation easements; or city/county governments as “open-space” protection, etc.,
6. Develop a report and map to justify priority rankings and distribute to stakeholders

Progress and Success Criteria:
1. A set of basin wide ecological indicators are used to identify valuable habitats
2. Aerial photographs are obtained and analyzed to identify subwatersheds with significant habitat loss
3. Areas most in need of restoration and protection are identified and prioritized
4. Land area and habitat acres acquired or protected for future generations
5. Stakeholders are provided reports and maps of priority areas

b. Identify sources and provide cost-share and other incentives to landowners for habitat restoration and protection.

Discussion: Many landowners are not aware that programs are available to protect and restore habitat, or do not rank habitat protection as a management priority. Education and outreach is needed to reach audiences that can provide for habitat restoration and protection needs.
Responsible Parties: CWP and CAC committees
Cooperators: USDA, FWS, ADEM
Potential Funding: USDA, FWS, Section 319
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action items:
1. Resource agencies inform landowners of the availability of Federal cost-share assistance and incentives for habitat protection
2. Use Federal programs such as the Environmental Quality Incentives Program (EQUIP), Wetlands Reserve Program (WRP), Conservation Reserve Program (CRP), Wildlife Habitat Incentives Program (WHIP), and the F&WS – Partners for Wildlife to protect and restore habitat
3. Develop and provide education and outreach materials, workshops and press releases
4. Identify and pursue other public and private funding sources for landowner cost-share and incentives

Progress and Success Criteria:
1. Landowners are provided with education and outreach materials, workshops and press releases
2. Public and private funding sources for landowner cost-share and incentives are identified and used to restore or protect habitats in the river basin
3. Amount of habitat restored/protected

c. Provide information to river basin residents on tax incentives and other benefits that can be achieved through the use of conservation easements and other land protection programs.

Discussion: As greater developmental pressure is placed on the basin's dwindling natural resources, environmentally protective and economically protective incentives for landowners is needed. Conservation easements and other land protection set-aside programs can provide a balance between environmental and economic benefits. Incentives to landowners may include quality of life and positive public opinion issues.
Responsible Parties: CWP and CAC committees
Cooperators: FWS, Legacy, Ducks Unlimited, Nature Conservancy, Trust for Public Land, Land Trust Alliance, Forever Wild, SWCDs, Alabama Forest Resources Center, Alabama Land Trust
Potential Funding: Land Trust Alliance, Alabama Forest Resources Center
Schedule: Ongoing, beginning third quarter, 2006
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action items:
1. Seek to acquire sensitive areas through organizations such as Ducks Unlimited, The Nature Conservancy, etc.,
2. Provide outreach opportunities for the general public to discuss conservation easements and other land protection strategies
3. Explore the possibility of establishing land trust organizations

Progress and Success Criteria:
1. Sensitive areas acquired (sq. miles, acres, segments, etc.) through organizations such as Ducks Unlimited, The Nature Conservancy, etc.
2. Opportunities provided for basin stakeholders to discuss conservation easements and other land protection strategies
3. Land trust organizational potential explored or established

d. Review COE permit applications for bulkhead, wetland filling and dredging permits in the Upper Coosa River Basin

Discussion: Activities that result or may result in a discharge to navigable waters must obtain a CWA Section 404 permit from the COE and a Section 401 state water quality standards certification from ADEM. Stakeholders need to take an active role in ensuring that permitted activities that may result in a discharge do not violate water quality standards.
Responsible Parties: CWP and CAC committees, COE
Cooperators: ADEM
Potential Funding: Unknown
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: Reduced sediment and pollutant transport
Estimated Cost: Unknown

Action items:
1. Review COE permit applications for the Upper Coosa River Basin (COE-Mobile District)
2. Provide comments as applicable during the public comment period on all permits where activities may degrade water quality.

Progress and Success Criterion:
1. Number of COE permit applications reviewed and commented on

e. Participate and provide input into the Federal Energy Regulatory Commission's (FERC) re-licensing process for Alabama Power Company's Coosa River hydroelectric dams.

Discussion: Alabama Power Company owns and operates Weiss Dam which influences the environment and economy of the Upper Coosa River Basin. The current FERC license for the management of these dams expires in 2007. An important part of the re-licensing process is public participation. The FERC is required to consider not only the power generation of a river, but also energy conservation, protection of fish and wildlife, protection of recreational opportunities, and preservation of other environmental quality aspects. Once a license is re-issued, stipulations are applicable for the next 30-50 years. Input is needed from Coosa River stakeholders since this process will affect quality of life for many years.
Responsible Parties: APC, CWP and CAC committee
Cooperators: All river basin stakeholders
Potential Funding: No funding needed
Schedule: Ongoing, beginning first quarter, 2005(until FERC approval/disapproval)
Load Reduction Estimates: TBD
Estimated Cost: No funding needed

Action item:
1. Stakeholders address dam operations to safeguard the survival of threatened and endangered species through improved downstream flows, protection of water quality, protection of lands and tributaries, and stabilization of reservoir levels

Progress and Success Criterion:
1. Stakeholder comments provided to FERC for dam re-licensing consideration

Objective 10: Inventory and monitor the physical, chemical and biological parameters for surface and groundwater

Strategy:

a. Identify and prioritize environmental data and information needed to improve basin plan implementation effectiveness

Discussion: As the management plan is developed and implemented, new information will most likely emerge. Additional Upper Coosa River basin data and information is needed to help stakeholders protect public health and welfare, water quality, aquatic and upland species, and enhance of recreational benefits. A coordinated monitoring approach is needed to collect environmental data and information for planning; decision making; management practice implementation; developing indicators, status and trends, and measuring success. Extensive stakeholder participation and consensus should be used to determine assessment processes and implementation prioritization.
Responsible Parties: CWP and CAC committees
Cooperators: ADEM, GSA, USGS, academia, city and county governmental units, water boards, industry, municipalities
Potential Funding: ADEM, GSA, USGS
Schedule: Fourth quarter, 2005, then update as needed
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action items:
1. The CWP Facilitator will routinely identify additional data and information needs and develop funding proposals useful to implementing management plan strategies
2. Coordinate monitoring and assessment activities to prevent duplication of efforts
3. Use scientifically based data and information to establish priorities
4. Compare improvements and ecological status and trends using least impaired reference station data

Progress and Success Criteria:
1. The need for additional data and information is routinely identified and funding sources sought and acquired
2. Monitoring and assessment activities coordinated among resource agencies and other stakeholders
3. Scientifically based data and information is used to establish management practice priorities
4. Improvements and ecological status and trends compared to least impaired reference station data

b. Continue to support and expand the Alabama Water Watch citizens volunteer water quality monitoring program

Discussion: Citizens are encouraged to be involved in the ecological, socioeconomic, and political aspects of the river basin. The AWW program is an excellent way to involve stakeholders and provide citizens an opportunity to be globally aware and locally active in environmental monitoring and decision making processes. The water quality data that

citizens collect provides valuable information, but the knowledge and experience citizens gain in doing so can be a major factor leading to better water quality and water policy.
Responsible Parties: AWW, Weiss Lake Improvement Association, CRBI
Cooperators: CWP and CAC committees, schools, environmental protection groups, AWWA, watchdog groups, AARP, League of Woman Voter's, Scouts, church groups
Potential Funding: AWW, ADEM
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Maintain interest and increase citizen volunteer water quality monitoring throughout the river basin
2. Conduct AWW basic and bacteriological certification workshops
3. Present Advanced Workshops for biological (bacteria and macroinvertebrate) monitoring
4. Compare pre- and post-BMP implementation AWW data to assess improvements, on water quality in the basin
5. Encourage teachers and students to get involved in volunteer water quality monitoring
6. Involve and coordinate management plan implementation with other volunteer activities such as watchdog groups, AARP, League of Woman Voter's, Scouts, church groups, and others with an interest or that report environmental problems
7. Focus volunteer monitoring on Section 303(d) listed waterbodies
8. Concentrate on other impaired and unimpaired waterbodies, especially where on-the-ground management practices have been installed

Progress and Success Criteria:
1. Citizens volunteering to monitor water quality throughout the basin
2. Certification workshops presented
3. AWW data used to assess improvements in water quality
4. Teachers and students trained to collect monitoring data
5. Coordination with volunteer groups
6. Volunteer monitoring data collected on Section 303(d) listed waterbodies
7. Volunteer monitoring data collected on other impaired and unimpaired waterbodies

c. Partner with Jacksonville State University (JSU) and other colleges or universities to collect and analyze water quality data.

Discussion: Technical expertise and research interest is critical to implementation. Higher education institutions can provide scientist and academic researchers and expertise. These professionals need to be involved in planning, collection and analyses of environmental data, and implementation.
Responsible Parties: CWP and CAC committees
Cooperator: ADEM, JSU, other colleges and universities, instructors, students, science clubs
Potential Funding: JSU, Legacy
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Promote the Upper Coosa River Basin Management Plan to colleges and universities
2. Seek and encourage research projects that include environmental data collection
3. Encourage instructors to incorporate applicable components of the Upper Coosa Management Plan into their coursework and labs

Progress and Success Criteria:
1. The Upper Coosa River Basin Management Plan promoted in colleges and universities
2. Colleges and universities include Upper Coosa environmental data collection as part of coursework/labs

d. Input broad-based river basin and subwatershed-specific data into water quality databases

Discussion: Easily accessible and user-friendly data and information depository and retrieval systems are needed to better identify and assess Upper Coosa River Basin problems and to develop solutions.
Responsible Parties: Coosa River Basin Clean Water Partnership (CWP), and Citizen Advisory Committee (CAC)
Cooperators: CWP, ADEM
Potential Funding: CWP, ADEM
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Coordinate Upper Coosa River Basin data with the statewide Clean Water Partnership database and reporting efforts (www.cleanwaterpartnership.org)
2. Present basin wide monitoring data and information in an easily accessible and user-friendly database
3. Maintain a library of Upper Coosa River Basin data, including water quality studies and research reports
4. Use compiled data to assess Section 303(d) listed waters (i.e., determine when data was collected, frequency of data collection, improvement in water quality, possible de-listing of waterbodies, etc.)

Progress and Success Criteria
1. Upper Coosa River Basin data collections coordinated with the statewide Clean Water Partnership database and reporting efforts
2. Basin wide monitoring and other data is presented in an easily accessible and user-friendly database
3. A library of Upper Coosa River Basin studies and reports is maintained
4. Data used to assess Section 303(d) listed waters is compiled

Objective 11: Assess the effectiveness of the Upper Coosa River Basin Management Plan and make strategy adjustments to expeditiously achieve the goal and objectives

Strategy:

b. Hire an Upper Coosa Basin Coordinator to facilitate watershed activities and implement the Basin Management Plan.

Discussion: A paid, full-time basin coordinator is necessary to ensure implementation of the Management Plan and serve as a Clean Water Partnership liaison for the Upper Coosa Basin. This person would be responsible for the daily coordination of basin activities such as responding to citizen inquiries, coordinating public agency efforts, facilitating watershed improvement projects, implementing BMPs, assisting in monitoring programs, providing education opportunities for watershed residents, and grant-writing.
Responsible Parties: CWP, CAC
Cooperators: county and municipal government
Potential Funding: County and municipalities, 319, grants
Schedule: Annually, beginning first quarter, 2005
Load Reduction Estimates: N/A
Estimated Cost: $40,000; annually

Action Items:
1. Advertise, and hire, a full-time Watershed Project Coordinator

Progress and Success Criteria:
1. A full-time, paid Watershed Project Coordinator is acquired.

c. Review Management Plan at least annually and update as necessary.

Discussion: Some states have been implementing management measures in small watersheds for many years before seeing any water quality improvement or significant successes. In some cases, even when all management measures have been implemented, they may not achieve water quality objectives within a specified timeframe. This management plan is a long-term commitment. Unity and partnering is a must. Momentum must be maintained, duplication must be eliminated, and success must be built upon. Therefore, frequent management plan reviews are necessary in order to assure that human and financial resources are used effectively and efficiently.
Responsible Parties: CWP Facilitator and CAC
Cooperators: All stakeholders
Potential Funding: No additional funding needed
Schedule: Annually, beginning fourth quarter, 2005
Load Reduction Estimates: Reduction in pollutants to all surface and groundwaters in the Upper Coosa River Basin, TBD
Estimated Cost: Unknown

Action Items:
2. Utilize long term surface and groundwater-monitoring results to evaluate the effectiveness of installed management measures
3. Provide ample opportunities for citizen input, review, and decision-making processes

Progress and Success Criteria:
2. Long-term surface and groundwater-monitoring results are used as a basis to evaluate the effectiveness of installed management measures
3. Opportunities for citizen input, review, and decision-making processes provided

d. Coordinate subwatershed protection plans and management practices throughout the Upper Coosa River Basin

Discussion: The Upper Coosa subwatersheds located within DeKalb and Cherokee counties have applied for and received Section 319 grant funding to implement some of the components of this river basin plan. However, additional resources and stakeholder coordination is needed to achieve the goal and objectives of this basin plan as expeditiously as possible.
Responsible Parties: CWP and CAC committees
Cooperators: ADEM, USDA, SWCD, RC&D, planners, city and county governmental units
Potential Funding: No additional funding needed.
Schedule: annual, sustain
Load Reduction Estimates: Reduction in pollutants to all surface and groundwaters in the Upper Coosa River Basin
Estimated Cost: Unknown

Action Items:
1. Utilize the CWP and CAC committees to implement components of this basin management plan in subwatersheds throughout the Upper Coosa River Basin
2. Coordinate human and financial capitol to achieve the goal and objectives presented in this management plan with subwatershed protection plans
3. Investigate and solicit co-funding, in-kind services, reduced rates, grants and private sources of funding to implement components of this plan

Progress and Success Criteria:
1. Strategies implemented as expeditiously as possible to meet applicable management plan goal and objectives
2. Resources coordinated to achieve management plan goal and objectives
3. Sources of funding solicited to implement components of this plan

e. Develop Total Maximum Daily Loads (TMDLs) and implement effective and efficient management measures

Discussion: TMDLs mandate a daily loading limit on specific point and nonpoint sources of pollutants. Strategies presented in this river basin plan will target TMDL sources and causes as a priority.
Responsible Parties: CWP and CAC Committees, ADEM
Cooperators: CWP Facilitator
Potential Funding: Unknown
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: Reduction in pollutants to all surface and groundwaters in the Upper Coosa River Basin
Estimated Cost: Unknown

Action items:
1. Establish Total Maximum Daily Loads (TMDLs) for all 1996 Section 303(d) listed waterbodies in the Upper Coosa River Basin by November 2004
2. Provide ADEM with data or other information that will be beneficial in the development of Upper Coosa River TMDLs
3. Encourage public participation throughout the TMDL development process, as well as written comments during the public comment period
4. Coordinate TMDL implementation plans with this basin management plan
5. Give higher priority to polluted waters that are a source of drinking waters or support threatened or endangered species

6. Target management practices to reduce pollutant loads and that ultimately lead to de-listing of Section 303(d) waterbodies

Progress and Success Criteria:
1. The CWP Facilitator and other partners provide ADEM with data or other information to develop Upper Coosa River TMDLs
2. Public provides input and comments into the TMDL development and approval process
3. TMDLs for all 1996 Section 303(d) listed waterbodies in the Upper Coosa River Basin developed by November 2004
4. TMDL implementation plans coordinated with or become addendum's to this Management Plan
5. Management practices installed on polluted waters that are a source of drinking waters or support threatened or endangered species
6. Management practices reduce pollutant loads and ultimately lead to de-listing of Section 303(d) waterbodies

f. Seek and secure funding opportunities to ensure project sustainability.
Discussion: Funding for further investigation and Management Plan implementation is vital to the success of the Upper Coosa Watershed Project. Private sources such as Alabama Power Company and others that are dependent on the water quality of Weiss Lake and its tributaries should be approached. Portions of increased revenues from taxing improvements on recreational lots, as described above, may also fund basin activities. Another way to raise money is to hold a benefit concert with well-known entertainers in the area.
Responsible Parties: CWP and CAC Committees, ADEM
Cooperators: CWP Facilitator
Potential Funding: Unknown
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBA
Estimated Cost: Unknown

Action items:
1. Create a yearly budget dependent upon the Plan's implementation schedule
2. Secure enough funding to implement the Plan's Strategies and Objectives

Progress and Success Criteria:
1. A yearly budget dependent upon the Plan's implementation schedule is created
2. Funding to implement the Plan's Strategies and Objectives is identified and secured

Objective 12: Increase citizen awareness for watershed protection, and develop long-term support and involvement of citizens for watershed planning and management

Strategy:

a. Coordinate implementation of this basin Management Plan with the Clean Water Partnership, the Coosa River Basin Steering Committee, the Coosa River Basin Inititive and the general public.
Discussion: Although it is recognized that water quality on a basin-wide scale may respond slowly to management measures, implementation of this plan can be improved if everyone "works off the same page." Coordination is needed to assure that

stakeholders cooperatively achieve the objectives of this Management Plan using specific action items listed herein. Cooperation is especially critical with Georgia, since a large percentage of nutrients and other contaminants are coming from across the State line.

Responsible Parties: CWP and CAC committees
Cooperators: All stakeholders
Potential Funding: Unknown
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:

1. Facilitate inclusive river basin partnerships. Ensure that public participation efforts meet the needs of various affected segments of the population, taking into account low-income and minority populations
2. Maintain responsive and reliable lines of communication. Provide ways to resolve disagreements when sincere differences in opinions occur
3. Incorporate citizen-based input into resource agency decision-making processes through the development of a Citizen Advisory Committee and subcommittees
4. Provide stakeholders with ample opportunities to engage in basin-wide management plan implementation efforts
5. Provide stakeholders with education and outreach and training to illustrate the need to take personal responsibility for solutions to river basin problems
6. Coordinate funding, technical assistance, and technology transfer to resolve basin-wide environmental and economic issues
7. Develop subwatershed protection plans that incorporate basin plan objectives
8. Incorporate subwatershed protection plans as addendum's to this basin management plan
9. Promote the voluntary approach but utilize regulatory mechanisms when the voluntary approach doesn't appear to be working
10. Build on past successes and lessons learned so as not to repeat past mistakes or to duplicate efforts as work progresses
11. Cooperatively develop and implement new and innovative, and proven-effective management practices
12. Conduct surveys to sense if basin stakeholders integrate environmental awareness and values into their daily activates such as volunteer monitoring and clean ups, recycling, taking waste oil to collection centers, apply home fertilizers and pesticides at only as needed, etc.
13. Develop and coordinate realistic and achievable timelines to implement management measures
14. Assess progress in achieving basin objectives. Make allowances for management practice course corrections when objectives are not being achieved
15. Define desirable and minimally acceptable implementation "success" conditions
16. Implement corrective actions in priority areas including Section 303(d) listed waters, areas with threatened and endangered species, wetlands, critical habitats, threatened groundwaters, and specific land uses

Progress and Success Criteria:

1. Many and varied stakeholders represented in basin management decisions
2. Responsive and reliable lines of communication established between many and varied parties

3. Citizen input used in decision-making processes
4. Stakeholders volunteer to implement components of the basin management plan
5. Education and outreach provided to illustrate the need for citizens to take responsibility for solutions to problems identified in the river basin
6. Funding, technical assistance, and technology transfer provided to resolve basin-wide environmental and economic issues
7. Subwatershed protection plans developed that incorporate basin plan objectives
8. Subwatershed protection plans incorporated as addendum's into this basin management plan
9. The voluntary approach promoted but regulatory mechanisms utilized when the voluntary approach doesn't appear to be working
10. Successes and lessons learned analyzed so as not to repeat past mistakes as work progresses or to duplicate efforts
11. New and innovative, and proven-effective management practices developed and implemented
12. Surveys conducted to assess basin stakeholder environmental awareness and values
13. Realistic timelines developed to implement management measures
14. Progress in achieving basin objectives reviewed and allowance for course corrections made when objectives are not being achieved
15. Desirable and minimally acceptable implementation "success" conditions defined
16. Corrective actions are implemented in priority areas including Section 303(d) listed waters, areas with threatened and endangered species, wetlands, critical habitats, threatened groundwaters, and specific land uses

b. Solicit stakeholder input to develop and update all components of this river basin management plan.

Discussion: It is very important to have buy-in from Upper Coosa River Basin stakeholders such as landowners, agencies, governmental units, planners, engineers, and citizens. Interaction between interest groups and resource agencies with a stake in the health and productivity of the basin is critical to long-term protection. Opportunities for coordination and interaction are needed to build mutual trust and understanding.
Responsible Parties: CWP and CAC committees
Potential Funding: Section 319, CWP
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action items:

1. Conduct public forums in counties, communities and watersheds throughout the river basin
2. Circulate draft and final management plans to interested citizens for comment. Provide ample comment periods and public hearings to solicit input
3. Provide an annual progress review of management plan implementation successes and needs
4. Update the management plan as needed after ample stakeholder input
5. Facilitate an official "Adoption" of the Plan by the CWP, public officials, and other stakeholders
6. Conduct a public "signing ceremony" at a water-related event such as the *Renew Our R*ivers clean up
7. Publicly recognize or award individuals and groups providing or contributing human and financial resources to basin management objectives

Progress and Success Criteria:
1. Public forums conducted throughout the river basin
2. Opportunities for the public to comment on draft and final basin management plans provided
3. Reviews of management plan implementation successes and needs instituted
4. Basin management plan updated based on stakeholder input
5. An official "Adoption" of the basin management plan conducted
6. A public "signing ceremony" at a water-related event conducted
7. Individuals and groups providing or contributing human and financial resources to basin management objectives publicly recognized or awarded

c. Facilitate additional information gathering strategies and help further characterize Management Plan needs and revisions

Discussion: In order to effectively develop, implement, or update this basin Management Plan, up-to-date information is needed.
Responsible Parties: CWP Facilitator and CAC committees
Cooperators: Planners, city and county governmental units, academia, citizens
Potential Funding: CWP, ADECA, Legacy,
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Assess trends in land use, as well as the factors that contributed to changes in land use
2. Identify potential environmental health hazards throughout the basin
3. Determine if and how basin wide natural resources influence land-use planning decisions and development, serve as mechanisms for citizen involvement (environmental protection and restoration), attract intrastate or interstate attention, or provide economic benefits
4. Evaluate whether real and potential recreational activities can be used as an accommodating mechanism to bring together various ethnic, social, and economic stakeholders to protect or improve natural resources

Progress and Success Criteria:
1. Opportunities identified for developing greenways and nature trails, installing conservation easements on private lands, redeveloping brownfields, and implementing sustainable grazing, farming, and logging practices on public and private lands
2. Management measures developed or installed to minimize public health risk (e.g., toxic waste site leachate or runoff)
3. Strategies developed that provide insight into if and how stakeholders value their natural resources (e.g., hunting/fishing, water sports, hiking/biking/walking trails, ecotourism, etc.)
4. Strategies developed that are environmentally protective and economically viable (e.g., resource extraction, farming, logging, road building, extending water/sewer lines, etc.)
5. Environmental and natural resource protection influenced by citizen interest in recreational benefits

d. Promote, develop or expand environmental awareness in public and private schools

Discussion: Environmental education materials and outreach programs for schools, educators and others involved in environmental education should be collected, developed, evaluated and distributed. Materials are needed that are relevant to the Upper Coosa River Basin and instill a sense of pride, interest and participation in environmental protection. Education materials should be grade level appropriate.
Responsible Parties: CWP Facilitator and CAC
Cooperators: Legacy, ADEM, public and private school districts
Potential Funding: Legacy, Section 319
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. The CWP facilitator will research availability, acquire and distribute education resources to public and private school teachers and students
2. The CWP facilitator will provide presentations, and recruit volunteers to do presentations, for classes and youth groups
3. Promote the construction and use of outdoor environmental education learning centers and classrooms

Progress and Success Criteria:
1. Education resources distributed to public and private school teachers and students
2. Presentations provided to classes and youth groups
3. Outdoor environmental education learning centers and classrooms constructed and used throughout the river basin

e. Promote basin management activities through the news media and other outlets to increase citizen awareness

Discussion: Presenting accurate, meaningful, and timely information to a large sector of the population in a cost-effective and short time period, is important. Knowledge, concerns, and perceptions are important components to basin wide management and environmental awareness. Mass communication is effective in increasing participation and interest and targeted specific groups. Widespread information exchange is needed to deliver information to river basin stakeholders that makes sense to them and relates to their various interests and values.
Responsible Parties: CWP and CAC
Cooperators: Print and electronic news media
Potential Funding: CWP, Section 319
Schedule: Ongoing, beginning first quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Publish articles in newspapers and newsletters to update citizens on Management Plan activities and successes within the Upper Coosa
2. Use radio and television media public service announcements (PSAs) for Upper Coosa River activities

3. Promote Clean Water Partnership PSAs
4. Develop a traveling tabletop display to use at area fairs, civic club presentations, etc.
5. Acquire a well-known spokesperson--such as the band Alabama--for promoting the project
6. Conduct mass mailings to lake homeowners, recreational lot owners, and property owners associations

Progress and Success Criteria:
1. Articles published in newspapers and newsletters
2. Radio and television media public service announcements announcing Upper Coosa River activities (PSA)
3. Clean Water Partnership PSAs used throughout the basin

f. Develop and maintain a website for the Upper Coosa River Basin

Discussion: A website is needed to provide instant and widespread exchange of river basin information.
Responsible Parties: CWP Facilitator and CAC
Potential Funding: CWP, water boards and utilities
Schedule: Fourth quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action items:
1. Develop and maintain a Upper Coosa website. The Upper Coosa CAC will choose a domain name and host for the site
2. Add or link to Coosa River basin subwatershed management plans and activities as appropriate
3. Provide a link to the statewide Clean Water Partnership Website

Progress and Success Criteria:
1. A Upper Coosa River Basin website developed and maintained
2. Links to other Coosa River subwatershed management plans and the CWP website provided

g. Design and print brochures and other materials describing the scope, extent, goal, and objectives of the Upper Coosa River Basin Management Plan

Discussion: Education and outreach materials are needed to promote river basin management plan goals and objectives and management measurers. The materials should provide sufficient knowledge and be clear enough so that stakeholders can identify with it, and specific enough so that citizens recognize their roles and responsibilities in the implementation process.
Responsible Parties: CWP Facilitator and CAC
Cooperators: All stakeholders
Potential Funding: Section 319
Schedule: Second quarter, 2005; update as needed
Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. Develop an appropriate river basin management or CWP logo to be used on education and outreach materials
2. Develop and include a map of the Upper Coosa River Basin and add other graphics as appropriate

Progress and Success Criteria:
1. Upper Coosa River Basin or CWP logos identify basin wide education and outreach materials
2. Maps and other graphic are incorporated into basin wide education and outreach materials

h. Place "Upper Coosa River Basin Boundary" signs on major roads entering and leaving the Basin

Discussion: Citizens need to be aware or routinely reminded of the unique resources that are available in the river basin and the need to maintain and protect them for future generations. Roadside signs or billboards need to be installed along major roads to encourage pride and "ownership" for residents and to promote the environmental management concept to visitors.
Responsible Parties: CWP and CAC
Cooperators: SWCDs
Potential Funding: Section 319 funding, city and county governmental units, water boards and utilities
Schedule: Third quarter, 2005
Load Reduction Estimates: TBD
Estimated Cost: $150 per sign

Action Item:
1. Install Upper Coosa River Basin specific signage along major roads to encourage basin and watershed pride and "ownership" for residents and visitors

Progress and Success Criterion:
1. Signage installed along major roads entering the river basin

i. Develop PowerPoint presentations to present to educators, civic organizations, businesses, homebuilders associations, county and city personnel, etc., to promote the project

Discussion: Although many people do not want to cause or contribute to pollution problems, many do so because of a lack of information or environmental awareness. Education materials should stress that the Coosa River and its tributaries are valuable assets and have potential benefits that may not yet be realized. Individual and collective actions can impair water quality and rob river basin residents of environmental and economic benefits. However, residents can be instructed to do specific things to protect and restore water quality so that they can reap the benefits and improve their quality of life. User friendly, electronic media presentations are needed to target specific audiences throughout the river basin.
Responsible Parties: CWP and CAC
Cooperators: ADEM, Legacy, SWCDs,
Potential Funding: Legacy, Section 319
Schedule: Ongoing, beginning first quarter, 2005

Load Reduction Estimates: TBD
Estimated Cost: Unknown

Action Items:
1. The CWP facilitator and other group leaders will use or modify existing presentations (e.g., PowerPoint), as appropriate, to target particular issues, concerns, and audiences and maintain cooperative stakeholder communication and partnerships
2. The CWP facilitator and other volunteers will deliver presentations and talks to inform stakeholders and change attitudes and behaviors that contribute to basin degradation

Progress and Success Criteria:
1. Presentations are developed or modified
2. A speakers bureau is established to give presentations
3. Presentations are delivered to targeted audiences

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GLOSSARY

Aquatic – Associated with water; living or growing in or near water
Aquifer – A sand, gravel, or rock stratum capable of storing or conveying water below the surface of the land
Artificial wetland – Land that would not have been classified as a wetland under natural conditions but now exhibits wetland characteristics because of human activities
Best Management Practice (BMP) – A conservation practice, a structure, technique, or measure to address a pollutant source, cause, or problem
Constructed wetlands – Wetlands that are intentionally created on sites that are not wetlands for the primary purpose of treating wastewater or runoff and are managed as such
Cost-share – Federal and/or State funds provided to a landowner through an agreement to install a best management practice
Designated uses – Existing uses of a waterbody that must be protected as well as potential prospective and future uses of that waterbody
Discharge- the flow of from a conveyance into a receiving body of water
Drainage basin – A geographic and hydrologic distinct watershed
Ecosystem – interaction of a biological community with its nonliving environmental surroundings
Erosion – the wearing away of the land surface by wind or water. Erosion occurs naturally from weather or runoff but can be intensified by land-clearing practices related to farming, residential or industrial development, road building, or timber cutting
Eutrophication – The natural or artificial process of nutrient enrichment often resulting in a water body becoming filled with algae and other aquatic plants
Fecal coliforms – A group of bacteria found in the intestinal tract of all warm-blood animals, including humans. While most species are harmless in themselves, coliform bacteria are commonly used as indicators of the presence of pathogenic (disease causing) organisms
Groundwater - That portion of the soil or rock where all pore spaces are completely saturated; the water that occurs in the earth below the depth to which water will rise in a well
Herbicides – Chemicals used to kill selected vegetation
Impervious surface – A hard surface area that either prevents, retards, or impedes natural infiltration of water into the soil or causes water to runoff the surface in greater quantities or at an increased rate of flow than under natural conditions. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled surfaces
Land disturbance – An activity that results in a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. Land-disturbing activities include, but are not limited to construction, clearing, grading, filling, and excavation
Leachate – The liquid, often contaminated, that leaches from a porous medium, such as a manure pile, silage pit, or landfill into the soil or groundwater
Management practice or measure – Economically achievable measures to control the addition of pollutants and reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives
Nonpoint source pollution – Pollution arising from an ill-defined and diffuse source rather than a single identifiable source or conveyance. Examples include runoff from

agriculture, mining, logging, construction, the urban environment, oil and gas leaks, or faulty septic tanks

NPDES permit – National Pollution Discharge Elimination System permit required for point source pollutant discharges to waters of the U.S.

Nutrients – Chemical elements and compounds needed by plants. Major nutrients include nitrogen, phosphorous and potassium in different chemical compounds. Minor nutrients include such elements as zinc and copper

Onsite sewage disposal or treatment system – A system designed to treat wastewater at a particular site such as single family dwellings or small businesses not connected to municipal sewage treatment systems

Pathogens – Disease-causing organisms

Pesticide – A chemical substance used to kill or control pests such as weeds, insects, fungus, mites, algae, rodents, and other undesirable agents

Ph – An expression of the intensity of the acid or alkaline condition of a solution; an indirect measure of the concentration of hydrogen ions in a solution, having a scale from zero (extremely acidic) to 14 (extremely alkaline) with 7 being neutral.

Point source pollution – Pollution coming from a well-defined origin, such as the discharge from an industrial plant, municipal wastewater treatment facility, sewer overflows, or other end-of-pipe pollutant conveyances

Pollutants – Any of the various noxious chemicals and refuse materials that impair the purity of water, soil or the atmosphere

Restoration – Term used when land, water, or air functions and values that were degraded or lost are restored on the same site or in the same area

Runoff – That portion of precipitation or irrigation water that flows off an impermeable or saturated surface. The water that flows off the surface of the land without infiltrating into the soil is called surface runoff

Section 303(d) List – A list of lakes or stream segments that do not meet one or more of their designated uses. Such waterbodies are required under Section 303(d) of the federal Clean Water Act to be included on a list to be submitted to EPA by states every 2 years

Section 305(b) Report – A biennial report required under Section 305(b) of the federal Clean Water Act used by EPA, Congress, and the public to identify the status and recent trends of the quality of the State's waters and to assess the effectiveness of statewide pollution control efforts

Sediment – Solid material that is in suspension, is being transported, or has been moved from its original location by air, water, gravity, or ice

Sinkhole – A natural depression or man-induced opening on the land surface which often includes a channel or hole leading directly to groundwaters and usually in areas underlain by cavernous limestone

Topography – The surface configuration of the landscape

Turbidity – a cloudy condition in water due to suspended silt or organic matter

Urban runoff – That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, underflow, or channels or is piped into a defined surface water channel or a constructed infiltration facility

Water quality standard – Standards for surface water quality that define goals for specific waterbodies consisting of three components: designated uses, criteria, and anti-degradation

Waters of the State – All lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems, and other surface water or groundwater, natural or artificial, public or private, within the boundaries of the state of Alabama or its jurisdiction

Watershed – The land area that drains to a particular point or in the landscape (to a pond, lake, river, etc.)
Watershed protection plan – A document developed to address identified and/or predicted environmental problems in a drainage area.
Wetlands – Areas that are inundated or saturated by surface or ground waters at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; wetlands generally include swamps, marshes, bogs, and similar areas

Appendices

APPENDIX 1

Land Use by Subwatershed (ASWCC 1998)

County	HUC	Subwatershed	Total Area	Cropland		Patureland		Forestland		Urbanland		Open Water		Mined land		Other land	
			Acres	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
CHEROKEE	60	Lower Chatooga River	21735	7087		1587		9387		1407		1645		10		612	
TOTAL	60	Lower Chatooga River	21735	7087	33	1587	7	9387	43	1407	6	1645	8	10	<1	612	3
DEKALB	80	West Fork Little River	18553	320		2266		14582		374		171		160		680	
TOTAL	80	West Fork Little River	18553	320	2	2266	12	14582	79	374	2	171	1	160	1	680	4
CHEROKEE	100	East Fork Little River	5504	147		394		4486		0		185		0		292	
DEKALB	100	East Fork Little River	13195	372		1460		10876		0		87		55		345	
TOTAL	100	East Fork Little River	18699	519	3	1854	10	15362	82	0		272	1	55	<1	637	3
DEKALB	110	Bear Creek	46177	3120		12006		29881		0		206		440		524	
TOTAL	110	Bear Creek	46177	3120	7	12006	26	29881	65	0		206	<1	440	1	524	1
CHEROKEE	120	Little River	14303	221		148		13668		0		82		0		184	
TOTAL	120	Little River	14303	221	2	148	1	13668	96	0		82	1	0		184	1
CHEROKEE	130	Spring Creek	26205	3077		3104		14933		238		1645		0		3208	
TOTAL	130	Spring Creek	26205	3077	12	3104	12	14933	57	238	1	1645	6	0		3208	12
CHEROKEE	140	Yellow Creek	42145	4783		5948		16480		4500		8910		300		1224	
DEKALB	140	Yellow Creek	12995	1500		3945		6688		75		80		40		667	
TOTAL	140	Yellow Creek	55140	6283	11	9893	18	23168	42	4575	8	8990	16	340	1	1891	3
CHEROKEE	180	Coosa River	38319	9930		2850		9676		1836		10967		0		3060	
TOTAL	180	Coosa River	38319	9930	26	2850	7	9676	25	1836	5	10967	29	0		3060	8
CHEROKEE	200	Spring Creek	68771	17073		5097		30024		4769		9320		40		2448	
TOTAL	200	Spring Creek	68771	17073	25	5097	7	30024	44	4769	7	9320	14	40	<1	2448	4
CALHOUN	220	Upper Terrapin Creek	36344	1090		9086		17445		7995		363		181		181	
CHEROKEE	220	Upper Terrapin Creek	8723	1472		479		6062		0		343		0		367	
CLEBURNE	220	Upper Terrapin Creek	60661	0		2426		57666		0		303		0		266	
TOTAL	220	Upper Terrapin Creek	105728	2562	2	11991	11	81173	77	7995	8	1009	1	181	<1	814	1
CHEROKEE	240	Hurricane Creek	34760	384		257		33928		0		69		0		112	
TOTAL	240	Hurricane Creek	34760	384	1	257	1	33928	98	0		69	<1	0		112	<1
CHEROKEE	250	Lower Terrapin Creek	34605	6592		2378		24817		0		206		0		612	
TOTAL	250	Lower Terrapin Creek	34605	6592	19	2378	7	24817	72	0		206	1	0		612	2
CHEROKEE	260	Sugar Creek	10561	1840		246		8060		0		48		0		367	
TOTAL	260	Sugar Creek	10561	1840	17	246	2	8060	76	0		48	<1	0		367	3
CHEROKEE	270	Coosa River	11636	6156		458		4545		0		110		0		367	
TOTAL	270	Coosa River	11636	6156	53	458	4	4545	39	0		110	1	0		367	3

APPENDIX 2

Summary of current Construction/Stormwater Authorization, Noncoal< 5 Acres/Stormwater Authorizations, NPDES Permits and CAFO Registration issued within each subwatershed of the Upper Coosa River Basin (ADEM 2002)

Cataloging Unit And Subwatershed	# of Authorizations / # NPDES permits / Registrations							
	Total Number	Construction / Stormwater Authorizations (a)	Non-Coal Mining <5 Acres / Stormwater Authorizations (a)	Mining NPDES (c)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)	CAFO Registrations (c)
Upper Coosa (0315-0105)								
030	1	1						
050	4	1		1				2
060	3	1			1			**1**
080	1					1		
100	1	1						
110	3	2	1					
120	0							
130	2	1	1					
140	3	2				1		
180	1	1						
200	4	2			1			1
220	5	4			1			
240	3	1		1				1
250	4	1	1	1				1
260	1	1						
270	3	2					1	

(a) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (7/18/00) (ADEM 1999 e)

(b) Source: 1996 CWS Report (ADEM 1999a)

(c) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (08/3/01)(ADEM 2001d)

APPENDIX 3

Summaries of Upper Coosa Data Collection Projects

(adapted from ADEM's Surface Water Quality Screening Assessment of the Coosa River Basin-2000)

Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study:
Lead agency: Cooperative effort by Auburn University, ADEM and EPA
Purpose: The objectives of this study were to gather historic and current data on Lake Henry, identify water quality problems and determine feasible solutions for their correction.
Reference: Bayne, 1997

303(d) Waterbody Monitoring Project:
Lead agency: ADEM
Purpose: In accordance with §303(d) of the Federal Clean Water Act, each state must identify its water bodies that do not meet surface water quality standards and submit this list to the USEPA. In an effort to address water quality problems within Alabama, some waterbodies included on ADEM's 1996 and 1998 §303(d) lists are only "suspected" to have water quality problems based on evaluated assessment data. ADEM conducts monitored assessments of these and other suspected impaired waterbodies to support §303(d) listing and de-listing decisions. This project includes intensive chemical, habitat, and biological data collected using *ADEM Standard Operating Procedures and Quality Assurance / Quality Control manuals (SOP QA/QC).*
Reference: ADEM 2000 d.

ALAMAP (Alabama Monitoring and Assessment Program)
Lead agencies: ADEM and USEPA
Purpose: Statewide monitoring effort to provide data that can be used to estimate the status of all streams within the State. Evaluated assessment data, including chemical, physical, and habitat parameters are collected once at 250 randomly selected wadeable stream stations (provided by USEPA-Gulf *Breeze*) over a 5-year period using current *ADEM SOP QA/QC manuals.*
Reference: ADEM 2000 a.

Ambient Trend Monitoring Program:
Lead agency: ADEM
Purpose: Long term water quality and biological monitoring has been conducted at stations located throughout Alabama. Stations were established primarily to monitor water quality below point source discharges. During 1996, with the addition of upland ALAMAP, the ambient monitoring program was modified to focus on wadeable streams and rivers. Large river sites near a monitored reservoir were transferred to ADEM's Reservoir Monitoring Program (1997a). Eight ambient trend-monitoring stations were established in the Coosa River. In general, intensive water quality sampling was conducted at these sites using *ADEM SOP QA/QC manuals.*
Reference: ADEM 2001 a.

APPENDIX 3 cont.

Ecoregional Reference Reach Program:
Lead agency: ADEM
Purpose: Ecorgeions are relatively homogeneous ecological area defined by similarity of climate, landform, soil potential natural vegetation, hydrology, or other ecologically relevant variables, since 1991 ADEM has maintained a network of least-impaired ecoregional reference sites.Intensive monitoring assessments, including chemical, physical, habitat, and biological data, are collected to develop baseline reference conditions for each of Alabama's 29 Level IV sub-ecorgions (Griffith et al. 2001). All samples and in-situ measured were collected in accordance with *ADEM SOP QA/QC manuals.* The reference condition establishes the basis for making comparisons and detecting use impairment.
Reference: ADEM 2000 b.

University Reservoir Tributary Nutrient Study:
Lead Agencies: Cooperative effort by the University of Alabama, Auburn University, Tennessee Valley Authority and Auburn University at Montgomery funded by ADEM
Purpose: Intensive chemical sampling was conducted October 1998-March 2000 to study nutrient loading from tributaries to 26 reservoirs in Alabama. These data were used to quantify tributary nutrient loads to reservoirs, and, in conjunction with ongoing efforts to quantify point source nutrient loads, provide estimates of non-point source nutrient contributions. These loading estimates will be essential to the Department's effort to address lake eutrophication concerns across the State. Samples were collected monthly, June-November and biweekly, December-May. All samples and in-situ measures were collected in accordance with *ADEM SOP QA/QC manuals.*
Reference: ADEM 2000 e.

Clean Water Strategy Project:
Lead Agency: ADEM
Purpose: Intensive water quality monitoring was conducted to evaluate the condition of the State's surface waters, identify or confirm problem areas, and to serve as a guide from which to direct future sampling efforts. Sampling stations were chosen where problems were known or suspected to exist, or where there was a lack of existing data. Data was collected monthly, June through October, 1996. All samples and in-situ measures were collected in accordance with *ADEM SOP QA/QC manuals.*
Reference: ADEM 1999 a.

Reservoir Water Quality Monitoring Programs:
Lead Agency: ADEM
Purpose: The RWQM Program takes seasonal samples (Spring & Summer) to assess and monitor the State's reservoirs.
Reference: ADEM 2001 b.

APPENDIX 3 cont.

State Parks Monitoring Project:
Lead agency: ADEM
Purpose: The objective of this project was to assess water quality of flowing streams in sub-watersheds located within Alabama's State Parks, to identify current and potential causes and sources of impairments, and to identify non- or minimally-impaired streams that may be considered for water use classification upgrade to Outstanding Alabama Water (OAW) (ADEM 1999). Intensive monitoring assessments, including chemical, physical, habitat, and biological data, were conducted at 34 sites in or near nine State Parks during 1998. All samples and in-situ measures were collected in accordance with current *ADEM SOP QA/QC manuals*.
Reference: ADEM 1999 b.

Alabama Water Watch:
Lead Agency: Administered through Auburn University with grants from ADEM/EPA Region 4.
Purpose: Alabama Water Watch is a citizen volunteer, water quality monitoring program covering all the major river basins of Alabama and watersheds shared with neighboring states. This program solicits volunteers to actively participate in determining long-term water quality trends and specific problems that need attention. Citizens are trained to use standardized equipment and techniques to gather credible water information under strict quality assurance protocols.
Reference: AWW, 2002

USGS Data Collection
Lead Agency: U.S. Geological Survey
Purpose: The USGS collects data for baseline purposes and for various studies. Data used for the Upper Coosa Management Plan include the USGS National Water-Quality Assessment Program of the Mobile River Basin, and USGS data collected for ADEM purposes. Other sites used include those located in Alabama but maintained by the USGS in Georgia for the Georgia Department of Natural Resources. Data collected includes physical, chemical and biological parameters. Data results from these studies are compiled and can be accessed through the USGS website.
Reference: USGS, 2004

APPENDIX 4

Location Descriptions for stations where data were collected within the Upper Coosa River Basin from 1992 to 2002.

Sub-Watershed	County	Station Number	Purpose	Waterbody Name	Station Description	Latitude	Longitude
030	Cherokee	CT-2	Ambient Monitoring Station	Chattooga R.	Near Cherokee Co. Rd. 140 at the Georgia State Line	34.31417	-85.46811
050	Cherokee	MLL-10	FY 2000 NPS Screening Station	Mills Creek	Cherokee Co. Rd. 747 (dirt road past bridge)	34.38285	-85.49799
050	Cherokee	MLLC-11	FY 2000 NPS Screening Station	Mills Creek	Cherokee Co. Road 56	34.32758	-85.50294
060	Cherokee	W-6	ADEM Reservoir Tributary Monitoring FY00	Chattooga R.	Deepest point, main river channel, Chattooga River embayment, CRM 12.5	34.24432	-85.61202
060	Cherokee	CHAAU01	University Reservoir Tributary Nutrient Study 1999	Chattooga R.	Cherokee Co. Rd. 97 near Fullerton	34.29028	-85.50917
080	DeKalb	STRD-1	State Parks Study	Straight Cr.	Trail in DeSoto State Park	34.47370	-85.60640
080	DeKalb	CO-13	CWS-96	W. Fork Little R.	River ford on Co. Rd. 517 off of unnamed Co. Rd. NE of Mentone	34.58664	-85.56356
080	DeKalb	CO-14	CWS-96	W. Fork Little R.	DeKalb Co. Rd. 165 south of Mentone	34.50842	-85.60844
080	DeKalb	WFLD-1	State Parks Study	W. Fork Little R.	DeKalb Co. 165	34.50860	-85.60870
080	DeKalb	WFLD-2	State Parks Study	W. Fork Little R.	DeSoto State Park	34.49790	-85.61620
100	Cherokee	CO-01	CWS-96	E. Fork Little R.	Co. Rd. 84, south of dam	34.52383	-85.51394
100	Cherokee	CO-02	CWS-96	E. Fork Little R.	½ mile south of Lookout Mountain Boys Camp-RR crossing	34.51267	-85.53311
110	DeKalb	BERD-9	Ecoregional Reference Sation	Bear Creek	On unnamed DeKalb Co. Rd., off of AL Hwy 176 near Ft. Payne	34.38094	-85.69789
110	DeKalb	CO01U1	ALAMAP 1997	E. Fork Little R.	Approx. 6.7 miles upstream of confluence with Bear Creek	34.41680	-85.59970
110	Dekalb	HURD-1	State Parks Study	Hurricane Cr	Trail in Little River Wildlife Management Area	34.42140	-85.60130

APPENDIX 4 Cont.

Location Descriptions for stations where data were collected within the Upper Coosa River Basin from 1992 to 2002.

Sub-Watershed	County	Station Number	Purpose	Waterbody Name	Station Description	Latitude	Longitude
110	Cherokee	W-5	ADEM Reservoir Tributary Monitoring FY00	Little R	Deepest point, main river channel, Little River embayment, LRM 12.5	34.25246	-85.66027
110	Dekalb	CO07U3-25	ALAMAP 1999	Little R	Little River	34.42400	-85.59140
120	Cherokee	CO-12	CWS-96	Little R	AL Hwy 273 at Little River	34.28186	-85.67244
120	Cherokee	LTRAU01	University Reservoir Tributary Nutrient Study 1999	Little R	AL Hwy 273 near Little River	34.28889	-85.68056
140	Cherokee	WLFC-5	Candidate Reference site	Wolf Cr	Co. Rd. 47	34.25494	-85.71339
140	Cherokee	YLWC-6	FY2000 NPS Screening Station	Yellow Cr	Cherokee Co. Rd. 166	34.22513	-85.74387
180	Cherokee	COOAU01 (CO-3)(CO-30)	University Reservoir Tributary Nutrient Study 1999 (ADEM Ambient Station) (CWS-96)	Coosa R	Coosa River on the Alabama/Georgia State Line ADEM Trend Station	34.20000	-85.44472
200	Cherokee	W-7	ADEM Reservoir Tributary Monitoring FY00	Spring Cr	Deepest point, main creek channel, Spring Creek embayment, downstream of Cherokee Co. Hwy. 31 bridge	34.14568	-85.57082
200	Cherokee	W-8	ADEM Reservoir Tributary Monitoring FY00	Cowan Cr	Deepest point, main creek channel, Cowan Creek embayment, downstream of Cherokee Co. Hwy. 16 bridge	34.14400	-85.59432
200	Cherokee	W-9	ADEM Reservoir Tributary Monitoring FY00	Big Nose Cr	Deepest point, main creek channel, Big Nose Creek embayment, approximately 0.5 miles upstream of lake confluence.	34.17799	-85.68242
220	Cherokee	CO-15	CWS-96	Terrapin Cr	Co. Rd. 8 West of McFrey Crossroads	33.97961	-85.60122
240	Cherokee	FRG-1	FY99 303(d) Monitoring Proj.	Frog Cr	Cherokee Co. Rd. 177; approx. 1.9 miles upstream of confluence with Hurricane Creek.	34.00110	-85.54800
240	Cherokee	FRG-2	FY99 303(d) Monitoring Proj.	Frog Cr	Cherokee Co. Rd. 12; approx. 6.2 miles upstream of confluence with Hurricane Creek.	34.03070	-85.49530
240	Cherokee	HRC-1	FY99 303(d) Monitoring Proj.	Hurricane Cr	Cherokee Co. Rd. 33; approx. 0.9 miles upstream of confluence with Terrapin Creek.	34.00280	-85.57900
240	Cherokee	HRC-2	FY99 303(d) Monitoring Proj.	Hurricane Cr	Cherokee Co. Rd. 29; approx. 4.1 miles upstream of confluence with Terrapin Creek.	33.98690	-85.54280

APPENDIX 4 Cont.

Location Descriptions for stations where data were collected within the Upper Coosa River Basin from 1992 to 2002.

Sub-Watershed	County	Station Number	Purpose	Waterbody Name	Station Description	Latitude	Longitude
240	Cherokee	HRC-3	FY99 303(d) Monitoring Proj.	Hurricane Cr	Cherokee Co. Rd. 8; approx. 6.7 miles upstream of confluence with Terrapin Creek.	33.99070	-85.50380
240	Cherokee	WOB-1	FY99 303(d) Monitoring Proj.	Wolf Branch	adjacent to Cherokee Co. Rd. 111 downstream of poultry houses	33.98430	-85.51940
240	Cherokee	WOB-2	FY99 303(d) Monitoring Proj.	Wolf Br	US Hwy 278	33.97840	-85.51790
250	Cherokee	CO-16	CWS-96	Terrapin Cr	AL Hwy 9 at Ellisville	34.06328	-85.61197
250	Cherokee	CO-17	CWS-96	Terrapin Cr	Co. Rd. 71 South of Centre	34.12194	-85.67672
250	Cherokee	TERAU01	University Reservoir Tributary Nutrient Study 1999	Terrapin Cr	AL Hwy 9 near Ellisville	34.06500	-85.61417
250	Cherokee	CO6U4-45	ALAMAP 2000	Terrapin Cr, UT to	Tributary to Terrapin Creek	34.10350	-85.64630
270	Cherokee	COOAU02	University Reservoir Tributary Nutrient Study 1999	Coosa R	Weiss Dam Tailrace Co. Rd. 7	34.17194	-85.75389
200	Cherokee	SPRC-1	FY02 303(d) Monitoring Proj.	Spring Creek	Spring Creek @ Co. Rd. 41	34.27900	-85.59929
200	Cherokee	SPRC-2	FY02 303(d) Monitoring Proj.	Spring Creek	Spring Creek @ Co. Rd. 41	34.32250	-85.58705
200	Cherokee	MUDC-10	FY02 303(d) Monitoring Proj.	Mud Creek	Mud Creek @ Co. Rd. 35	34.30175	-85.57748
180	Cherokee	0	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, power dam tailrace.	34.1295	-85.7942
180	Cherokee	1	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, power dam forebay.	34.13481	-85.79105
180	Cherokee	2	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, immed. upstream of causeway at Cedar Bluff	34.205743	-85.610495
200	Cherokee	3	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, at power line crossing up stream of Spring Creek.	34.210317	-85.5468
180	Cherokee	4	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, immed. upstream of Mud Creek / Coosa River confluence.	34.180011	-85.484713

APPENDIX 4 Cont.

Location Descriptions for stations where data was collected within the Upper Coosa Watershed from 1992 to 2002.

Sub-Watershed	County	Station Number	Purpose	Waterbody Name	Station Description	Latitude	Longitude
120	Cherokee	5	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, Little River embayment, LRM 12.5	34.252456	-85.660267
60	Cherokee	6	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main river channel, Chattooga River embayment, CRM 12.5	34.244317	-85.612025
200	Cherokee	7	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main creek channel, Spring Creek embayment, downstream of Cherokee Co. Hwy. 31 bridge.	34.14568	-85.570818
200	Cherokee	8	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main creek channel, Cowan Creek embayment, downstream of Cherokee Co. Hwy. 31 bridge.	34.144002	-85.594325
200	Cherokee	9	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main creek channel, Big Nose Creek embayment, approx. 0.5 miles upstream of lake confluence.	34.177993	-85.682425
180	Cherokee	12	ADEM Reservoir Water Quality Monitoring Program	Weiss Lake	Deepest point, main creek channel, Alabama/Georgia state line.	34.202441	-85.452402
180	Cherokee	1	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Weiss Lake in the powerhouse embayment	34.1447	-85.7899
180	Cherokee	2	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Deepest point, main river channel, original river channel dam forebay.	34.174	-85.754
180	Cherokee	3	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Deepest point, main river channel, approx. midway between stations 2 and 8.	34.195	-85.6604
180	Cherokee	4	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Weiss Lake shallow overbank approx. midway between stations 2 and 8	34.1886	-85.6629
140	Cherokee	5	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Yellow Creek embayment	34.217	-85.7018
120	Cherokee	6	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Little River embayment	34.2500	-85.6661
60	Cherokee	7	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Chattooga River embayment	34.2396	-85.6065
180	Cherokee	8	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Weiss Lake upstream Hwy 68 bridge at Cedar Bluff	34.2500	-85.6661
200	Cherokee	9	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Cowen Creek embayment downstream Cherokee Co. Hwy 16 bridge	34.1417	-85.5945
200	Cherokee	10	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Spring Creek embayment downstream Cherokee Co. Hwy 31 bridge	34.1469	-85.5714

APPENDIX 4 Cont.

Location Descriptions for stations where data was collected within the Upper Coosa Watershed from 1992 to 2002.

140	Cherokee	11	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Deepest point, main river channel, at upstream of Three Mile Creek.		
140	Cherokee	12	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Weiss Lake at overhead powerline		
200	Cherokee	13	Weiss Lake Reservoir Phase I Diagnostic/Feasibility Study	Weiss Lake	Deepest point, main creek channel, Mud Creek embayment, downstream of Cherokee Co. Hwy. 31 bridge.		
60	Cherokee	02398300	USGS National Water-Quality Assessment Program for Mobile River Basin	Chattooga River	Above Gaylesville, AL	34.29028	-85.55917
180	Cherokee	02397530	USGS Water Monitoring for Georgia Dept. of Natural Resources	Coosa River	Alabama/Georgia State Line	34.20166	-85.44750
120	Cherokee	02399200	USGS Water Monitoring for ADEM	Little River	Near Blue Pond, AL	34.28777	-85.68167
250	Cherokee	02400100	USGS Water Monitoring for ADEM	Terrapin Creek	At Ellisville, AL	34.06500	-85.61467
50	Cherokee	02398250	USGS Water Monitoring for Georgia Dept. of Natural Resources	Mills Creek	At Dewey, AL	34.32750	-85.50333
80	DeKalb	02398950	USGS Water Monitoring for Georgia Dept. of Natural Resources	West Fork Little River	At DeSoto State Park, near Ft. Payne	34.49166	-85.61667

APPENDIX 5

Location Descriptions for Alabama Water Watch Data Collection Points (AWW, 2003)

HUC	County	AWW Site Code	Waterbody Name	Site	Latitude	Longitude	Notes
03150105060	Cherokee	05004003	Chattooga River	Site 3, Slaughterhouse Road	34.237704	-85.593551	Inactive
03150105060	Cherokee	05004004	Chattooga River	Site 2, Kelley Farm	34.272759	-85.527915	
03150105050	Cherokee	05004022	Weiss Lake	Site 2, Mill Creek at Hwy 68	34.295371	-85.509419	
03150105130	Cherokee	05004023	Weiss Lake	Site 4, N. Spring Creek at Co. Rd. 75	34.274950	-85.621900	
03150105130	Cherokee	05004024	Weiss Lake	Site 5, Little River	34.266439	-85.652791	Inactive
03150105140	Cherokee	05004025	Weiss Lake	Site 6, Yellow Creek at Hwy 273	34.223130	-85.723000	
03150105200	Cherokee	05004026	Weiss Lake	Site 7, Big Nose	34.165865	-85.677182	
03150105200	Cherokee	05004027	Weiss Lake	Site 8, Cowan Creek at Pruett's Fish Camp	34.143384	-85.595370	
03150105200	Cherokee	05004028	Weiss Lake	Site 9, Spring Creek at Hwy 22 bridge	34.158297	-85.578509	
03150105200	Cherokee	05004029	Weiss Lake	Site 11, end of Co. Rd. 572, Billy Goat	34.197851	-85.694437	
N/A	Cherokee	05004030	Weiss Lake	Site 12, Coosa River channel	N/A	N/A	Inactive
03150105180	Cherokee	05004031	Weiss Lake	Site 13, Co. Rd. 22 at Mud Creek bridge	34.173464	-85.473966	
03150105180	Cherokee	05004032	Weiss Lake	Site 14, Wilson's Landing	34.200099	-85.460211	
03150105180	Cherokee	05004033	Weiss Lake	Site 15, Waterhouse Cove	34.219241	-85.508955	
03150105270	Cherokee	05004034	Weiss Lake	Coosa River/Weiss shoreline marker 82	34.171869	-85.754600	

APPENDIX 5 Cont.

Location Descriptions for Alabama Water Watch Data Collection Points (AWW, 2003)

HUC	County	AWW Site Code	Waterbody Name	Site	Latitude	Longitude	Notes
03150105140	Cherokee	05004041	Little River	Wolf Creek/Little River	34.262530	-85.665247	Inactive
03150105150	Cherokee	05004044	Mills Creek	CR 62	34.400000	-85.500000	
03150105180	Cherokee	05004048	Weiss Lake	Dead Boy Cove	34.199433	-85.502860	
03150105110	Cherokee	05004049	Little River	Just before entering Weiss Lake @ State Rd.	34.279170	-85.672220	
03150105140	Cherokee	05004071	Weiss Lake	Beginning of channel leading into powerhouse	34.174200	-85.756870	
03150105140	Cherokee	05004072	Weiss Lake	End of channel leading into powerhouse	34.156070	-85.769720	
03150105200	Cherokee	05004081	Weiss Lake	CR 69 at Sharps Branch	34.156330	-85.614830	
03150105200	Cherokee	05004082	Weiss Lake	CR 112	34.182000	-85.726830	
03150105200	Cherokee	05004083	Weiss Lake	CR 63 at Little Nose Bridge	34.173850	-85.668543	
03150105060	Cherokee	05004084	Weiss Lake	945 CR 567	34.249780	-85.573120	
03150105141	Cherokee	05004086	Weiss Lake	820 CR 732	34.255850	-85.666030	
	Cherokee	05004091	Weiss Lake	705 CR 585	N/A	N/A	
03150105270		05004092	Coosa River	Coosa River Project FERC #2146, public boat ramp	34.150000	-85.750000	
03150105200		05004092	Weiss Lake	West side between markers 47 & 49	34.185780	-85.620780	
03150105080		05006001	Little River West Fork	DeSoto Falls, 200 yd upstream from dam	34.550000	-85.591670	
		05017008	Little River	Swimming hole, G.E. Hill bridge			

APPENDIX 5 Cont.

Location Descriptions for Alabama Water Watch Data Collection Points (AWW, 2003)

HUC	County	AWW Site Code	Waterbody Name	Site	Latitude	Longitude	Notes
03150105220		05024001	Little Terrapin Creek	Roy Williams, Jr. property (William's pasture)	33.939414	-85.416594	
03150105220		05024002	Little Terrapin Creek	Borden / Wheeler Springs	33.914946	-85.468176	
03150105220		05024003	Natural Spring	Borden / Wheeler Springs (Monahan's Springs)	33.915539	-85.546961	
03150105220		05024004	Big Terrapin Creek	Minton's, T135 R10E S12	33.914716	-85.546961	
03150105220		05024006	Big Terrapin Creek	McKinney's Pasture	33.923410	-85.481378	
03150105080		05027001	Little River West Fork	CR 89, 200 yds from Indian Falls in DeSoto Park	34.496913	-85.616657	
03150105080		05027002	Straight Creek	Off DeKalb CR 951 down CCC Rd.	34.472749	-85.603440	
03150105080		05027003	Sharp Branch	Behind tennis courts in DeSoto State Park	34.503132	-85.616235	
03150105080		05027004	Laurel Creek	Dam at DeSoto Falls	34.498136	-85.618111	
03150105080		05027005	Little River West Fork	Alpine Bridge	34.548968	-85.589349	
03150105080		05027006	Little River West Fork	CR 165	34.508114	-85.608686	
03150105080		05027007	Little River West Fork	Downstream from City Pool, 250 yds. From Coffee St.	34.564301	-85.575034	

APPENDIX 6

Total phosphorus measurements for Weiss Lake (ADEM, Auburn University).

Reservoir Name	Station Number	Agency/ Study	Number of Samples Years			Total P mg/L Years		% of samples over 0.025 mg/L (lakes) or 0.05 mg/L (streams discharging into lakes) Years	
			92-97	98-02		92-97	98-02	92-97	98-02
Weiss Lake	1(R) 1(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	25	23	Min Max Mean	0.06 0.166 0.071	0.020 0.160 0.067	96%	91%
Weiss Lake	2(R) 8(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	25	23	Min Max Mean	0.034 0.170 0.087	0.040 0.170 0.092	100%	100%
Weiss Lake	3(R) 12(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	23	23	Min Max Mean	0.080 0.910 0.147	0.030 0.180 0.099	100%	100%
Weiss Lake	4	ADEM/ RWQM Program	24	26	Min Max Mean	0.060 0.210 0.115	0.050 0.200 0.104	100%	100%
Weiss Lake	5 (R) 6 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	0.020 0.060 0.038	0.004 0.080 0.051	70%	67%
Weiss Lake	6 (R) 7 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	0.070 0.215 0.145	0.060 0.270 0.190	100%	100%
Weiss Lake	7 (R) 10 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	0.067 0.112 0.088	0.040 0.150 0.100	100%	100%
Weiss Lake	8 (R) 9 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	0.060 0.112 0.083	0.050 0.090 0.767	100%	100%

APPENDIX 6 Cont.

Total phosphorus measurements for Weiss Lake (ADEM, Auburn University).

Reservoir Name	Station Number	Agency/ Study	Number of Samples Years			Total P mg/L Years		% of samples over 0.025 mg/L (lakes) or 0.05 mg/L (streams discharging into lakes) Years	
			92-97	98-02		92-97	98-02	92-97	98-02
Weiss Lake	9	ADEM/ RWQM Program	0	6	Min Max Mean	N/A	0.050 0.120 0.085	N/A	100%
Weiss Lake	12	ADEM/ RWQM Program	0	7	Min Max Mean	N/A	0.065 0.154 0.113	N/A	100%
Weiss Lake	2	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.063 0.158 0.091	N/A	100%	N/A
Weiss Lake	3	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.070 0.151 0.098	N/A	100%	N/A
Weiss Lake	4	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.067 0.159 0.101	N/A	100%	N/A
Weiss Lake	5	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.038 0.070 0.054	N/A	100%	N/A
Weiss Lake	11	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.082 0.144 0.113	N/A	100%	N/A
Weiss Lake	13	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	0.081 0.130 0.101	N/A	100%	N/A

R =RWQM Program station number
D/F =Diagnostic/Feasibility Study station number

APPENDIX 7

Chlorophyll-α data for Weiss Lake (ADEM, Auburn University)

Reservoir Name	Station Number	Agency/ Study	Number of Samples Years			Chlorophyll-α (µg/L) Years		% of samples over 20 µg/L Years	
			92-97	98-02		92-97	98-02	92-97	98-02
Weiss Lake	0	ADEM/ RWQM Program	0	7	Min Max Mean	N/A	8.2 28.3 20.2	N/A	71%
Weiss Lake	1(R) 1(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	25	23	Min Max Mean	3.6 55.0 20.7	6.41 47.5 25.0	60%	70%
Weiss Lake	2(R) 8(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	15	23	Min Max Mean	15.2 43.3 19.7	15.5 47.0 32.3	60%	91%
Weiss Lake	3(R) 12(D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	13	23	Min Max Mean	0.0 20.8 8.8	3.7 29.9 14.1	9%	13%
Weiss Lake	4	ADEM/ RWQM Program	24	26	Min Max Mean	1.6 33.6 12.8	1.1 20.8 13.6	29%	8%
Weiss Lake	5 (R) 6 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	1.3 25.4 10.9	4.5 59.3 31.3	20%	67%
Weiss Lake	6 (R) 7 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	0.7 37.2 16.6	39.0 47.53 43.6	40%	100%
Weiss Lake	7 (R) 10 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	8.0 30.5 18.1	13.88 65.2 44.3	40%	67%

APPENDIX 7 Cont.

Chlorophyll-α data for Weiss Lake **(ADEM, Auburn University)**

Weiss Lake	8 (R) 9 (D/F)	ADEM/ RWQM Program ADEM/ Auburn Dig/Feas	10	3	Min Max Mean	1.8 31.6 18.6	28.8 39.0 34.9	50%	100%
Weiss Lake	9	ADEM/ RWQM Program	0	6	Min Max Mean	N/A	28.8 45.9 38.5	N/A	100%
Weiss Lake	12	ADEM/ RWQM Program	0	7	Min Max Mean	N/A	0.5 24.6 15.9	N/A	14%
Weiss Lake	2	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	2.2 33.6 17.0	N/A	50%	N/A
Weiss Lake	3	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	3.2 37.4 17.1	N/A	40%	N/A
Weiss Lake	4	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	2.9 25.4 15.0	N/A	30%	N/A
Weiss Lake	5	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	8.7 34.3 19.1	N/A	40%	N/A
Weiss Lake	11	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	1.8 28.7 14.1	N/A	30%	N/A
Weiss Lake	13	ADEM/ Auburn Dig/Feas	10	0	Min Max Mean	8.0 25.6 15.6	N/A	10%	N/A

R =RWQM Program station number
D/F =Diagnostic/feasibility study station number

APPENDIX 8

Summaries of Upper Coosa Basin Sites with pH and/or Dissolved Oxygen Violations (ADEM, AWW)

Waterbody Name	Station Number	Agency/ Study	Number of Samples		pH			Dissolved Oxygen (DO)		
			pH	DO	Averages		% of samples above or below 6.0-8.5 s.u.	Averages		% of samples below 5.0 mg/L
Weiss Lake	05004071	AWW	32	31	Min Max Mean	7.5 9.5 8.0	3%	Min Max Mean	4.4 11.6 8.3	6%
Weiss Lake	05004072	AWW	32	31	Min Max Mean	7.5 8.3 7.8	0	Min Max Mean	4.0 11.3 8.1	6%
Weiss Lake	05004081	AWW	52	51	Min Max Mean	5.0 9.0 7.7	4%	Min Max Mean	4.9 12.1 9.5	2%
Weiss Lake	05004082	AWW	53	50	Min Max Mean	7.0 9.8 8.0	2%	Min Max Mean	5.0 12.5 9.0	0
Weiss Lake	05004084	AWW	8	7	Min Max Mean	7.5 9.5 8.4	13%	Min Max Mean	3.2 10.0 7.2	29%
Weiss Lake	05004086	AWW	44	42	Min Max Mean	7.0 9.0 7.7	5%	Min Max Mean	4.3 11.2 7.3	10%
Weiss Lake	05004088	AWW	5	5	Min Max Mean	8.0 9.5 8.4	20%	Min Max Mean	5.5 9.7 7.7	0
Weiss Lake	05004094	AWW	27	27	Min Max Mean	7.0 9.0 8.0	22%	Min Max Mean	4.8 11.6 8.8	4%
Coosa	05004092	AWW	10	7	Min Max Mean	7.3 9.3 8.0	10%	Min Max Mean	6.0 9.5 7.9	0
Little River--West Fork	05006001	AWW	35	35	Min Max Mean	5.5 7.3 6.4	6%	Min Max Mean	4.2 13.0 8.8	3%
Little River	05017005	AWW	11	11	Min Max Mean	5.0 7.0 6.0	55%	Min Max Mean	5.5 9.0 8.0	0
Little Terrapin Cr.	05024001	AWW	26	24	Min Max Mean	6.0 7.5 6.5	0	Min Max Mean	0.0 11.0 7.4	21%
Chattooga River	0500404	AWW	54	54	Min Max Mean	7.0 8.5 7.7	0	Min Max Mean	1.5 11.3 6.0	33%
Weiss Lake	05004022	AWW	46	46	Min Max Mean	7.0 8.5 7.7	0	Min Max Mean	3.2 10.0 6.5	22%

APPENDIX 8 Cont.

Summaries of Upper Coosa Basin Sites with pH and/or Dissolved Oxygen Violations (ADEM, AWW)

Waterbody Name	Station Number	Agency/ Study	Number of Samples		pH			Dissolved Oxygen (DO)		
			pH	DO	Averages		% of Samples Above or Below 6.0-8.5 s.u.	Averages		% of Samples below 5.0 mg/L
Weiss Lake	05004023	AWW	103	103	Min Max Mean	7.0 9.0 7.6	2%	Min Max Mean	4.8 11.3 8.2	1%
Weiss Lake	05004024	AWW	9	9	Min Max Mean	6.0 9.0 7.5	11%	Min Max Mean	5.5 14.0 9.7	0
Weiss Lake	05004025	AWW	90	88	Min Max Mean	6.0 9.5 7.8	12%	Min Max Mean	2.9 11.7 8.2	8%
Weiss Lake	05004026	AWW	61	61	Min Max Mean	6.5 8.5 7.8	0	Min Max Mean	3.3 11.0 7.7	5%
Weiss Lake	05004027	AWW	74	74	Min Max Mean	7.0 9.5 8.0	16%	Min Max Mean	3.6 14.6 8.7	8%
Weiss Lake	05004028	AWW	71	70	Min Max Mean	7.0 9.0 7.9	8%	Min Max Mean	4.5 16.8 8.8	3%
Weiss Lake	05004029	AWW	48	48	Min Max Mean	6.5 9.0 7.9	6%	Min Max Mean	0.7 15.0 8.1	15%
Weiss Lake	05004031	AWW	22	22	Min Max Mean	6.5 9.0 7.6	9%	Min Max Mean	0.8 11.0 7.2	14%
Weiss Lake	05004032	AWW	24	24	Min Max Mean	6.8 8.7 7.5	4%	Min Max Mean	2.6 9.2 5.9	21%
Weiss Lake	05004033	AWW	29	29	Min Max Mean	7.0 9.0 7.6	3%	Min Max Mean	1.4 11.0 7.9	10%
Little River	05004041	AWW	7	7	Min Max Mean	7.0 9.5 8.2	43%	Min Max Mean	3.8 10.0 6.5	29%
Mills Creek	05004044	AWW	79	79	Min Max Mean	6.5 9.0 7.6	1%	Min Max Mean	3.8 11.5 7.8	4%
Natural Spring	05024003	AWW	31	30	Min Max Mean	7.0 7.5 7.2	0	Min Max Mean	0 9.0 1.4	93%
Big Terrapin Creek	05024004	AWW	18	18	Min Max Mean	6.5 7.5 7.1	0	Min Max Mean	3.3 11.4 7.6	6%

APPENDIX 8 Cont.

Summaries of Upper Coosa Basin Sites with pH and/or Dissolved Oxygen Violations (ADEM, AWW)

Waterbody Name	Station Number	Agency/ Study	Number of Samples		pH			Dissolved Oxygen (DO)		
			pH	DO	Averages		% of Samples Above or Below 6.0-8.5 s.u.	Averages		% of Samples below 5.0 mg/L
Pole Cat Forge	05024005	AWW	10	9	Min Max Mean	7.5 8.5 7.9	0	Min Max Mean	3.9 9.8 7.1	11%
Straight Creek	05027002	AWW	42	42	Min Max Mean	5.0 6.5 6.2	5%	Min Max Mean	1.1 11.6 8.1	10%
Sharp Branch	05027003	AWW	43	42	Min Max Mean	5.5 6.5 6.2	12%	Min Max Mean	5.6 11.5 8.4	0
Laurel Creek	05027004	AWW	34	34	Min Max Mean	5.5 7.0 5.8	65%	Min Max Mean	2.5 11.8 8.2	18%
Little River West Fork	05027005	AWW	21	21	Min Max Mean	5.5 7.0 6.2	5%	Min Max Mean	6.1 10.8 8.5	0
Little River West Fork	05027006	AWW	20	20	Min Max Mean	4.8 6.5 6.2	15%	Min Max Mean	5.3 12.0 8.9	0
Little River West Fork	05027007	AWW	16	16	Min Max Mean	5.5 6.5 6.1	19%	Min Max Mean	6.1 10.7 8.6	0
Coosa R.	CO-04	ADEM/AU Unpublished	20	20	Min Max Mean	3.4 13.2 9.1	5%	Min Max Mean	6.7 8.1 7.4	0
West Fork Little River	CO-13	ADEM/ Clean Water Strategy	4	4	Min Max Mean	7.2 9.5 8.0	25%	Min Max Mean	6.5 9.4 7.4	0
Wolf Branch	WOB-1	ADEM/ CWA 303(d) Mon.	3	3	Min Max Mean	7.2 9.5 8.03	33%	Min Max Mean	7.5 9.4 8.2	0
East Fork Little River	CO-01	ADEM/ Clean Water Strategy	5	5	Min Max Mean	4.6 9.2 6.8	20%	Min Max Mean	6.5 7.3 6.9	0
Terrapin Creek	CO-16	ADEM/ Clean Water Strategy	5	5	Min Max Mean	7.3 8.9 7.8	20%	Min Max Mean	6.9 8.1 7.3	0
Chattooga River	W-6	ADEM/ Reservoir Trib. Study	3	3	Min Max Mean	7.6 8.5 8.2	0	Min Max Mean	4.2 12.9 8.8	33%
Little River	W-5	ADEM/ Reservoir Trib. Study	3	3	Min Max Mean	6.7 8.2 5.3	0	Min Max Mean	4.9 9.0 7.4	33%

APPENDIX 9

Estimated Sedimentation Rates and Sources Detailed by Subwatershed (ASWCC 1998)

HUC	County	Name	Cropland		Gravel Pits		Mined		Urban		Critical Areas		Gullies		Stream banks		Roadbanks		Woodland		Total Sed
			Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons
030	Cherokee	Upper Chatooga River	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
050	Cherokee	Mills Creek	7241	21.63	0	0.00	0	0.00	0	0.00	7500	22.40	0	0.00	7200	21.51	6900	20.61	4635	13.85	33476
060	Cherokee	Lower Chatooga River	17009	43.12	1400	3.55	18	0.05	4200	10.65	7500	19.02	0	0.00	5100	12.93	2100	5.32	2115	5.36	39442
080	Dekalb	West Fork Little River	960	3.23	0	0.00	10800	36.39	3600	12.13	900	3.03	0	0.00	600	2.02	12000	40.44	210	0.71	29676
100	Cherokee	East Fork Little River	353	1.87	0	0.00	0	0.00	0	0.00	5250	27.74	0	0.00	3750	19.82	480	2.54	9090	48.04	18923
100	Dekalb	East Fork Little River	1339	7.73	0	0.00	825	4.76	2400	13.86	375	2.17	490	2.83	575	3.32	10500	60.64	810	4.68	17314
110	Dekalb	Bear Creek	14040	9.17	0	0.00	79200	51.73	1380	0.90	11700	7.64	2450	1.60	325	0.21	39150	25.57	4860	3.17	153105
120	Cherokee	Little River	464	1.65	840	2.99	0	0.00	0	0.00	3750	13.33	0	0.00	3300	11.73	1320	4.69	18450	65.60	28124
130	Cherokee	Spring Creek	6462	12.92	0	0.00	0	0.00	720	1.44	2250	4.50	0	0.00	4500	9.00	2460	4.92	33615	67.22	50007
140	Cherokee	Yellow Creek	10044	16.53	840	1.38	15	0.02	13500	22.22	1875	3.09	0	0.00	4200	6.91	8040	13.24	22230	36.60	60744
140	Dekalb	Yellow Creek	6750	18.11	0	0.00	7200	19.32	600	1.61	5625	15.09	980	2.63	275	0.74	14850	39.84	990	2.66	37270
180	Cherokee	Coosa River	20853	41.90	0	0.00	0	0.00	3300	6.63	1500	3.01	0	0.00	3750	7.53	7320	14.71	13050	26.22	49773

APPENDIX 9 Cont.

Estimated Sedimentation Rates and Sources Detailed by Subwatershed (ASWCC 1998)

HUC	County	Name	Cropland		Gravel Pits		Mined		Urban		Critical Areas		Gullies		Stream banks		Roadbanks		Woodland		Total Sed
			Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons
200	Cherokee	Spring Creek	35853	32.76	560	0.51	23	0.02	8580	7.84	3750	3.43	0	0.00	7200	6.58	12960	11.84	40500	37.01	109426
220	Calhoun	Upper Terrapin Creek	1308	5.25	0	0.00	1086	4.36	384	1.54	1500	6.02	0	0.00	2355	9.45	18300	73.40	0	0.00	24933
220	Cherokee	Upper Terrapin Creek	3533	18.94	0	0.00	0	0.00	0	0.00	750	4.02	0	0.00	4500	24.12	1680	9.01	8190	43.91	18653
220	Cleburne	Upper Terrapin Creek	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	120000	38.70	19950	6.43	170157	54.87	310107
240	Cherokee	Hurricane Creek	922	4.70	560	2.85	0	0.00	0	0.00	3375	17.19	0	0.00	3600	18.34	6600	33.62	4577	23.31	19634
250	Cherokee	Lower Terrapin Creek	15821	24.46	1120	1.73	0	0.00	0	0.00	2850	4.41	0	0.00	4800	7.42	6600	10.21	33480	51.77	64671
260	Cherokee	Sugar Creek	3864	18.65	0	0.00	0	0.00	0	0.00	2250	10.86	0	0.00	1800	8.69	1920	9.26	10890	52.55	20724
270	Cherokee	Coosa River	12928	53.07	0	0.00	0	0.00	0	0.00	2100	8.62	0	0.00	1050	4.31	2160	8.87	6120	25.13	24358

*Due to the relatively small size of this sub-watershed (6.5 mi²), no Conservation Assessments were completed by the local SWCDs.

APPENDIX 10

Five Year Implementation Schedule for Agricultural BMPs in Cherokee County (Objective 1; Strategy c), as presented in the *FY2000 Clean Water Action Plan Workplan for the Weiss Lake Watershed.* (Cherokee County SWCD)

	Output/Deliverables			Funds Available		Milestones by Year				
	----------$----------									
1. Animal Waste Mgt. Systems	**Number**	**Unit**	**Avg. Cost**	**Federal**	**Non – Federal**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Composters	2	ea.	10,000	12,000	8,000		1	1		
2. Rowcrop Land										
Conservation Tillage	3500	ac.	33.34	70,014	46,676		1750	1750		
3. Livestock										
Pasture/Hayland Planting	260	ac.	180	28,080	18,720		130	130		
4. Alternative Water Sources										
Wells, Springs, Ponds, etc.	5	ea.	3,100	9,300	6,200		3	2		
Troughs	5	ea.	1,000	3,000	2,000		3	2		
Fencing	20,000	lin.ft	0.55	6,600	4,400		10,000	10,000		
5. Forestry										
Tree/Shrub Planting	400	ac.	175	42,000	28,000		200	200		
6. Miscellaneous										
Education/Tours/Demo Administration by SWCD				19,006	12,671					
Total				**$190,000**	**$126,667**					

APPENDIX 11

EPA's Nine Elements of a Watershed Protection Plan

Since this Upper Coosa River Basin Management Plan is broad in scope and scale, development of local watershed based management plans are encouraged and strongly recommended. Many of the strategies in this Plan may be tailored to any of the 33 specific subwatersheds in the Upper Coosa Basin, to local communities, and to site-specific or unique problems. In addition, this Plan may also be used as a reference to develop new management plans, or as a guidance to initiate or strengthen in-place water quality protection initiatives.

The following guidelines are recommended for stakeholders who choose to develop more narrowly focused subwatershed-based management plans.

Nine Elements of a Watershed Protection Plan

To ensure that management practices make progress towards restoring impaired waters, watershed based protection plans should address the nine elements listed below. Where the watershed plan is also designed to implement a Total Maximum Daily Load (TMDL), inclusion of these elements will provide reasonable assurance that the pollutant load allocations identified in the TMDL or in National Pollutant Discharge Elimination System (NPDES) permits, will be achieved. These nine elements are critical in assuring effective use of public funds to address impaired waters:

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

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

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

4. An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the plan.

Sources of funding may include CWA Section 319, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds that may be available to assist in implementing the plan.

5. An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.

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

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

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

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

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

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

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

geographic subdivisions, or categories of pollutants), consistent with the schedule established pursuant to item (6) above.

River basin plans may be developed in varying levels of scale, scope, and specificity and may contribute significantly to the process of developing and implementing smaller-scale subwatershed protection and TMDL implementation plans. Broad scale river basin plans should be used as building blocks for developing and implementing subwatershed, waterbody, or stream segment-specific plans. Basin-wide plans will generally need to be refined for smaller scale watersheds to provide the information needs for the nine items identified above.

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