Tallapoosa River Basin Management Plan 1998

Georgia Department of Natural Resources
Environmental Protection Division

Georgia River Basin Management Planning Vision, Mission, and Goals

What is the VISION for the Georgia RBMP Approach?

Clean water to drink, clean water for aquatic life, and clean water for recreation, in adequate amounts to support all these uses in all river basins in the state of Georgia.

What is the RBMP MISSION?

To develop and implement a river basin planning program to protect, enhance, and restore the waters of the State of Georgia, that will provide for effective monitoring, allocation, use, regulation, and management of water resources.

[Established January 1994 by a joint basin advisory committee workgroup.]

What are the GOALS to Guide RBMP?

1) To meet or exceed local, state, and federal laws, rules, and regulations. And be consistent with other applicable plans.
2) To identify existing and future water quality issues, emphasizing nonpoint sources of pollution.
3) To propose water quality improvement practices encouraging local involvement to reduce pollution, and monitor and protect water quality.
4) To involve all interested citizens and appropriate organizations in plan development and implementation.
5) To coordinate with other river plans and regional planning.
6) To facilitate local, state, and federal activities to monitor and protect water quality.
7) To identify existing and potential water availability problems and to coordinate development of alternatives.
8) To provide for education of the general public on matters involving the environment and ecological concerns specific to each river basin.
9) To provide for improving aquatic habitat and exploring the feasibility of re-establishing native species of fish.
10) To provide for restoring and protecting wildlife habitat.
11) To provide for recreational benefits.
12) To identify and protect flood prone areas within each river basin, and encourage local and state compliance with federal flood plain management guidelines.

[Established January 1994 by a joint basin advisory committee workgroup.]

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Preface

This report was prepared by the Environmental Protection Division (EPD), Georgia Department Natural Resources (EPD), as required by O.C.G.A. 12-5-520 and as a public information document. It represents a synoptic extraction of the EPD files and, in certain cases, information has been presented in summary form from those files. The reader is therefore advised to use this condensed information with the knowledge that it is a summary document and more detailed information is available in the EPD files.

Comments or questions related to the content of this report are invited and should be addressed to:

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Contents

Section 8

List of Figures

List of Tables

List of Acronyms and Abbreviations

Ac	acre
Ac-ft	acre-feet
ACF	Apalachicola-Chattahoochee-Flint Basin
ACT/ACF	Alabama-Coosa-Tallapoosa/Apalachicola-Chattahoochee Flint Basin
ADEM	Alabama Department of Environmental Management
ARC	Atlanta Regional Commission
ARS	USDA Agricultural Research Service
BMPs	best management practices
BOD	biochemical oxygen demand
CAES	University of Georgia College of Agricultural and Environmental Sciences
Cd	cadmium
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
CPUE	catch per unit effort (fishing)
CRMP	Chattahoochee River Modeling Project
CRP	Conservation Reserve Program
CSGWPP	Comprehensive State Ground Water Protection Plan
CSMTF	Community Stream Management Task Force
CSO	Combined Sewer Overflow
Cu	copper
CWA	U.S. Clean Water Act
DCA	Georgia Department of Community Affairs
DNR	Georgia Department of Natural Resources
DO	dissolved oxygen
EPA	U.S. Environmental Protection Agency
EPD	Georgia Environmental Protection Division
EQIP	Environmental Quality Incentives Program
E&SC	Erosion and Sedimentation Control Act
FEMA	Federal Emergency Management Agency
FFY	Federal fiscal year
FIP	Forestry Incentives Program
FSA	Farm Service Agency
ft	feet
ft^2/d	square feet per day
ft^3/s	cubic feet per second
gal/m	gallons per minute

GDA	Georgia Department of Agriculture
GEMA	Georgia Emergency Management Agency
GFA	Georgia Forestry Association
GFC	Georgia Forestry Commission
GPC	Georgia Power Company
GPD	gallons per day
GSWCC	Georgia Soil and Water Conservation Commission
Hg	mercury
HUC	Hydrologic unit code (USGS)
IBI	Index of Biotic Integrity
kg	kilogram
km^2	square kilometer
kW	kilowatt
LAS	land application system for wastewater
LUST	leaking undeground storage tank
MCL	Maximum Contaminant Level for drinking water
meq/l	milliequivalent
mg/l	milligrams per liter
MG	million gallons
MGD	million gallons per day
mi^2	square miles
ml	milliliter
MLMP	Major Lakes Monitoring Project
MOU	memorandum of understanding
MPN	most probable number (for quantification of fecal coliform bacteria)
MS4	municipal separate stormwater system
M&I	municipal and industrial
NFIP	National Flood Insurance Program
NOI	notice of intent
NPDES	National Pollution Discharge Elimination System
NPS	nonpoint source
NRCS	Natural Resources Conservation Service of USDA
NURE	National Uranium Resource Evaluation
NWI	National Wetlands Inventory (USF&WS)
Pb	lead
PCB	polychlorinated biphenyl
ppm	parts per million; equivalent to mg/l
RBMP	River Basin Management Planning
RBP	Rapid Bioassessment Protocol
RC&D	Resource Conservation and Development Council
RDC	Regional Development Center
RM	river mile
SCS	Soil Conservation Service (now NRCS)
SOCs	Synthetic Organic Chemicals

STATSGO	State Soil Geographic Database (USDA)
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load, as specified in the CWA
TTSI	Georgia combined lake trophic state index
UGA	University of Georgia
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WET	whole effluent toxicity
WHIP	Wildlife Habitat Incentives Program
WPCP	water pollution control plant
WRD	Georgia Wildlife Resources Division
WRP	Wetland Reserve Program
WWTP	wastewater treatment plant
Zn	zinc
µg/l	micrograms per liter
7Q10	7-day average low flow with a once-in-ten-year recurrence interval

Executive Summary

This document presents Georgia's management plan for the Tallapoosa River basin, which is being produced as a part of Georgia's River Basin Management Planning (RBMP) approach. The Georgia Environmental Protection Division (EPD) has developed this plan in cooperation with several other agency partners including the USDA Natural Resources Conservation Commission, Georgia Soil and Water Conservation Commission, Georgia Forestry Commission, U.S. Geological Survey, and Georgia Wildlife Resources Division. The RBMP approach provides the framework for identifying, assessing, and prioritizing water resources issues, developing management strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply.

Purpose of the Basin Plan

The purpose of this plan is to provide relevant information on the characteristics of the Tallapoosa River basin, describe the status of water quality and quantity in the Tallapoosa River basin, identify present and future water resource demands, present and facilitate the implementation of water quality protection efforts, and enhance stakeholder understanding and involvement in basin planning.

This Tallapoosa River Basin Management Plan includes strategies to address a number of different basinwide objectives. These include:

- Protecting water quality in lakes, rivers and streams through attainment of water quality standards and support for designated uses;
- Providing adequate, high quality water supply for municipal, agricultural, industrial, environmental, and other human activities;
- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems;
- Protecting human health and welfare through prevention of water-borne disease; minimization of risk from contaminated fish tissue, and reduction of risks from flooding; and
- Ensuring opportunities for economic growth, development, and recreation in the region.

Achieving these objectives is the responsibility of a variety of state and federal agencies, local governments, business, industry, and individual citizens. Coordination among these many partners can be challenging, and impacts of actions in one locale by one partner on conditions elsewhere in the basin are not always understood or considered. River Basin Management Planning is an attempt to bring together stakeholders in the basin to increase coordination and to provide a mechanism for communication and consideration of actions on a broad scale to support water resource objectives for the entire basin. RBMP provides the framework to begin to understand the consequences of local decisions on basinwide water resources.

This river basin plan will serve as the road map for managing the water resources in the Tallapoosa River basin over the next five years. It contains useful information on the health of the Tallapoosa River basin and recommended strategies to protect the basin now and into the future.

Tallapoosa River Basin Characteristics

The Tallapoosa River basin is located in the northwest part of Georgia, occupying an area of 700 square miles in Georgia, and is the upstream end of a larger basin which extends into Alabama., eventually joining the Coosa River to form the Alabama River. The basin terrain is characterized by rolling hills.

Water Resources

The surface water resources of the basin include two rivers and their tributaries: the Tallapoosa River and the Little Tallapoosa River. There are no major reservoirs within the Georgia part of the basin; however, the basin drains into Harris Reservoir in Alabama, and thence into Lake Martin.

Biological Resources

The basin is almost entirely within the Upper Piedmont land resource area, and supports a diverse mix of terrestrial and aquatic habitats. These habitats are home to a wide range of species of aquatic and terrestrial wildlife, including at least 72 species of fish, 12 species of amphibians, and several species of freshwater molluscs. Several of these species are currently threatened or endangered.

Population and Land Use Characteristics

Nearly 100,000 people live in the Georgia portion of the basin. The major population centers include Bremen, Villa Rica, and Carrollton. The population is expected to increase slowly over the next several decades at a rate of a little less than 1 percent per year.

Almost 70 percent of the basin is covered by forests, and forestry-related activities account for a major part of the basin's economy. Agriculture is also a significant land use activity supporting a variety of animal operations and commodity production. Although the total farmland in the basin is declining, livestock and poultry production is strong.

Local Governments and Planning Authorities

The local governments in the basin consist of counties and incorporated municipalities. The Tallapoosa basin includes portions of five Georgia counties (Carroll, Haralson, Paulding, Heard, and Polk). These counties are members of two Regional Development Centers. There are also 19 incorporated municipalities in the basin.

Water Quantity Conditions

Surface water supplies in the basin include water in rivers, ponds, and small reservoirs. There are no major impoundments in the Georgia portion of the basin, although construction of a regional water supply reservoir has been proposed. While the majority of municipal and industrial water supply comes from surface sources, ground water supplies are locally significant where the aquifers are predominantly carbonate and fractured sandstone. Georgia's Drinking Water Program oversees 16 active and permitted public water systems in the Tallapoosa River basin. The Tallapoosa also supplies water to neighboring counties in Alabama.

The primary demands for water supply in the basin include municipal and industrial use, agricultural use, and recreation. Both municipal/industrial and agricultural demands are expected to increase over the next several decades. Current water supplies in the basin are not expected to be adequate to meet future demands under drought conditions without construction of additional storage capacity or further conservation or reuse efforts.

Water Quality Conditions

The major environmental stressors that impair or threaten water quality in the Tallapoosa River basin include traditional chemical stressors, such as metals and bacterial contamination, as well as less traditional stressors, such as stream channel modifications and alteration of physical habitat.

Significant potential sources of environmental stressors in the basin include point source discharges such as municipal and industrial wastewater; and nonpoint sources that result from diffuse runoff from urban and rural land uses. Based on EPD's 1996-1997 water quality assessment report, urban and rural nonpoint source runoff are now the most frequent cause of failure to support designated uses of water bodies in the Tallapoosa basin.

Point Sources

Point sources are defined as the permitted discharges of treated wastewater to river and tributaries that are regulated under the National Pollutant Discharge Elimination System (NPDES). These permits are issued by EPD for wastewater discharges and storm water discharges.

Municipal discharges. There are currently 7 permitted municipal wastewater discharges in the Tallapoosa basin, although all but one are minor discharges with flow less than 1 million gallons per day. EPD monitors compliance of these permits and takes appropriate enforcement action for violations. As of the 1996-1997 water quality assessment, 1 stream segment (totaling 1 mile) was identified in which municipal discharges contributed to a failure to support designated uses. All water quality standards violations due to permitted municipal discharges are being addressed through the NPDES permitting process.

Industrial discharges. At this time, there are no major industrial wastewater dischargers in the basin, although there are several minor discharges. EPD identified 3 stream segments (totaling 5 miles) where industrial sources contributed to a failure to support designated uses. One segment impacted by a permitted industrial discharge was addressed by elimination of the discharge. Two segments in the Carrollton area are impaired by residual contamination resulting from historical discharges of metals from Southwire Corporation. The permittee has conducted extensive studies of the site and is engaged in cleanup operations to address problems.

Permitted storm water discharges. Urban storm water runoff in the Tallapoosa basin has been identified as a significant source of water quality impairment. Urban runoff which is collected by storm sewers is now subject to NPDES permitting and control. However, only municipal areas with populations greater than 100,000 were regulated under Phase 1 of the Federal stormwater regulations. As a result, there are no municipal separate stormwater (MS4) permits in the Tallapoosa basin at this time.

Nonpoint Sources

Nonpoint sources of pollution include a variety of pollutants that are carried across the ground with rainwater or snowmelt and are deposited in water bodies. The alteration of habitat and the channelization of streams also are considered forms of nonpoint source pollution. The 1996-1997 water quality assessment results for the Tallapoosa basin indicate that urban and rural nonpoint sources contribute to failure to support designated uses of water bodies. The major categories of nonpoint source pollution in the basin include the following:

- Urban, industrial, and residential sources, which may contribute storm water runoff, unauthorized discharges, oxygen-demanding waste, oil and grease, nutrients, metals, bacteria, and sediments.
- Agricultural sources, which may contribute nutrients from animal wastes and fertilizers, sediment, herbicides/pesticides, and bacteria and pathogens.
- Forestry activities, which may contribute sediments and herbicides/pesticides.

Support of Designated Uses

Under Georgia regulations, designated uses and associated water quality standards provide goals for water quality protection. Most of the water bodies assessed in the Tallapoosa River basin support or partially support their designated uses. EPD assessed the streams and major lakes in the Tallapoosa basin and reported the results in *Water Quality in Georgia, 1996-1997*. This assessment indicated that 15 out of 25 evaluated stream segments (86 miles) fully supported uses, and 5 out of 25 (12 miles) partially supported uses, while 5 out of 25 (48 miles) did not support designated uses.

Key Environmental Stressors

The major threats to water quality in the Tallapoosa River basin are summarized below.

Fecal coliform bacteria. The 1996-1997 water quality assessments indicate that violations of water quality standards for fecal coliform bacteria were the most commonly listed cause of failure to support designated uses. Fecal coliform bacteria concentrations contributed to lack of full support on 43 miles, constituting 5 stream segments. Fecal coliform bacteria may arise from point and nonpoint sources, such as wastewater treatment plants, agricultural nonpoint sources, leaking septic systems, and storm water runoff. As point sources have been brought under control and the CSOs eliminated in the basin, nonpoint sources have become increasingly important as potential sources of fecal coliform bacteria.

Metals. The 1996-1997 water quality assessments indicate that violations of water quality standards for metals (e.g., lead, copper, zinc, cadmium) were the second most commonly listed cause of failure to support designated uses. Metals concentrations contributed to lack of full support on 14 miles, constituting 3 stream segments. These metal concentrations are attributed to nonpoint runoff and residuals from past industrial discharges.

Nutrient loading. Nutrient loading is an important issue for Harris Reservoir, downstream of the Georgia portion of the basin in Alabama. Excess nutrient loads can promote undesirable growth of algae and degradation of water quality. A lake receives nutrients from the entire watershed upstream. The major sources of nutrient loading in the Tallapoosa basin are agricultural runoff, urban runoff, storm water, and wastewater treatment facilities.

Flow and Temperature Modification. Stream flow and temperature affect the kinds of organisms able to survive in the water body. Temperature is critical to support of cold-water trout fisheries. Stream flow and temperature also affect how much oxygen is available to the organisms. The primary threats to temperature regime in streams of the Tallapoosa basin are warming by small impoundments, increases in paved surface area, and the removal of trees which provide shade along stream banks.

Sediment Loading and Habitat Degradation. A healthy aquatic ecosystem requires a healthy physical habitat. The major cause of disturbance to stream habitats is erosion and sedimentation. As sediment is carried into the stream, it changes the stream bottom, and smothers sensitive organisms. Trout waters are particularly sensitive to sedimentation in streams. Turbidity associated with sediment loading also impairs recreational and drinking water uses. Sediment loading is of greatest concern in developing areas and major transportation corridors. The rural areas of the basin are of lesser concern with the exception of rural unpaved road systems, areas where cultivated cropland exceeds 20 percent of the total land cover, and areas in which foresters are not following appropriate management practices.

Strategies for Water Supply

Water quantity concerns in the Tallapoosa River Basin are driven by the extreme low flows that have occurred during past droughts. Public water supplies in the basin are dependent on surface water, but basin characteristics create a situation in which drought flows may be very low. Water supply in the Tallapoosa basin will not be sufficient in the long term (year 2020 and beyond) to meet expected municipal/industrial and agricultural demands unless water is either imported from another basin or additional storage or additional conservation and reuse efforts are provided.

The West Georgia Regional Water Authority is leading the effort to develop a proposed major regional reservoir project in the Tallapoosa Basin. This proposed reservoir could supply water to Haralson, Carroll, Paulding, Douglas and Polk counties.

ACT/ACF Allocations. Water quantity within the Tallapoosa basin is also subject to interstate agreements. In 1990, the State of Alabama, concerned about the availability of water for its future needs, filed suit in U.S. District Court to prevent the Corps of Engineers from reallocating water from Lakes Lanier, Carters, and Allatoona to increase the water supply for metropolitan Atlanta; Florida later joined this suit. Under a letter of agreement signed by the three states and the Corps, the ACT/ACF (Alabama- Tallapoosa-Tallapoosa/ Apalachicola-Chattahoochee-Flint) Comprehensive Study was initiated in 1991. In 1997 the three state legislatures approved separate Interstate Compacts which establish the legal and functional basis for future management of the ACT and ACF basins. The President signed the compacts on November 20, 1997.

The compacts require that water allocations be developed before the end of 1998. Obviously the allocation for the ACT Basin will have a potentially significant effect on water resource planning in the Tallapoosa basin in Georgia. It is expected that the allocation will establish some form of commitment for Georgia to allow certain quantities of water to pass downstream for use by Alabama. Such a commitment will not establish how the water may be used within Georgia; those decisions will remain the prerogative of Georgia's governments and citizens. However, it is possible that there may be limitations on quantities of water which will be available for various uses in the Tallapoosa basin.

Strategies for Water Quality

Water quality in the Tallapoosa River basin is generally good at this time, although problems remain to be addressed and proactive planning is needed to protect water quality into the future. Many actions have already been taken to protect water quality. Programs implemented by federal, state, and local governments, farmers, foresters, and other individuals have greatly helped to protect and improve water quality in the basin over the past twenty years.

The primary source of pollution that continues to affect waters of the Tallapoosa River basin results from nonpoint sources. These problems result from the cumulative effect of activities of many individual landowners or managers. Population is growing every year, increasing the potential risks from nonpoint source pollution. Growth is essential to the economic health of the Tallapoosa River basin, yet growth without proper land use planning and implementation of best management practices to protect streams and rivers can create harmful impacts on the environment.

Because there are many small sources of nonpoint loading spread throughout the watershed, nonpoint sources of pollution cannot effectively be controlled by state agency permitting and enforcement, even where regulatory authority exists. Rather, control of nonpoint loading will require the cooperative efforts of many partners, including state and federal agencies, individual landowners, agricultural and forestry interests, local county and municipal governments, and Regional Development Centers. A combination of regulatory and voluntary land management practices will be necessary to maintain and improve the water quality of rivers, streams, and lakes in the Tallapoosa River basin.

Key Actions by EPD. The Georgia EPD Water Protection Branch has responsibility for establishing water quality standards, monitoring water quality, river basin planning, water quality modeling, permitting and enforcement of point source NPDES permits, and developing Total Maximum Daily Loads (TMDLs) where ongoing actions are not sufficient to achieve water quality standards. Much of this work is regulatory. EPD is also one of several agencies responsible for facilitating, planning, and educating the public about management of nonpoint source pollution. Nonpoint source programs implemented by Georgia and by other states across the nation are voluntary in nature. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and ground water resources for municipal and agricultural uses, which includes source water assessment and protection activities in compliance with the Safe Drinking Water Act.

Actions being taken by EPD at the state level to address water quality problems in the Tallapoosa River basin include the following:

- **Watershed Assessments and Watershed Protection Implementation Plans**. When local governments propose to expand an existing wastewater facility, or propose a new facility with a design flow greater than 0.5 million gallons per day, EPD requires a comprehensive watershed assessment and development of a watershed protection implementation plan.
- **Total Maximum Daily Loads (TMDLs)**. Where water quality sampling has documented water quality standards violations and ongoing actions are not sufficient to achieve water quality standards, a TMDL will be established for a specific pollutant on the specific stream segment in accordance with EPA guidance.
- **Source Water Protection**. Most of the public water supply in the Tallapoosa basin is drawn from surface water. To provide for the protection of public water supplies, Georgia EPD is developing a Source Water Assessment Program in alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding recent EPA initiatives.
- **Fish Consumption Guidelines**. EPD and the Wildlife Resources Division work to protect public health by testing fish tissue and issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Key Actions by Resource Management Agencies. Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide non-regulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs.

Agriculture in the Tallapoosa River basin is a mixture of livestock and poultry operations and commodity production. Key partners for controlling agricultural nonpoint source pollution are the Soil and Water Conservation Districts, Georgia Soil and Water Conservation Commission, and the USDA Natural Resources Conservation Service. These partners promote the use of environmentally-sound Best Management Practices (BMPs) through education, demonstration projects, and financial assistance.

Forestry is a major part of the economy in the Tallapoosa basin and commercial forest lands represent almost 70 percent of the total basin land area. The Georgia Forestry Commission (GFC) is the lead agency for controlling silvicultural nonpoint source pollution. The GFC develops forestry practice guidelines, encourages BMP implementation, conducts education, investigates and mediates complaints involving forestry operations, and conducts BMP compliance surveys.

Key Actions by Local Governments. Addressing water quality problems resulting from nonpoint source pollution will primarily depend on actions taken at the local level. Particularly for nonpoint sources associated with urban and residential development, it is only at the local level that regulatory authority exists for zoning and land use planning, control of erosion and sedimentation from construction activities, and regulation of septic systems.

Local governments are increasingly focusing on water resource issues. In many cases, the existence of high quality water has not been recognized and managed as an economic resource by local governments. That situation is now changing due to a variety of factors, including increased public awareness, high levels of population growth in many areas resulting in a need for comprehensive planning, recognition that high quality water supplies are limited, and new state-level actions and requirements. The latter include:

- Requirements for Watershed Assessments and Watershed Protection Implementation Plans when permits for expanded or new municipal wastewater discharges are requested;
- Development of Source Water Protection Plans to protect public drinking water supplies;
- Requirements for local comprehensive planning, including protection of natural and water resources, as promulgated by the Georgia Department of Community Affairs.

In sum, it is the responsibility of local governments to implement planning for future development which takes into account management and protection of the water quality of rivers, streams, and lakes within their jurisdiction. One of the most important actions that local governments should take to ensure recognition of local needs while protecting water resources is to participate in the basin planning process, either directly or through Regional Development Centers.

Continuing RBMP in the Tallapoosa River Basin

This basin plan represents one step in managing the water resources in the Tallapoosa basin. EPD, its resource management agency partners, local governments, and basin stakeholders will need to work together to implement the plan in the coming months and years. Additionally, the basin planning cycle provides the opportunity to update management priorities and strategies every five years. The Tallapoosa River basin team and local advisory committee will both be reorganized in April to June of 2000 to initiate the next iteration of the cycle. Agencies and organizations with technical expertise, available resources, and potential implementation responsibilities are encouraged to become part of the basin team. Other stakeholders can stay involved through working with the local advisory committee, and participating in locally initiated watershed planning and management activities. The next scheduled update of the Tallapoosa River basin plan is planned for mid-summer 2004.

In This Section

- What Is the Purpose of This Plan?
- What's Inside?
- How Do I Use This Plan?
- What Is the Schedule of Activities for the Tallapoosa River Basin?
- How Do Stakeholders Get Involved in the Basin Planning Process?
- What's Next?

Section 1

Introduction

What Is the Purpose of This Plan?

This document presents Georgia's river basin management plan for the Tallapoosa River, which is being produced as a part of Georgia's River Basin Management Planning (RBMP) approach. The purpose of this plan is to provide relevant information on the Tallapoosa River basin characteristics, describe the status of water quality and quantity in the Tallapoosa River basin, identify present and future water resource demands, present and facilitate the implementation of water protection efforts, and enhance stakeholder understanding and involvement in basin planning.

This plan has been produced by the Georgia Department of Natural Resources Environmental Protection Division (EPD), based on data and information gathered by EPD, other state and federal agencies, universities, utilities, consultants, and environmental groups. A basin team made up of representatives from the Georgia Soil and Water Conservation Commission (GSWCC), the Natural Resources Conservation Service (NRCS), Georgia Department of Natural Resources Wildlife Resources Division (WRD), Georgia Forestry Commission (GFC), and EPD's Water Resources Management Branch, Water Protection Branch and Geologic Survey Branch compiled the information to generate the plan. The U.S. Geological Survey (USGS) and the EPD Geologic Survey Branch created the majority of the figures in this report using geographic information system technologies.

River Basin Management Planning

RBMP is designed to coordinate management of water quantity and quality within river basins by integrating activities across regulatory and non-regulatory programs (Appendix A). The RBMP approach provides the framework for identifying, assessing, and prioritizing water resources issues, developing management strategies, and providing opportunities for targeted, cooperative actions to reduce pollution, enhance aquatic habitat, and provide a dependable water supply. RBMP includes opportunities for stakeholders in the State's river basins to participate in developing and implementing river basin management plans. These plans will benefit from the collective experience and combined resources of a variety of stakeholders.

A separate document is available from Georgia EPD that describes the RBMP approach in greater detail.

Initial Efforts for the Tallapoosa River Basin

Begun in 1993, RBMP is a new approach to the management of Georgia's water resources. This is the first river basin management plan produced under RBMP for the Tallapoosa River (Figure 1-1). Under the RBMP approach, the Tallapoosa River plan will be updated every five years. During the first iteration of RBMP in Georgia, much effort and resources are being dedicated to making programmatic changes, building the infrastructure of RBMP, cataloging current water management activities and beginning to coordinate with the many agencies, organizations, and individuals that have a stake in river basin management. As a result, some portions of the RBMP cycle have had to be condensed during this first iteration; in particular, it has not been possible to spend as much effort on developing management strategies as is planned for future iterations. Future iterations of the basin planning cycle will provide a better opportunity for developing new, innovative, and cost-effective strategies for managing water quality and quantity.

What's Inside?

This plan is organized into the following sections:

Executive Summary

The executive summary provides a broad perspective on the condition of the basin and the management strategies recommended to protect and enhance the Tallapoosa River basin's water resources.

1.0 Introduction

The introduction provides a brief description of Georgia's River Basin Management Planning approach, the planning cycle for the Tallapoosa River basin, opportunities for stakeholder involvement, and a description on how to use this document.

2.0 River Basin Characteristics

This chapter provides a description of the basin and its important characteristics, including boundaries, climate, physiography and geology, geochemistry, soils, surface water resources, ground water resources, biological resources, population and land use, local government and jurisdictions, and water use classifications.

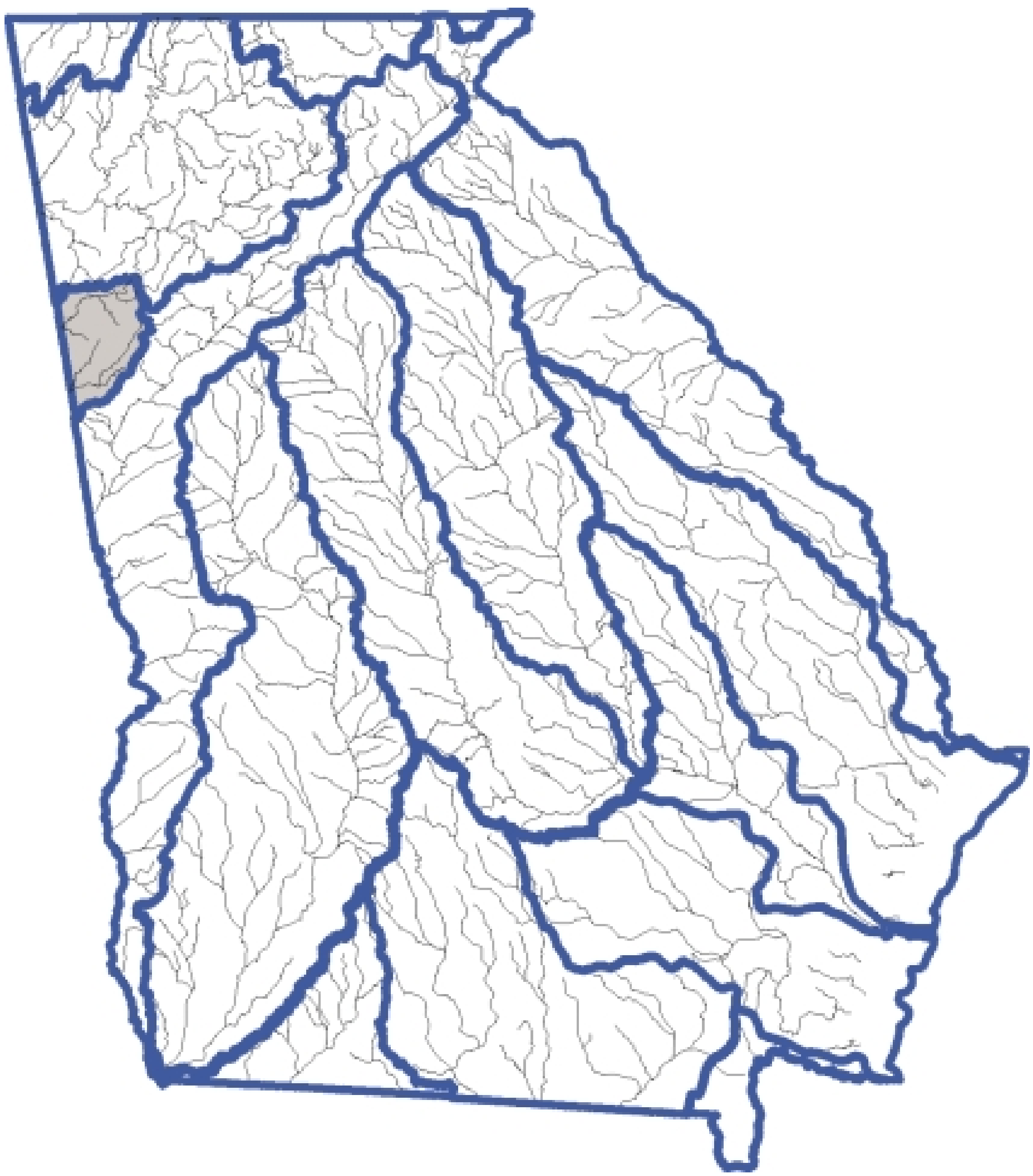

Figure 1-1. The Tallapoosa River Basin

3.0 Water Quantity

This chapter describes current surface and ground water availability, as well as forecasts for future demand. This chapter also includes sections on historic, present and possible proposed permitting activities pertaining to water availability.

4.0 Environmental Stressors

This chapter describes the major stressors in the basin that may impair water or habitat quality. The stressors are divided into point sources (i.e., NPDES permitted discharges) and nonpoint sources.

5.0 Assessment

This chapter provides an assessment of water quality and quantity in the streams, lakes, estuaries, and groundwater along with an assessment of the basin's biological integrity. The data sources and analysis techniques for these assessments are also discussed.

6.0 Concerns and Priority Issues

This chapter summarizes and prioritizes the issues of concern that were identified through the assessment in Chapter 5.

7.0 Implementation Strategies

This chapter presents strategies for addressing the issues of concern in the order that they appear on the priority list in Chapter 6 with a description of each issue, goals and objectives of management, overview of alternatives considered, and descriptions of recommended options for implementation.

8.0 Future Issues and Challenges

This chapter discusses long-range goals to set the stage for further improvements in managing water resources and water quality. Due to limited resources (data, time, funding, etc.), some issues will be addressed in future iterations of each basin planning cycle.

Appendices

The appendices contain technical information for those interested in specific details involved in the planning process.

How Do I Use This Plan?

This river basin plan will serve as the road map for managing the water resources in the Tallapoosa River basin. It contains useful information on the health of the Tallapoosa River basin and recommended strategies to protect the basin now and into the future. The document can be used as a reference tool for watershed conditions in the basin, as well as a planning guide for implementing key actions throughout the basin cycle.

Chapter 7 contains the key management strategies that have been identified to address the priority issues and concerns in the basin. The earlier chapters show the reader how the issues were identified and where the specific stressors in the basin occur. Each chapter in this river basin plan builds upon the previous ones. For example, the recommended management strategies in Chapter 7 were formulated based on the priority concerns identified in Chapter 6. Similarly, the priority issues in Chapter 6 were derived as a result of the assessment in Chapter 5.

Links to Other Chapters

Because issues are discussed across several chapters, an explanatory paragraph at the beginning of chapters 4, 5, 6, and 7 will alert the reader that an issue may be discussed elsewhere. For example, Chapter 4 discusses stressors to the water body from various point and nonpoint sources. Chapter 5 provides an assessment summary of water quality and water quantity based on the sources of environmental stressors. Next, Chapter 6 combines the assessment information from Chapter five to identify priority issues for the development of management strategies. Finally, Chapter 7 provides general goals and strategies to address the most significant existing and future water quality and quantity issues within the Tallapoosa basin.

What Is the Schedule of Activities for the Tallapoosa River Basin?

The schedule of activities for the first two Tallapoosa River basin cycles , i.e., 1995-2000 and 2000-2005, is provided in Figures 1-2 and 1-3. As mentioned earlier, initial scheduling complications and the need to devote resources to development of the RBMP infrastructure have caused the first basin cycle to be somewhat condensed. In the Tallapoosa basin, this has meant that there was not as much time available in the first cycle (1995-2000) to prioritize watersheds and develop management strategies (steps 7 and 8) as there will be once the program converges into a long-term rotating cycle (after 2000). Also, the implementation stage of the first cycle (step 12 in Figure 1-2) is prolonged in order to bring the basin cycle into phase with the long-term rotating cycle, which has the Tallapoosa basin planning cycle beginning in April of 2000 (and every five years thereafter).

This prolonged implementation phase provides an opportunity for the Tallapoosa River basin team and local advisory committee to conduct further outreach activities in order to educate stakeholders about the changes and new opportunities under RBMP. Also, the local advisory committee may wish to use this time to involve stakeholders in a discussion of possible water resources management strategies and the development of infrastructure to support these strategies. For example, this might be a good time to organize small local stakeholder forums that will support the implementation of management strategies (like BMPs) in the next RBMP iteration. EPD considers stakeholder involvement as a continuous process, not limited to scheduled meetings, and encourages stakeholders to provide input and assistance at any time.

How Do Stakeholders Get Involved in the Basin Planning Process?

A major goal of RBMP is to involve interested citizens and organizations in plan development and implementation. This is intended to improve the identification and prioritization of water quality and quantity problems, maximize the efficient use of resources and expertise, create better and more cost-effective management strategies, and be responsive to stakeholder perceptions and needs. The opportunities for stakeholders to get involved in river basin management planning include the following:

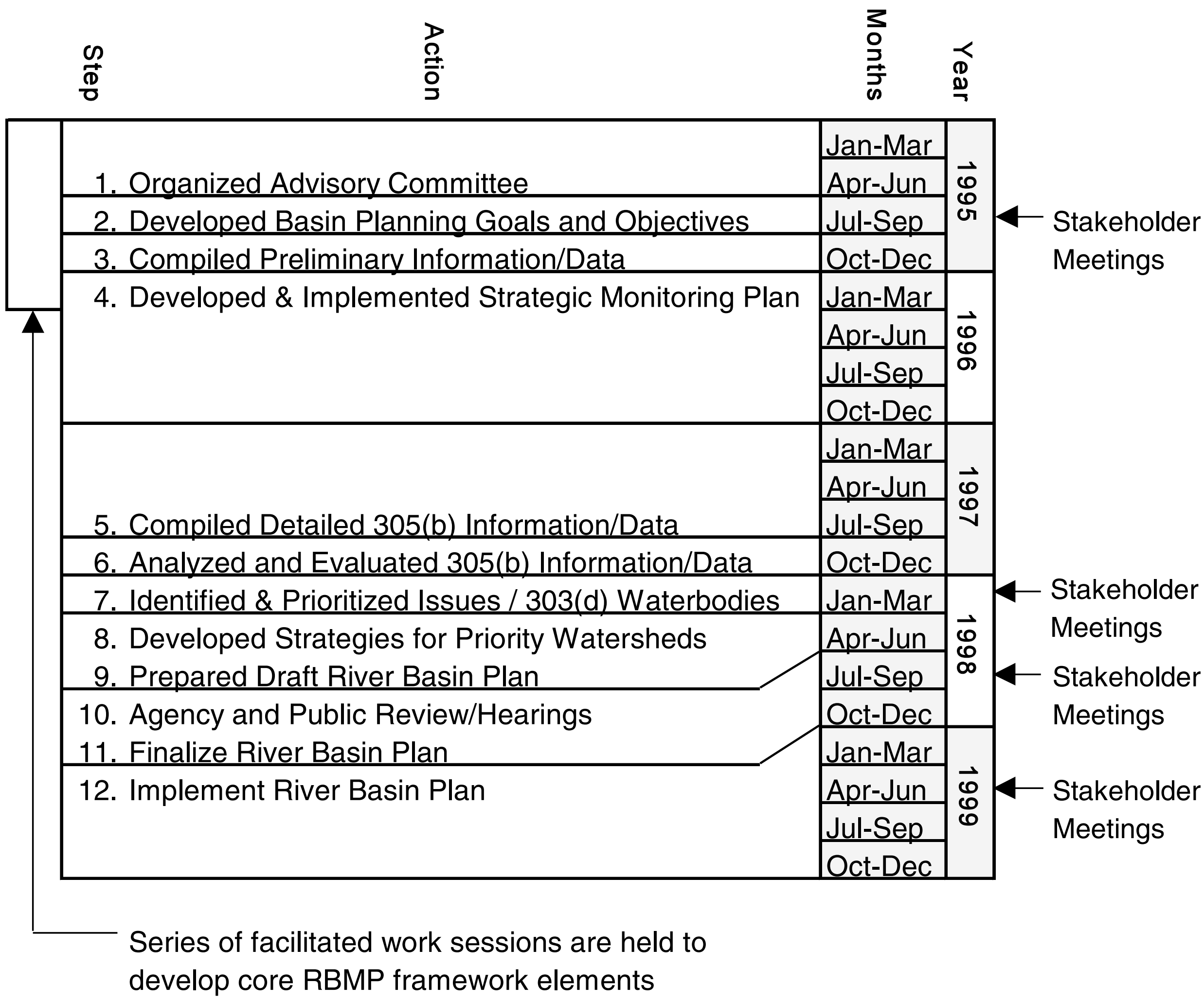

Figure 1-2. Tallapoosa River Basin Planning Schedule, 1st Cycle, 1993-1999

Support the Basin Team

Every basin planning cycle begins with the organization of the basin team. The Tallapoosa River basin team will be reorganizing itself in April to June of 2000.

Members of the basin team are selected from EPD programs and branches, and other interested governmental partners (e.g., the Department of Community Affairs, GFC, GSWCC, NRCS, and WRD). Emphasis is placed on technical knowledge, available resources, and potential implementation responsibilities. Other agencies may act as partners in the RBMP process, contributing resources and expertise, while not being directly involved in Basin Team activities. Support and provide input to the agency that represents your interests.

Support the Local Advisory Committee

The local advisory committees provide advice and counsel to EPD during river basin management plan development, representing a forum for involving local stakeholders. These local advisory committees form a link between EPD and the regulated community and local watershed interests. The local advisory committee will be reorganized simultaneously with the basin teams.

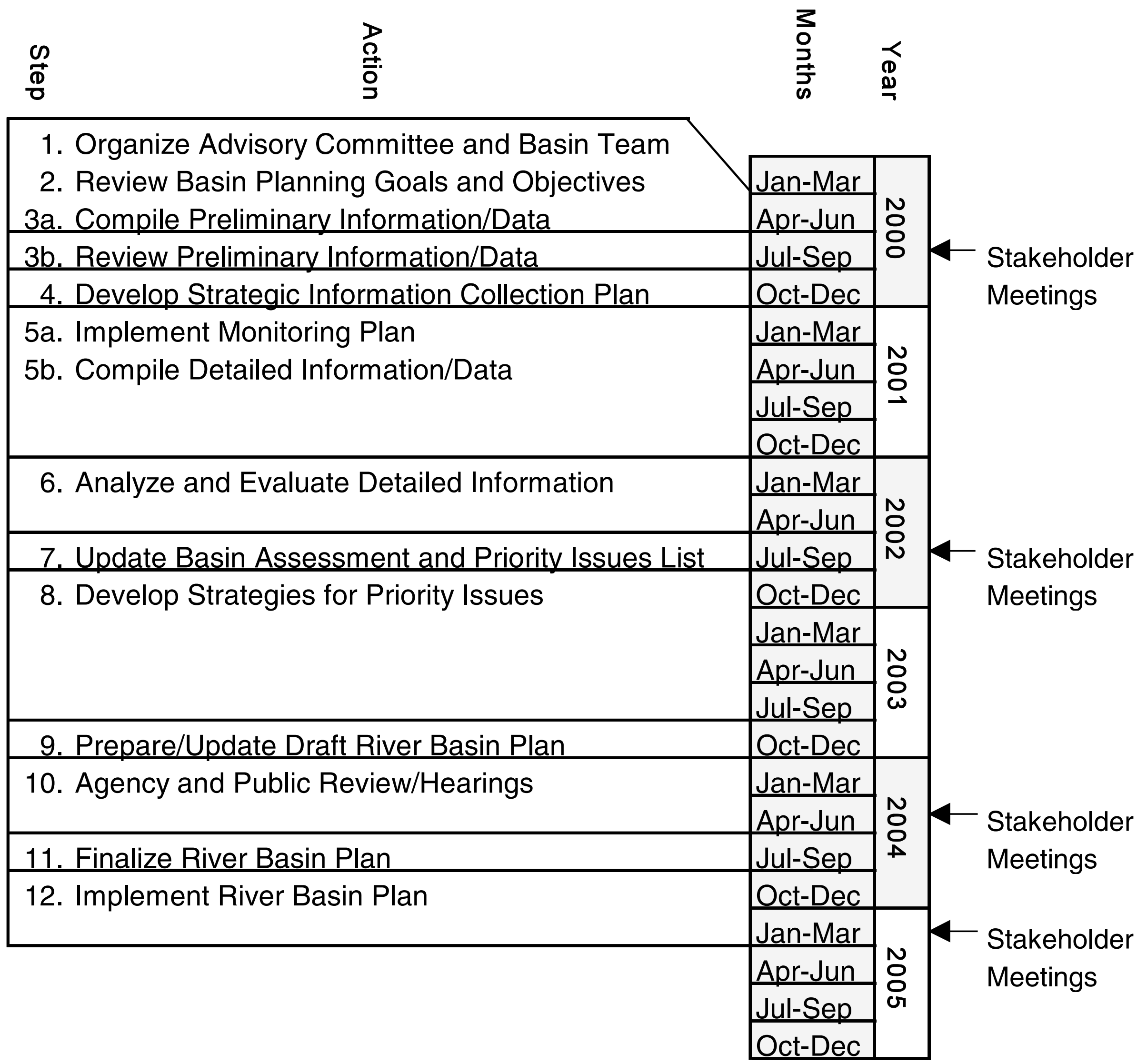

Figure I-3. Tallapoosa River Basin Schedule, 2nd Cycle, 2000-2005

The committees consist of local people representing a variety of stakeholder interests including local governments, agriculture, industry, forestry, environmental groups, landowners, and citizens. Committee members and chairs are appointed by the EPD Director following a nomination process at the beginning (Step 1) of each river basin planning cycle. The committees meet periodically during the planning cycle, and provide input to EPD in the creation of river basin management plans. Meetings are called at the discretion of the chairman of the local advisory committee, and all meetings are open to the public. Table 1-1 lists the members of the Tallapoosa River Basin Local Advisory Committee serving for the first planning cycle (1995-1999). Support and provide input to the committee member who represents your interests.

Table 1-1. Tallapoosa River Basin Local Advisory Committee Members

Mr. Carl Quartermus Georgia Wildlife Federation 104 Tammy Lane Carrollton, GA 30117 Mr. Jim Layton, Executive Director Coosa Valley RDC P.O. Box 1793 Rome, GA 30163-1001 Mr. Rex Boner The Conservation Fund Tucker, GA 30085 Mr. Felton Denney 256 Oak Grove Road Carrollton, GA 30117	Mr. Greg Strenkowski District Water Quality and BMP Coordinator Georgia Forestry Commission 3086 Martha Berry Hwy, NE Rome, GA 30165 Mr. Carl E. Brack, Supervisor West Georgia Soil and Water Conservation District 25 Maple Lane Carrollton, GA 30117 Mr. Gene McCall, Manager Georgia Power Company 26 Head Avenue Tallapoosa, GA 30176	Mr. Norman Heatherington 2011 Georgia Highway 120 Tallapoosa, GA 30176 Mr. Phillip Edison, City Manager 25 East Alabama Street Tallapoosa, GA 30176 Mr. Winfred E. Hill Environmental Director Southwire Company 1 Southwire Drive Carrollton, GA 30119

Participate in Stakeholder Forums

While River Basin Advisory Committees operate at the major basin level, there is an opportunity under RBMP for more localized stakeholder forums to play an important role in the creation and implementation of water resources management strategies. Some strategies, such as best management practices (BMPs) to control pollutant runoff from urban, agricultural or forestry areas, are best managed at the city, county, or sub-watershed level. These local forums might already exist in the form of conservation districts or watershed associations, or may be created as an outgrowth of RBMP.

Attend a Stakeholder Meeting

The RBMP approach includes regularly-scheduled stakeholder meetings, which provide the opportunity for the general public to learn about the status of water-related issues and management activities in their river basin, as well as contribute input that can influence basin management planning.

Figures 1-2 and 1-3 show the timing of stakeholder meetings that have been and will be held as part of the Tallapoosa basin RBMP cycles. The first two stakeholder meetings have already been held for the current planning cycle. EPD hosted an initial stakeholder meeting at Carrollton in July 1995 to invite and encourage stakeholder input early in the planning process for the Tallapoosa River basin. Second stakeholder meeting was held at Carrollton in February 1998 to discuss water quality assessment results, problem areas, and prioritization of actions to address problem areas. A third group of stakeholder meetings—to give stakeholders the opportunity to review this river basin management plan—was held in September 1998. A fourth group of meetings in mid-1999 will give stakeholders a chance to discuss implementation of management strategies. The next set of stakeholder meetings after the implementation phase of the first cycle will be held in mid to late 2000, providing stakeholders an opportunity to be involved in the planning for the next cycle of focused water quality monitoring in the Tallapoosa basin. The dates of ensuing stakeholder meetings are indicated in Figure 1-3.

What's Next?

This plan was reviewed by governmental partners, the Tallapoosa River Basin Advisory Committee, and the public. Public meetings were held to solicit comments and recommendations regarding the river basin management plan. Following the review, appropriate modifications were made to the plan, and the final plan was submitted for review and acceptance by the Board of the Georgia Department of Natural Resources. After approval and an initial implementation period, partners will enter into the next 5-year cycle iteration to evaluate and update the plan as necessary.

In This Section

- River Basin Description
- Population and Land Use
- Local Governments and Planning Authorities
- Water Use Classifications

Section 2

River Basin Characteristics

This section describes the major characteristics of the Tallapoosa River basin including the following:

- *River basin description* (Section 2.1): the physical features and natural processes of the basin.
- *Population and land use* (Section 2.2): the sociological features of the basin, including the types of human activities which may impact water quality and water resource use.
- *Local governments and planning authorities* (Section 2.3): identification and roles of the local authorities within the basin.
- *Water use classifications* (Section 2.4): description of uses and baseline goals for management of waters within the basin as defined in the state regulatory framework.

2.1 River Basin Description

This section describes the important geographical, geological, hydrological, and biological characteristics of the Tallapoosa River basin.

The physical characteristics of the Tallapoosa River basin include its location, physiography, soils, climate, surface water and ground water resources, and natural water quality. These physical characteristics provide the natural template which influences the basin's biological habitats, and the way in which people use the basin's land and water resources.

2.1.1 River Basin Boundaries

The main streams of the Tallapoosa River basin within Georgia are the Tallapoosa River itself and the Little Tallapoosa River. The Tallapoosa River originates in Paulding County west of Atlanta, while the tributary Little Tallapoosa River originates slightly to the south, in Carroll County (Figure 2-1). Across the Georgia-Alabama state line, both

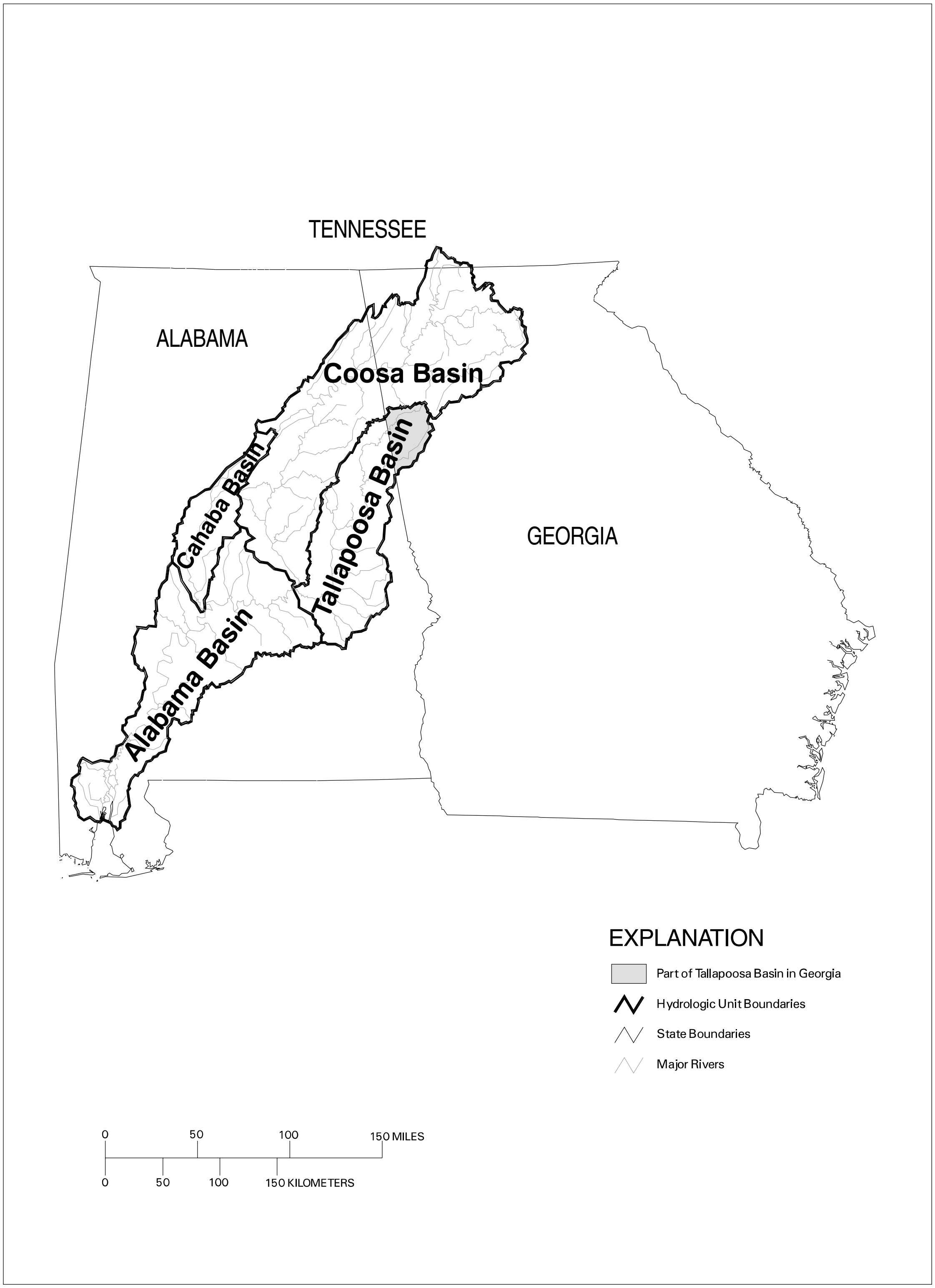

Figure 2-l. Location of the Tallapoosa River Basin

rivers flow through northeast Alabama. The Tallapoosa River basin or watershed, comprising all land areas draining into the river, occupies a total area of 4,680 square miles, of which 720 square miles (15 percent) lie in Georgia, and 3,960 square miles (85 percent) lie in Alabama. Water resources within the Tallapoosa River basin are affected by runoff from all parts of the basin. This plan focuses on management of water resources within the Georgia portion of the basin only. The plan benefits significantly from the basin coordination being accomplished through the ACT-ACF Comprehensive Study.

The U.S. Geological Survey (USGS) has divided the Tallapoosa basin into three subbasins, or Hydrologic Unit Codes (HUCs; see Table 2-1); however, the entire Georgia portion of the watershed is contained within the Upper Tallapoosa HUC. Figure 2-2 shows the location of the basin, the HUC boundaries, and the associated counties within Georgia.

Table 2-1. Hydrologic Unit Codes (HUCs) of the Tallapoosa River Basin

03150108	Upper Tallapoosa Basin (Georgia and Alabama)
03150109	Middle Tallapoosa Basin (Alabama)
03150110	Lower Tallapoosa Basin (Alabama)

2.1.2 Climate

The Tallapoosa River basin is characterized by a moist and temperate climate. Mean annual precipitation ranges from 49 to 53 inches per year. Precipitation occurs chiefly as rainfall, and to a lesser extent, as snowfall. Rainfall is fairly evenly distributed throughout the year, but a distinct dry season occurs from mid-summer to late fall. Rainfall is usually greatest in March and least in October. The mean annual temperature is about 61 degrees Fahrenheit (Journey and Atkins, 1996; citing Peck et al., 1992; Schneider et al., 1965; and Carter and Stiles, 1983).

2.1.3 Physiography, Geology, and Soils

The Tallapoosa River basin is entirely located within the Piedmont physiographic province that extends throughout the southeastern United States. Similar to much of the Southeast, the basin's physiography reflects a geologic history of mountain building in the Appalachian Mountains, and long periods of repeated land submergence in the Coastal Plain province. The Piedmont province is characterized by a well-dissected upland with rounded interstream areas to the north. Prominent topographic features generally reflect erosional and weathering resistance of the underlying geologic units. Stream patterns are dominantly dendritic (Journey and Atkins, 1996).

Geology

The geology of the Tallapoosa River basin strongly influences its physiography, geochemistry, soils, surface and ground water resources. This discussion is adapted from Journey and Atkins (1996).

The Tallapoosa River basin in Georgia lies entirely within the Piedmont province, which is characterized by complex sequences of igneous rocks and metamorphic rocks of late Precambrian to Permian age (Miller, 1990). Collectively, these rocks are called crystalline rocks (Figure 2-3). The metamorphic rocks originally were sedimentary, volcanic, and volcaniclastic rocks that have been altered by several stages of regional metamorphism to slate, phyllite, schist, gneiss, quartzite, and marble. The metamorphic

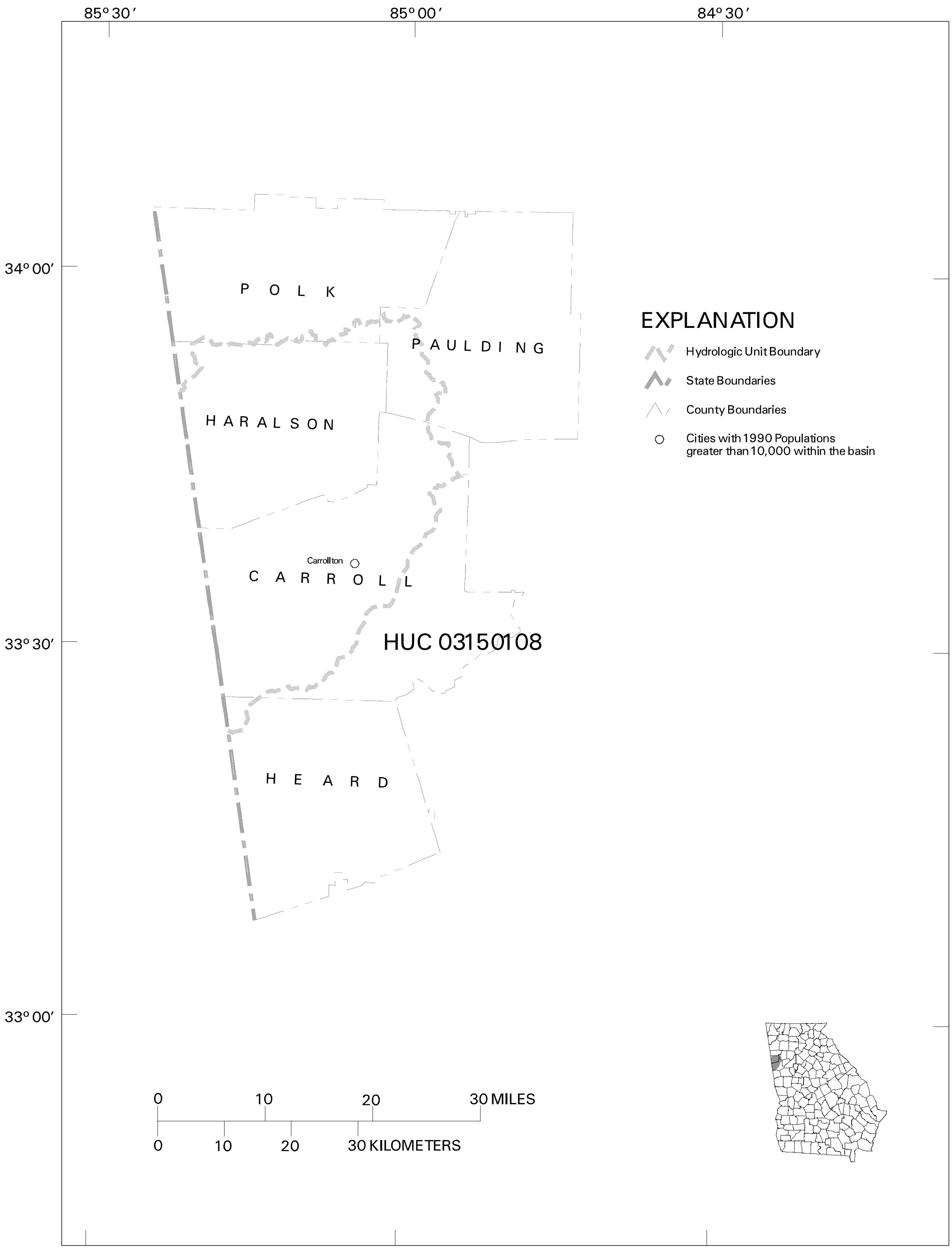

Figure 2-2. Hydrologic Units and Counties of the Tallapoosa River Basin

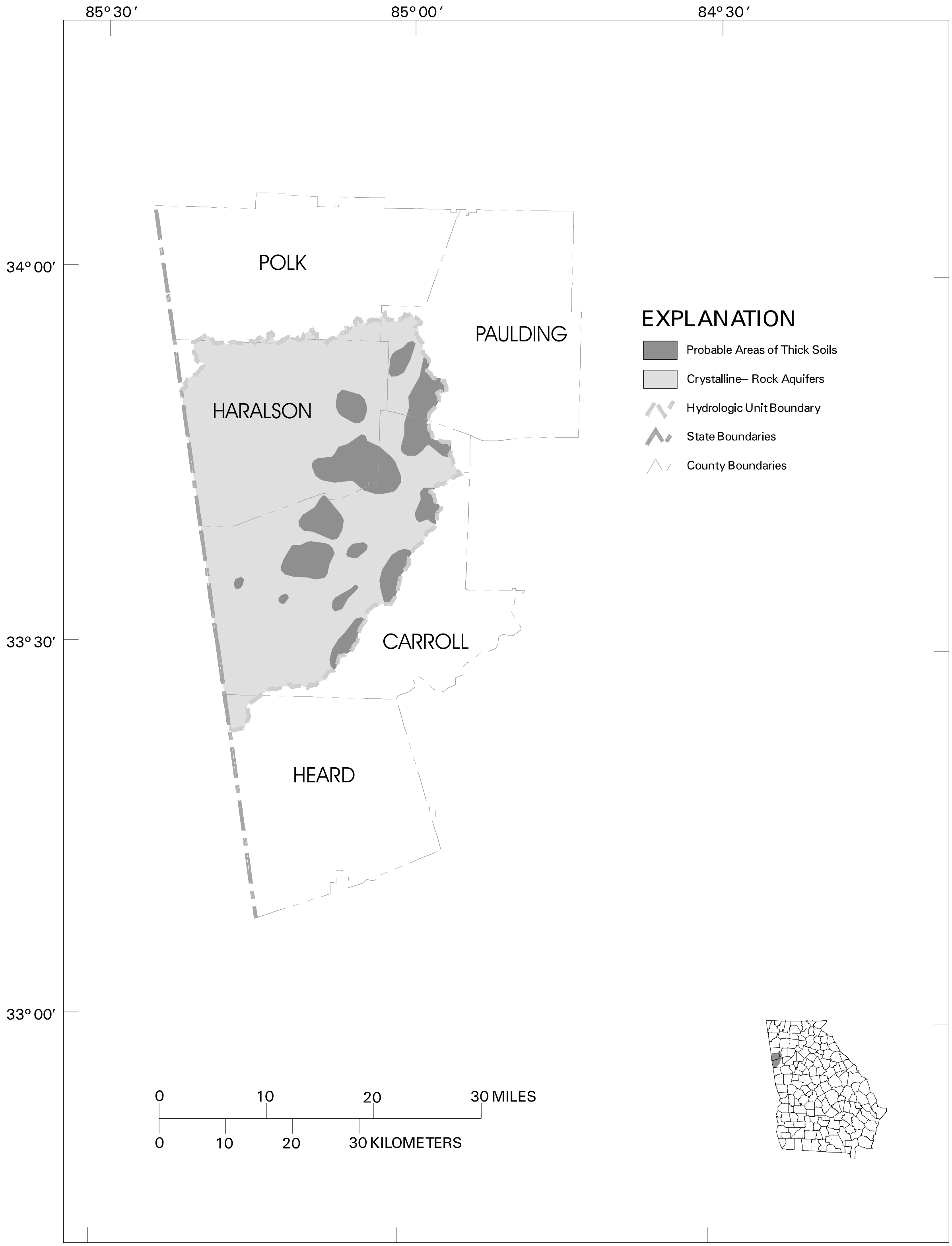

Figure 2-3. Hydrogeologic Units Underlying the Tallapoosa River Basin

rocks are extensively folded and faulted. The intrusive igneous rocks, dominantly granites and lesser amounts of diorite and gabbro, occur as widespread plutons. The rocks are characterized by a complex outcrop and subsurface distribution pattern. Because rock characteristics can vary significantly on the scale of a few tens of feet within the same lithologic unit, detailed geologic-unit differentiation can be accomplished only on the scale of a topographic quadrangle, or larger. The Piedmont contains major fault zones that generally trend northeast-southwest and form the boundaries between the major rock groups.

The crystalline igneous and metamorphic rocks largely are covered by a layer of weathered rock and soil known as regolith. The regolith ranges in thickness from a few to more than 150 feet, depending upon the type of parent rock, topography, and hydrogeologic history. From the land surface, the regolith consists of a porous and permeable soil zone that grades downward into a clay-rich, relatively impermeable zone that overlies and grades into porous and permeable saprolite, generally referred to as a transition zone (Heath, 1989). The transition zone grades downward into unweathered bedrock. In general, the massive granite and gabbro rocks are poorly fractured and are characterized by a thin soil cover. In contrast, the schists and gneisses are moderately to highly fractured. The weathering of the rocks is erratic and usually deep.

Soils

Soils of the Tallapoosa River basin occur almost entirely within the Southern Piedmont major land-resource area (formerly termed a soil province), as shown in Figure 2-4. The soils in the basin developed primarily from gneiss schist, mica schist, and phyllite. The area is characterized by soils that have a gravelly sandy loam surface layer and a yellowish red to red, loamy to clayey subsoil. These soils have a higher content of mica than is typical for the Southern Piedmont; many of the soils have micaceous mineralogy.

The east and southeast portions of the basin have broader ridges and gentler slopes than the northwest portion. Slopes cover a wide range, but most of the area has slopes less than 10 percent. The dominant soils have a deep red clay subsoil. These soils are mostly on the broader ridges. The steeper hillsides in this part of the basin are mostly shallow soils overlying soft bedrock of mica schist and phyllite. These soils have a gravelly fine sandy loam surface layer and a yellowish red loamy subsoil.

The northwest part of the basin has steeper slopes and narrower ridges. Most of the area has slopes greater than 10 percent. The dominant soils have a gravelly fine sandy loam surface layer and a yellowish red loamy subsoil soft bedrock of mica schist and phyllite with bedrock at shallow depths.

2.1.4 Surface Water Resources

The Tallapoosa River rises in northwest Georgia, 40 miles west of Atlanta, at an elevation of about 1,145 feet above mean sea level. It flows in a south-westerly direction for about 195 miles into Alabama and then westerly for 40 miles to join the Coosa River near Wetumpka. Within Georgia, the Tallapoosa River and the Little Tallapoosa River form separate basins of almost equal drainage area. The basin drains a total area of 4,680 square miles, of which 720 square miles are in Georgia and 3,960 square miles are in Alabama. The river, with widths varying from 250 feet to 700 feet, has banks that are 20 feet high along the flood plain. From its source, the river drops at a rate of about 12 feet per mile for 15 miles to elevation 960, a few miles upstream from U.S. Highway 27. It then descends at a more gradual rate of 3.4 feet per mile until it reaches elevation 490 at mile 83, near U.S. Highway 280.

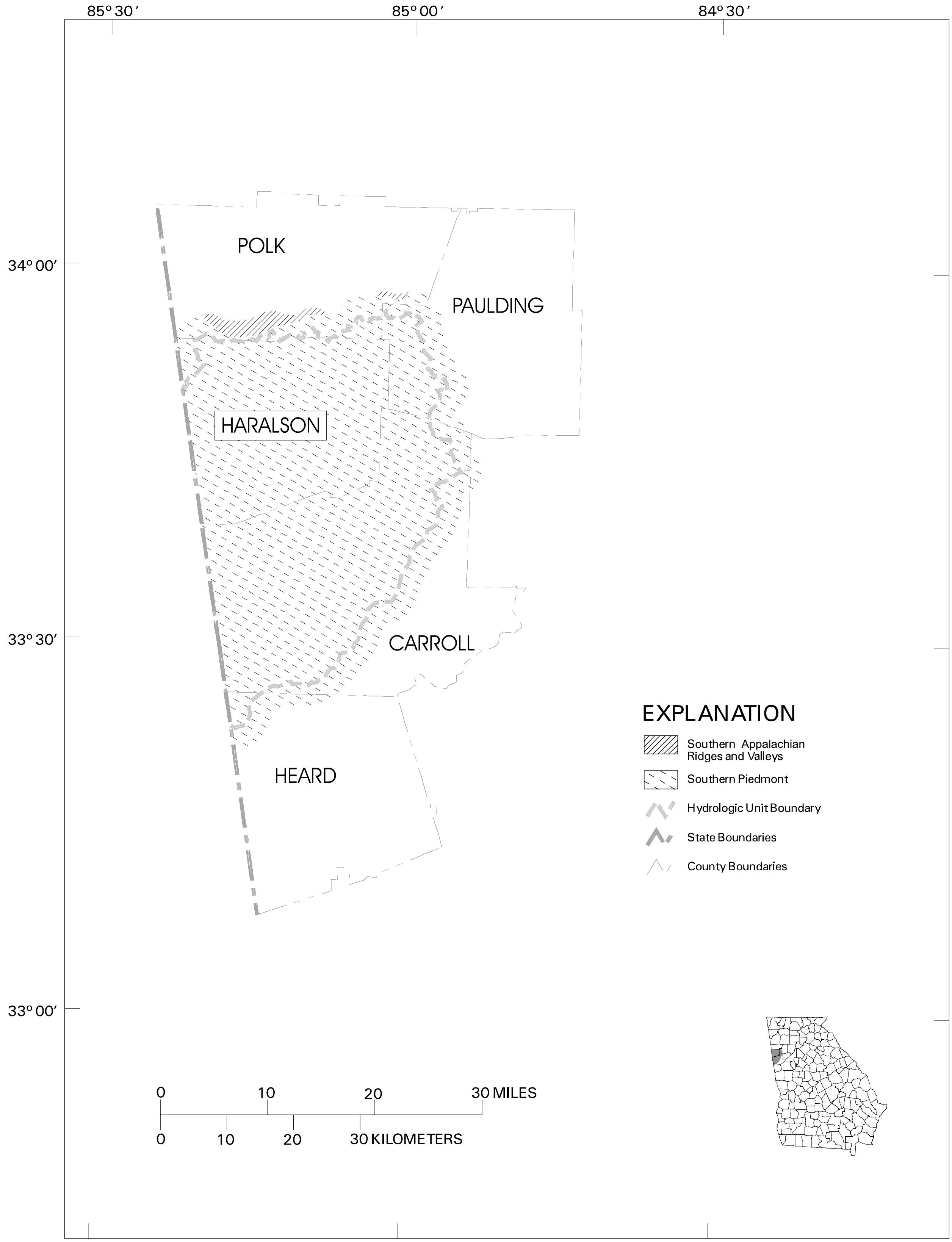

Figure 2-4. Major Land Resource Areas in the Tallapoosa River Basin

Bankfull capacity is approximately 2,500 cubic feet per second in the upper reaches of the river near Heflin, Alabama. At Wadley, Alabama, the bankfull capacity is approximately 22,000 cubic feet per second and it is approximately 60,000 cubic feet per second at Tallassee, Alabama, just below Thurlow Dam. The principal tributary streams are the Little Tallapoosa River, which has a drainage area of 605 square miles in Georgia and Alabama, and Sougahatchee, South Sandy, Uphapee, and Hillabee Creeks in Alabama. The confluence of the Coosa and Tallapoosa Rivers form the Alabama River near Wetumpka, Alabama, and the Alabama and Tombigbee Rivers merge to form the Mobile River near Calvert, Alabama.

Flow Rates of the Tallapoosa River

No continuous record stream gaging stations exist at the Georgia-Alabama border; however Journey and Atkins (1996) estimate that the estimated mean annual stream discharge from Georgia into Alabama is between about 420 and 690 cubic feet per second for the Tallapoosa River and between about 370 and 600 cubic feet per second for the Little Tallapoosa River.

The continuous-record station closest to the Georgia-Alabama State line on the Tallapoosa River is the gage on the Tallapoosa River near Heflin, Alabama (USGS station 02412000), with a mean annual discharge of 689 cubic feet per second over the period of record. Figure 2-5 displays trends in discharge at this station for 1975–1996 as boxplots. Each entry on the plot summarizes daily average flow measurements for a water year. The water year is defined as running from October of the previous calendar year through September of the current year. The center horizontal line marks the median flow for the year, which is the 50th percentile or flow that is exceeded on half of the days in the year. The upper and lower edges of the box represent the 75th and 25th percentiles, respectively. The lines or "whiskers" extending from each box show the range of data, except that high values far above the median are shown as asterisks or circles. Median yearly flows show significant variability, ranging from 169 cfs in 1988 to 747.5 cubic feet per second in 1984 over the last 20 years. The maximum daily average flow observed between 1975 and 1996 was 30,200 cubic feet per second on March 31, 1977, while the minimum was 21 cubic feet per second on October 12–14, 1993. Measures of instantaneous peak flows at this station are available since 1953, with maximum peak flow reported of 32,500 cubic feet per second on 31 March, 1977.

Stream networks within the Georgia portions of the Tallapoosa basin are shown in Figure 2-6.

Reservoirs and Dams

The Alabama Power Company has constructed four dams across the Tallapoosa River. The most upstream project is Harris Dam, located about 15 miles upstream from Wadley, Alabama. Martin, Yates, and Thurlow Dams form continuous impoundments for about 33 miles, across the fall line, upstream from Tallassee, Alabama. The most upstream project is Harris Dam, located about 15 miles upstream from Wadley, Alabama.

The Tallapoosa basin contains no major dams and associated impoundments within Georgia at this time, although the Harris impoundment in Alabama extends into Georgia (Table 2-2). R.L. Harris Dam is located on the Tallapoosa River at river mile 139.1 in Randolph County, Alabama. Construction was completed in April 1983. It is a storage project with normal operating head of 124 feet and a drainage area of 1,453 square miles. The reservoir formed by this dam impounds approximately 424,969 acre-feet at top of summer power pool, of which 207,320 acre-feet is available for power storage. The lake at elevation 793 feet covers 10,661 acres with 271 miles of shoreline.

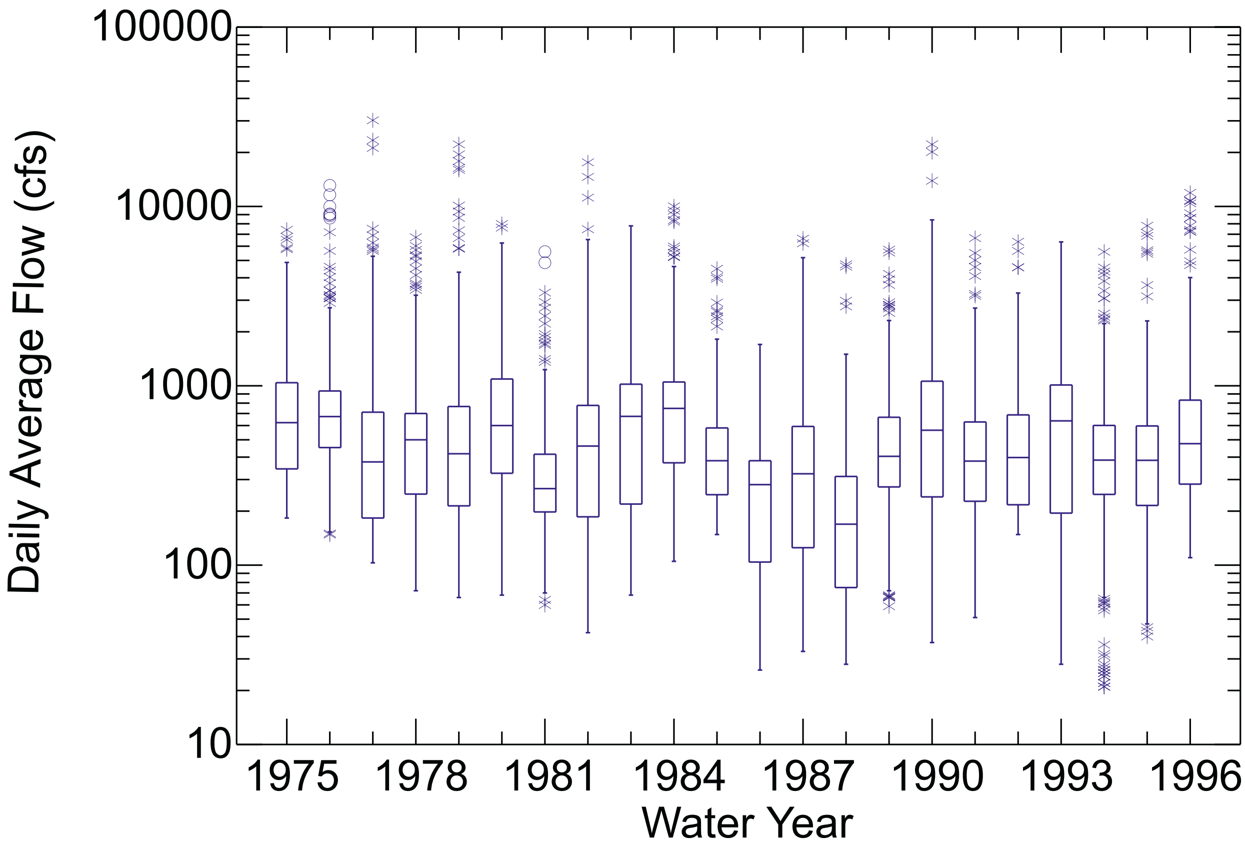

Figure 2-5. Mean Daily Discharge for the Tallapoosa River near Heflin, Alabama (USGS Station 02412000)

Figure 2-6. Hydrography, Tallapoosa River Basin, HUC 03150108

Table 2-2. Major Dams and Impoundments in the Tallapoosa River Basin

Project Name	Drainage Area (Sq. mi.)	Reservoir Size (ac)	Reservoir Storage Volume (ac-ft)	Total Power Capacity (kW)	Normal Lake Elevation (ft)
Harris Dam and Lake	1,453	10,661	425,503	135,000	793
Martin Dam and Lake	3,000	40,000	1,623,000	154,000	490
Yates Dam and Lake	3,300	2,000	53,770	37,000	344
Thurlow Dam and Lake	3,325	574	18,461	58,000	289

2.1.5 Ground Water Resources

The geology of the Tallapoosa River basin determines the ground-water characteristics of the area. Two major types of aquifers underlie the Tallapoosa River basin. These are identified on the basis of their ability to store and yield water as: (1) porous-media, and (2) fracture-conduit aquifers (Journey and Atkins, 1996).

Porous-media Aquifers

Porous-media aquifers typically consist of unconsolidated or poorly consolidated sediments. In these aquifers, ground water moves through interconnected pore spaces between sediment grains. The porous-media aquifers occur in the regolith (soil, alluvium, and saprolite derived from various aged rocks), and are generally suitable for domestic use only.

Fracture-conduit Aquifers

Fracture-conduit aquifers occur in igneous and metamorphic rocks of the Piedmont province. Fracture-conduit aquifers underly the shallower regolith. Within the fracture-conduit aquifers nearly all ground-water movement is through fractured or broken rock and through openings between cleavage plains. Because flow is determined by fracture patterns, these aquifers have distinct local, discontinuous properties. Well yields are variable: 1 to 25 gallons per minute is typical, but yields may exceed 500 gallons per minute. Water quality is generally good.

Within the Piedmont province, ground-water storage is primarily in the overlying weathered rock (regolith or saprolite), while the fracture-conduit aquifer generally has a low storage capacity. The volume of water in storage is controlled by the porosity and thickness of the regolith, which is thicker in marble, schist, gneiss, and in valleys; to a lesser degree, the volume of water in storage is controlled by the amount of fracturing of the rock. Because of the limited storage in fractures, water levels in fracture-conduit aquifers respond rapidly to pumping and to seasonal changes in rainfall (Journey and Atkins, 1996). Annual low water levels generally occur in the fall after the dry summer, and annual high water levels occur in the early spring because of recharge following rainfall during the winter.

Ground Water/Surface Water Interactions

Streamflow is composed of two major components: overland or surface runoff, and baseflow, representing ground water discharge to the stream. Within the Tallapoosa basin, the unit-area mean-annual baseflow due to ground water discharge is estimated to be 0.902 cubic feet per second per square mile. Journey and Atkins (1996) estimate that the mean annual contribution of baseflow to flow in the Tallapoosa River and Little Tallapoosa River at the Georgia-Alabama state line is approximately 534 cubic feet per second, or about 51 percent of the total annual flow.

2.1.6 Biological Resources

The Tallapoosa River basin supports a diverse and rich mix of terrestrial and aquatic habitats and is home to a number of federally and state-protected species. Some of the most important biological resources of the basin are summarized below.

Terrestrial Habitats

The health of aquatic ecosystems is linked to the health of terrestrial ecosystems. All parts of the Tallapoosa River basin have been subjected to varying degrees of forest-cover alteration. Small-scale disturbance of native forests began with American Indians who used fire to create fields for cultivation. Forest disturbance was greatly accelerated by European settlers who logged throughout the basin and extensively cleared land for agriculture.

Prior to European settlement, the Tallapoosa River basin was mostly forested. Native forests in the Piedmont Province were dominantly deciduous hardwoods and mixed stands of pine and hardwoods. The Upper Piedmont region comprises the hilly upland portion of the Piedmont. Streams in this region drain primarily into the Etowah, Tallapoosa, Tugaloo, and upper Chattahoochee rivers. Valleys of this region are intermediate in breadth between the Blue Ridge and the lower Piedmont. Flooding occurs less frequently here than in the lower Piedmont, in part because the headwaters of these streams lie in the mountains, with deep humus soils and abundant vegetation. Soil parent materials are metamorphic rocks of Paleozoic or Precambrian age. Surface soils vary in composition, but subsoils of sandy clay or clay loam are typical. Floodplains are generally narrower and steeper than in the lower Piedmont, and valley forests contain a greater number of northern biotic elements, such as *Quercus rubra, Q. alba, Juglans nigra, Asimina triloba, Magnolia tripetala,* and *Lindera benzoin.*

Wetland Habitats

Wetlands are lands transitional between terrestrial and deep-water habitats where the water table is at or near land surface or the land is covered by shallow water (Cowardin et al., 1979). Most wetlands in the Tallapoosa River basin are forested wetlands located in floodplains of streams and rivers. Forested floodplain wetlands are maintained by the natural flooding regime of rivers and streams, and in turn, influence the water and habitat quality of riverine ecosystems.

Assessments of wetland resources in Georgia have been carried out with varying degrees of success by the Natural Resources Conservation Service (Soil Conservation Service-USDA), the US Fish and Wildlife Service National Wetland Inventory, and Georgia's Department of Natural Resources.

Georgia DNR compiled a wetland mapping database in 1991 which is based on classification of Landsat Thematic Mapper (TM) satellite imagery taken during 1988-1990. Total wetland acreage based on landsat TM imagery is 4761.3 acres or 1.1 percent of land area in the Tallapoosa River basin. These data underestimate the acreage of forested wetlands, where considerable acreage may have been classified as hardwood or mixed forest.

Aquatic Fauna

This section focuses on aquatic or wetland species including fish, amphibians, and aquatic reptiles. However, the Tallapoosa River basin is rich in many other fauna that rely on the water resources of the basin, including many species of breeding birds and mammals. Although a description of these bird and mammal species is beyond the scope of this report, the water needs of these species, such as bald eagles, fish-eating mammals, and migratory water fowl, should be considered in water-resource planning and management.

Fish Fauna

The Tallapoosa River basin supports cold and warm water fisheries. Species important to recreational anglers include largemouth, spotted, and redeye bass; rainbow trout; black crappie; channel catfish; and various species of sunfish. The river is free flowing in Georgia with no major impoundments until it reaches Harris Reservoir in Alabama. However, the West Georgia Reservoir has been proposed for the Georgia portion of the basin, and would significantly alter fish habitat.

Several studies of fish in the Tallapoosa basin have been conducted in conjunction with planning for the proposed West Georgia Reservoir. Beisser (1990) developed an inventory of fish species in the vicinity of the proposed reservoir and identified 72 species inhabiting the drainage based on museum collections and literature citations, of which 46 were confirmed by electrofishing in 1989–1990. Of these, five species are endemic to the Tallapoosa basin and three are rare or exhibit unique distribution patterns in Georgia.

The largest group of species are in the minnow family Cyprinidae. Minnows are small fish that can be seen darting around in streams that are only a few feet wide. Other families with large numbers of species are the sunfish and bass family, the catfish family, and the sucker family. Species that have the largest numbers of individuals living in streams typically are minnows and suckers. These species are often not well known because, unlike sunfish, bass, and catfish, people do not fish for them, although certain minnows may be used as bait. Minnows have an important role in the aquatic food chain as prey for larger fish, snakes, turtles and wading birds such as herons. Suckers can grow to more than one foot long and are named for their down-turned mouth that they use to "vacuum" food from stream bottoms. Although suckers are not popular game fish, they are ecologically important because they often account for the largest fish biomass in streams.

The standing crop of fish in the Tallapoosa River ranged from 57 to 94 kg/ha in spring and summer rotenone samples collected in 1966 (Georgia Game and Fish, 1966; cited in Beisser, 1990). Non-predatory game fish (sunfish) were dominant by weight in the spring sample, while non-predatory food fish (suckers) were dominant in the fall sample.

The Tallapoosa River basin has a number of designated secondary trout waters. Georgia Game and Fish has regularly stocked rainbow trout in Beach Creek, Flatwood Creek, Lassetter Creek, and the mainstem Tallapoosa River. In addition, brook trout have occasionally been stocked in Beach Creek and the mainstem, as well as brown trout and smallmouth bass in the mainstem.

Six fish species occurring within the Tallapoosa River basin have been listed for protection by the State as endangered, threatened, or rare; however, none of these species have been listed at the Federal level (Table 2-3).

Amphibians and Reptiles

The Tallapoosa River basin of Georgia has received relatively little reptile and amphibian collecting attention in the past. As a result, only twelve amphibians (five

Table 2-3. Federal and State Protected Aquatic and Wetland Species in the Georgia Portion of the Tallapoosa River Basin

Common Name	Species	Federal Status	State Status	Ranking
Vertebrate Animals				
Tallapoosa Shiner	*Cyprinella gibbsi*		R	Apparently secure globally; rare or uncommon in state.
Lipstick Darter	*Etheostoma chuckwachattee*		E	Critically imperiled in state because of rarity; global status uncertain.
Tallapoosa Darter	*Etheostoma tallapoosae*		R	Rare or uncommon in state; rare or apparently secure globally.
Stippled Studfish	*Fundulus bifax*		E	Critically imperiled in state because of rarity; globally imperiled or rare.
Pretty Shiner	*Lythrurus bellus*		T	Imperiled in state because of rarity; demonstrably secure globally.
Black Madtom	*Noturus funebris*		R	Imperiled or critically imperiled in state; demonstrably secure globally.
Plants				
Harper Heartleaf	*Hexastylis shuttleworthii var. harperi*		U	Subspecies may be imperiled in state; globally apparently secure.
Monkeyface Orchid	*Platanthera integrilabia*		T	Imperiled or critically imperiled in state; imperiled globally because of rarity.

E: Endangered T: Threatened R: Rare L: Listed P: Proposed U: Unusual salamanders and seven frogs) requiring freshwater for all or part of their life cycle have been documented from this drainage in the state (Williamson and Moulis, 1994). Two additional salamanders that omit an aquatic life-stage, the slimy salamander (*Plethodon glutinosus*) and seepage salamander (*Desmognathus aeneus*), are nevertheless strongly associated with riparian zones of the Georgia Tallapoosa River basin and others. Currently, seventeen undocumented amphibians are quite likely to inhabit this region either due to their occurrence in the adjacent Alabama portions of the Tallapoosa drainage (Mount, 1975) or because they have been reported from Georgia portions of the drainage by participants of the Georgia Herp Atlas Project. Of these 31 amphibian species, six (seepage salamander: *Desmognathus aeneus,* four-toed salamander: *Hemidactylium scutatum,* Alabama waterdog: *Necturus alabamensis,* Webster's salamander: *Plethodon websteri,* mud salamander: *Pseudotriton montanus,* and wood frog: *Rana sylvatica*) are considered of "Special Concern" by the Georgia Natural Heritage Program. No state or federally listed/protected amphibians are likely to occur in this region.

Only two turtle and three snake species comprise the documented reptiles strongly associated with freshwater habitats of the Tallapoosa River basin (Williamson and Moulis, 1994). Six additional turtle species and one additional snake are quite likely to inhabit this region due to their occurrence in the adjacent Alabama portions of the Tallapoosa drainage (Mount, 1975). No state or federally listed/protected reptiles are likely to occur in this region.

Aquatic Macroinvertebrate Fauna

Freshwater mussels provide natural filtration systems that help keep water clean and clear. The southeastern United States is the global epicenter of freshwater molluscan diversity (Burch 1973) and the status of riverine freshwater mussels may be one of the most critical conservation problems in the region (Williams *et al.* 1992; Neves *et al.* 1997). Nearly three-fourths of the southeastern freshwater mussel fauna is federally listed or has candidate species status (Williams *et al.* 1992). At least 21 southeastern mussel species have gone extinct in relatively recent times (Neves *et al.* 1997). Tennessee and Alabama historically contain the most diverse mussel fauna but Georgia, with 98 species in the family Unionidae, has the fourth most diverse mussel fauna of the 50 states (Neves *et al.* 1997). Not much information is available about the mussel fauna of the Tallapoosa basin, but it is likely that the historical species assembly was quite diverse. One species that is listed (federal and state lists) as threatened, the fine-lined pocketbook, has recently been collected in the Tallapoosa River drainage in Alabama (protected species inventory from the ACT-ACF Comprehensive Study).

Several factors have contributed to the decline of freshwater mussels, including their own complicated life-history strategy and the many impacts on riverine habitat. Mussels have parasitic larval stages that generally require specific fish hosts (Watters 1994). Thus, mussel populations can be impacted either directly through habitat degradation or indirectly through impacts on species of fish that serve as hosts. Modification of river channels for shipping, sedimentation from improper land use or inadequate erosion control, and non-point source pollution are the factors most responsible for mussel population declines (Williams *et al.* 1992; Neves *et al.* 1997).

Hobbs (1981) lists six crayfish species, representing two genera, that occur in the Tallapoosa basin. These species fit into the two ecological groups described by Hobbs as stream dwellers and burrowers.

Aquatic and Wetland Vegetation

While the Tallapoosa River basin supports a diverse population of upland plants, wetland areas are limited, while lakes and ponds occur only as a result of man's activities. The

Georgia Natural Heritage Program has identified two "Special Concern" plant species occurring in the Tallapoosa River basin, including species designated as unusual, rare, threatened, or endangered. Among these, there are two wetland species with state threatened or uncommon status (Table 2-3).

2.2 Population and Land Use

2.2.1 Population

As of 1995, about 98,800 people lived in the Georgia portion of the watershed, primarily along the Interstate 20 and US 27 corridors (DRI/McGraw-Hill, 1996). Population centers in the Tallapoosa watershed include Bremen, Villa Rica, and Carrollton. Population distribution in the basin at the time of the 1990 Census by Census blocks is shown in Figure 2-7.

Between 1985 and 1995, the population in the Georgia portion of the Tallapoosa River basin increased by about 1.7 percent per year (DRI/McGraw-Hill, 1996). Basin population is projected to increase at a slower rate of 0.9 percent per year through 2050.

2.2.2 Employment

The Georgia portion of the Tallapoosa River basin supported 36,700 jobs in 1990, dominated by a variety of manufacturing interests. Of the subbasin's 14,000 manufacturing jobs during 1990, more than 40 percent were classified within the durable goods sector. In coming years, large productivity gains are expected to decrease industrial employment at the same time production increases. Between 1990 and 2050, total nonfarm employment is predicted to increase at an annual rate of 0.4 percent in this basin (DRI/McGraw-Hill, 1996).

2.2.3 Land Cover and Use

Land use/land cover classification was determined for the Tallapoosa River basin based on high-altitude aerial photography for 1972-1976 interpreted by the U.S. Geological Survey. In 1991 land cover data were developed based on interpretation of Landsat TM satellite image data obtained during 1988-1990, leaf-off conditions. These two coverages differ significantly. Aerial photography allows identification of both land cover and land uses. Satellite imagery, however, detects primarily land cover, and not land use, such that a forest and a wooded subdivision may, for instance, appear similar. Satellite interpretation also tends to be less accurate than aerial photography.

The 1972-1976 land use classification (Figure 2-8) indicated that 67 percent of the basin land areas was forest, 28 percent was agriculture, and 4 percent was urban land use, with 1 percent in other land uses, including less than 0.3 percent wetlands.

The 1988-1990 land cover interpretation showed 69.8 percent of the basin in forest cover, 1.1 percent in wetlands, 4.1 percent in urban land cover, and 21.9 percent in agriculture, predominantly pasture (Figure 2-9). Statistics for 15 landcover classes in the Georgia portion of the Tallapoosa basin for the 1988-1990 coverage are presented in Table 2-4 (GA DNR, 1996).

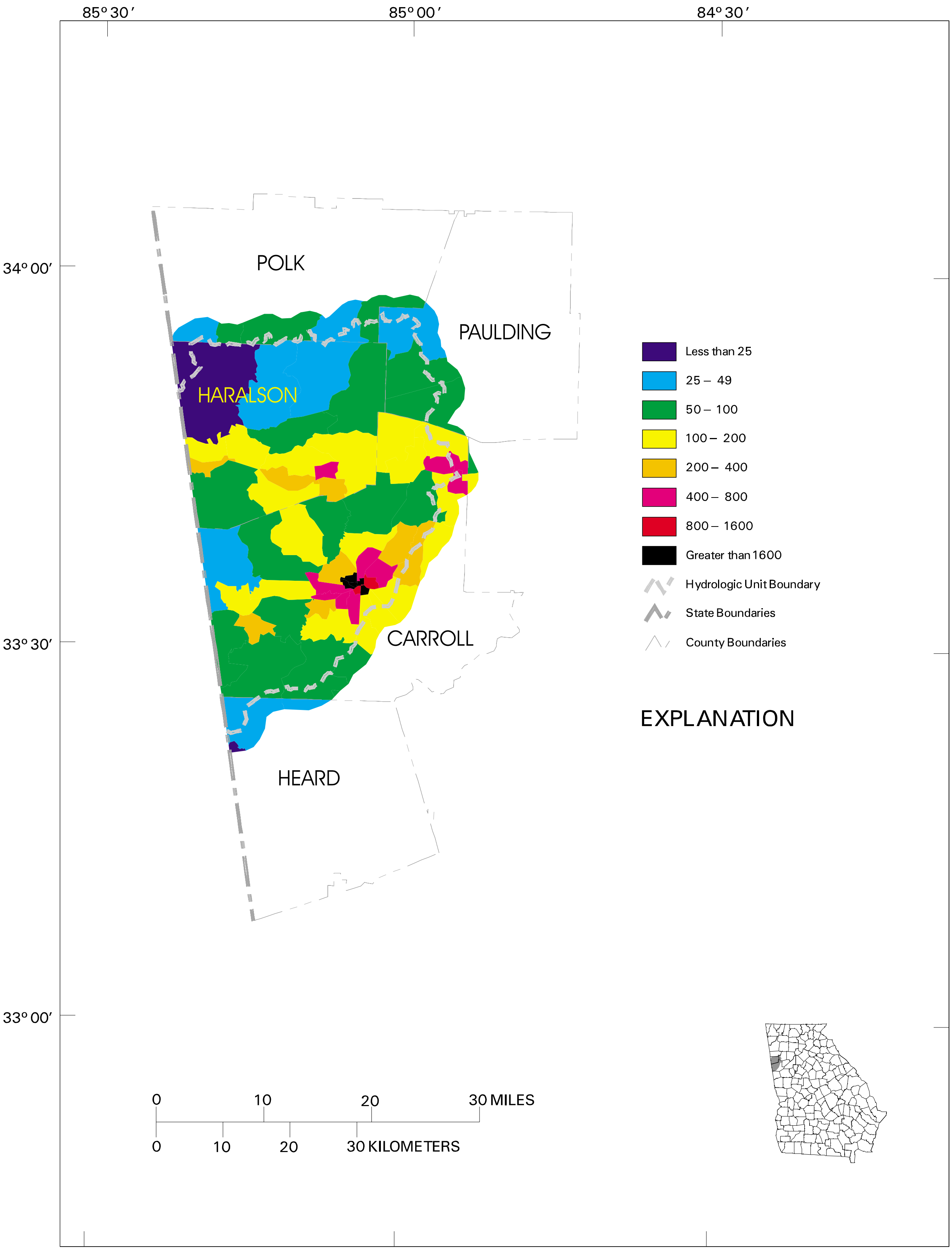

Figure 2-7. Population Density in the Tallapoosa River Basin, 1990

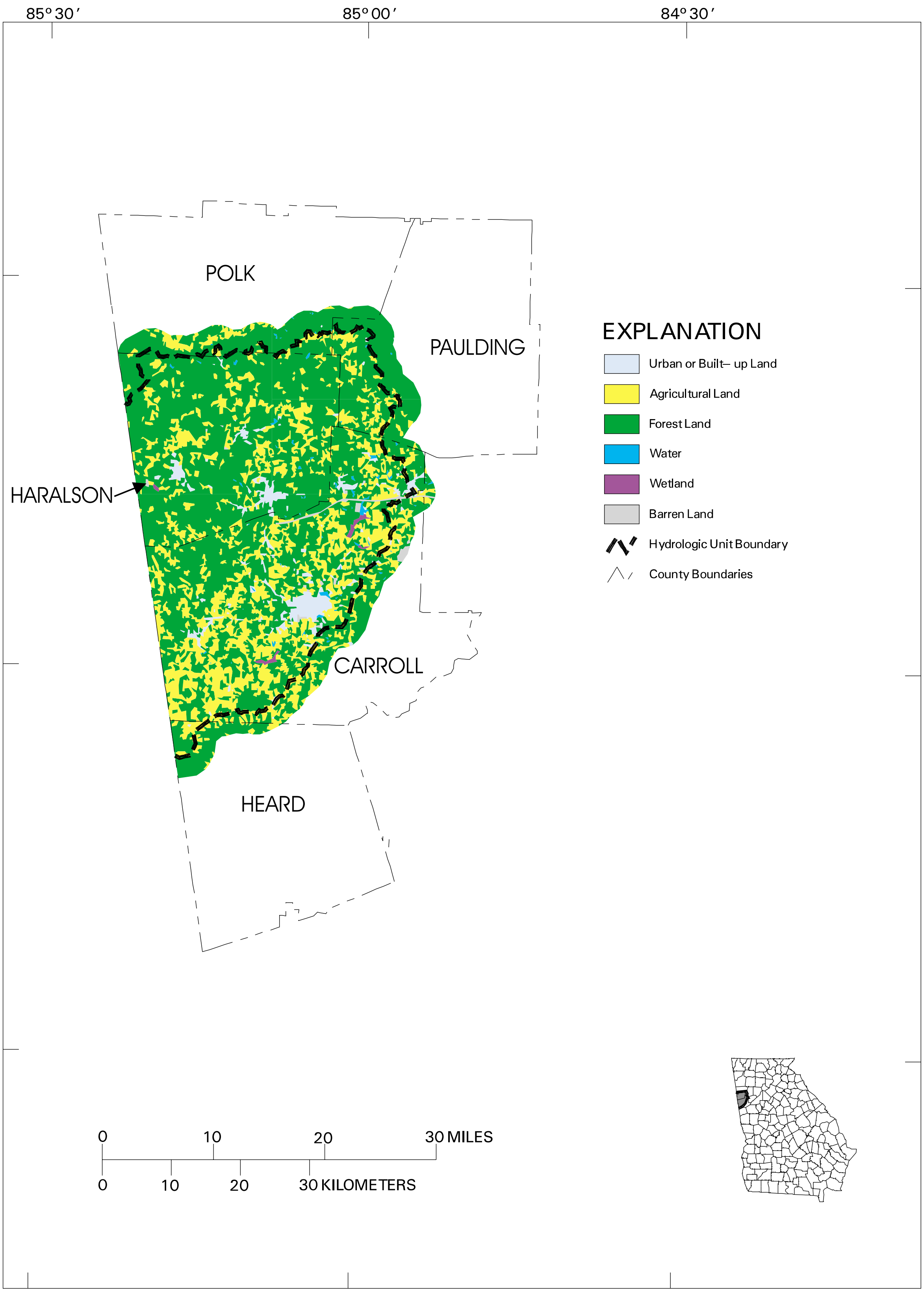

Figure 2-8. Land Use, Tallapoosa River Basin, HUC 03150108, USGS 1972-76 Classification Updated with 1990 Urban Areas

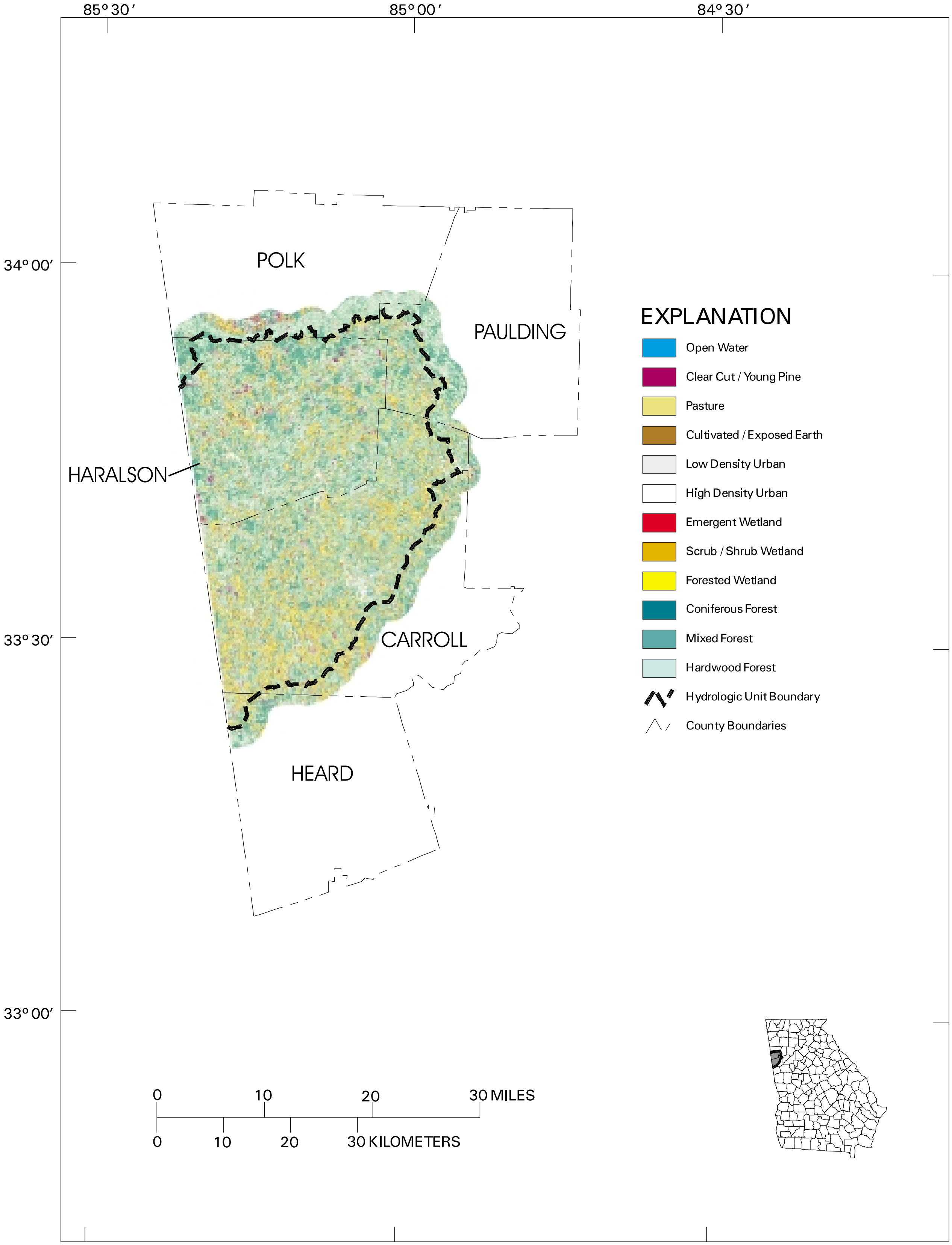

Figure 2-9. Land Cover 1990, Tallapoosa River Basin, HUC 03150108

Table 2-4. Land Cover Statistics for the Tallapoosa River Basin, 1988–1990

Class Name	%	Acres
Open Water	0.9	3,676.8
Clear Cut/Young Pine	1.9	8,031.3
Pasture	15.0	62,163.7
Cultivated/Exposed Earth	6.9	28,509.8
Low Density Urban	3.2	13,334.3
High Density Urban	0.9	3,592.3
Emergent Wetland	0.1	336.1
Scrub/Shrub Wetland	0.1	281.9
Forested Wetland	1.0	4,143.3
Coniferous Forest	16.4	68,202.3
Mixed Forest	30.6	126,777.4
Hardwood Forest	22.8	94,719.4
Salt Marsh	0.0	0.0
Brackish Marsh	0.0	0.0
Tidal Flats/Beaches	0.0	0.0
Total	*100.0*	*414,892.4*

Forestry

Forestry is a major part of the economy within the basin. Markets for forest products afford landowners excellent investment opportunities to manage and sell their timber, pine straw, naval stores, and other products. Statewide, the forest industry output for 1997 was approximately $19.5 billion. The value added by this production, which includes wages, profits, interest, rent, depreciation, and taxes paid into the economy reached a record high $9.3 billion. Georgians benefit directly from 177,000 job opportunities created by the manufacture of paper, lumber, furniture, and various other wood products; consumers of these products also benefit. Other benefits from the forest include hunting, fishing, aesthetics, wildlife watching, hiking, camping, and other recreational opportunities, as well as important environmental benefits such as clean air and water and wildlife habitat.

According to the 1989 U.S. Forest Service's Forest Statistics for Georgia (Thompson, 1989), commercial forest lands represent about 70 percent of the total land area in the Tallapoosa River basin (Table 2-5). Private landowners account for 83 percent of the ownership, while the forest industry companies account for 16 percent. Governmental

Table 2-5. Forestry Acreage in the Tallapoosa River Basin

County	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Carroll	114,700	24,200	10,900	69,400	10,200
Haralson	128,400	46,800	30,000	37,300	14,200
Heard *					
Paulding	13,400	6,700	0	6,700	0
Polk	3,700	3,700	0	0	0
Total	260,200	81,400	40,900	113,300	24,500

** No sample points occurred within the small section of Heard County, therefore no analysis was available.*

entities account for less than 1 percent of the forest land. Commercial silvicultural land use is concentrated in the Piedmont, west of Atlanta, primarily in Carroll and Haralson counties. (Table 2-5 and Figure 2-10).

The pine type is composed of 38,600 acres of plantations and 42,800 acres of natural stands.

For the period from 1982 through 1989, there was a statewide trend of loss of forest acreage resulting from both conversion to urban and related uses and clearing for agricultural uses. No trends could be established within the basin solely using the 1982 and 1989 USFS data. However using entire Carroll and Haralson County figures as a representative example, the area classified as commercial forest land decreased 1 percent. The area classified as pine type increased (1 percent). The area classified as oak-pine type increased 3 percent. Upland hardwood acreage decreased 9 percent. Lowland hardwood acres increased 35 percent.

Agriculture

Agriculture in the Tallapoosa River basin is primarily restricted to poultry and livestock operations surrounded by pastures. Total farmland in the Tallapoosa River basin (Figure 2-11) has decreased every agricultural census year from 1974 to 1987 (U.S. Bureau of the Census, 1981 a,b,c; 1981a,b,c). By 1992, the total amount of land in farms in the basin had fallen to 88,060 acres, most of which is in pasture.

Those lands that are in farms; however, support a vibrant infrastructure in the cattle and broiler industry. In fact, Carroll County is the third highest ranking cattle producing county in Georgia with 27,000 head of cattle on farms in 1997 (Georgia Agricultural Facts, 1997 Edition). Carroll County also ranks ninth among Georgia counties in commercial broiler production having sold over 25,000,000 birds in 1992 (Georgia Agricultural Facts, 1997 Edition). There are also a few dairy and swine operations scattered throughout the Basin (Table 2-6).

2.3 Local Governments and Planning Authorities

Many aspects of basin management and water quality protection depend on decisions regarding zoning, land use, and land management practices. These are particularly important for the control of nonpoint pollution—pollution that arises in storm water runoff from agriculture, urban or residential development, and other land uses. The authority and responsibility for planning and control of these factors lies with local governments, making local governments and jurisdictions important partners in basin management.

Table 2-6. Agricultural Operations in the Tallapoosa River Basin, 1992-1995 (data supplied by NRCS)

Element	Total for Basin
Dairy Cows	720
Beef Cows	25,900
Hogs	2,140
Layer Hens (thousands)	0
Broilers (thousands)	31,480
Harvested Cropland (acres)	11,930
Total Land in Farms (acres)	*88,060*

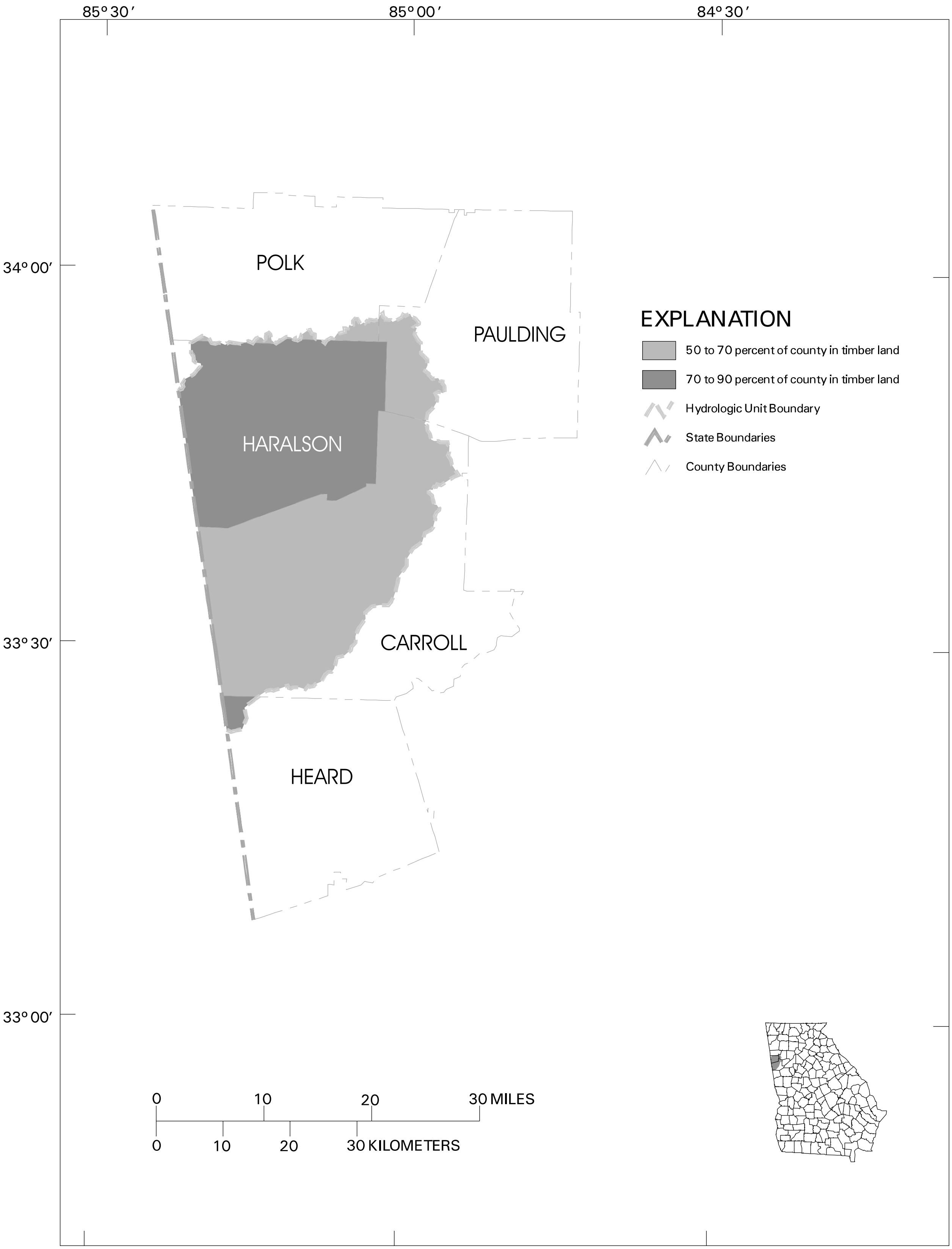

Figure 2-10. Silvicultural Land in the Tallapoosa River Basin

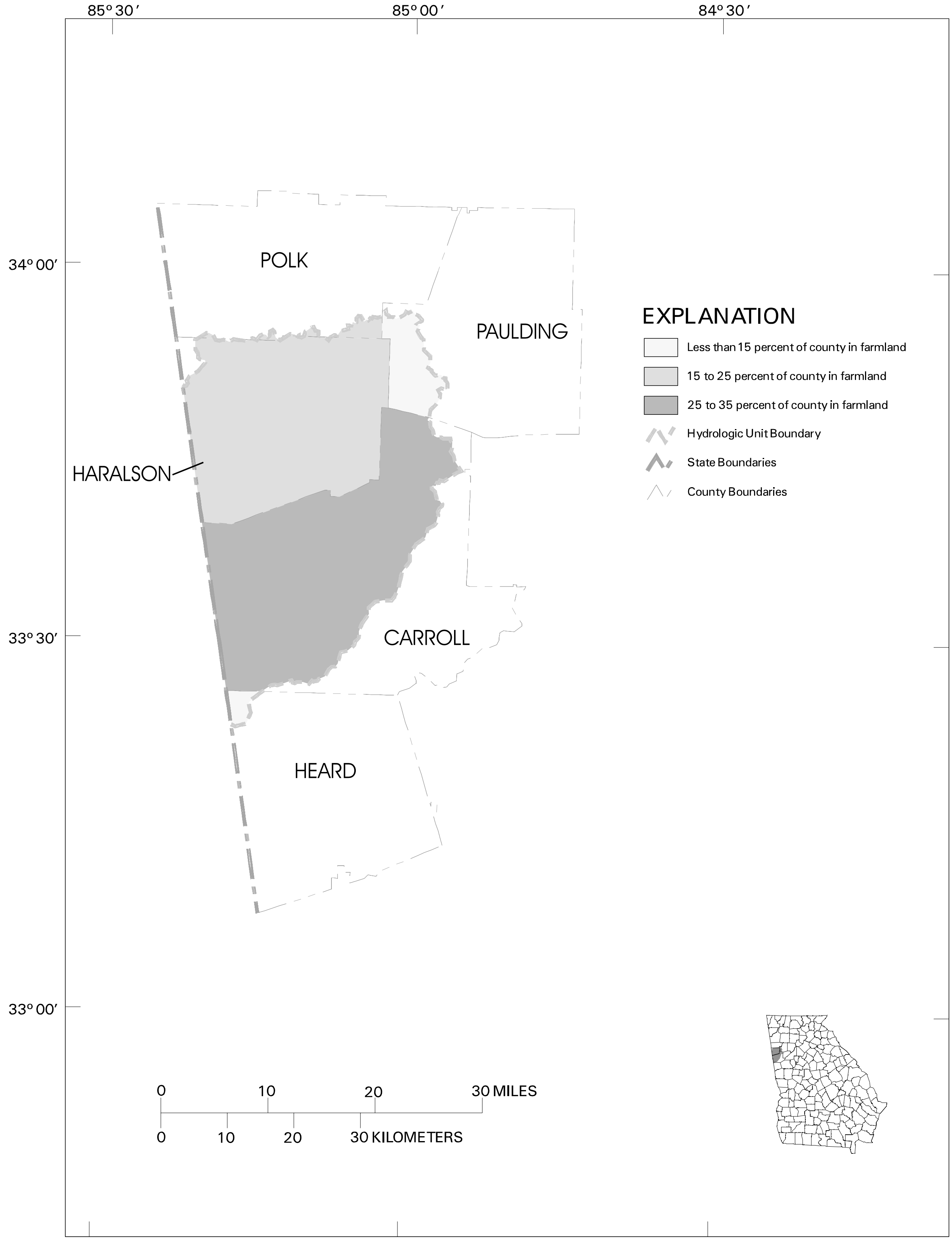

Figure 2-11 . Agricultural Land in the Tallapoosa River Basin

The Department of Community Affairs (DCA) is the state's principal department with responsibilities for implementing the coordinated planning process established by the Georgia Planning Act. Its responsibilities include promulgation of minimum standards for preparation and implementation of plans by local governments, review of local and regional plans, certification of qualified local governments, development of a state plan, and provision of technical assistance to local governments. Activities under the Planning Act are coordinated with the Environmental Protection Division (EPD), Regional Development Centers, and local governments.

2.3.1 Counties and Municipalities

Local governments in Georgia consist of counties and incorporated municipalities. As entities with constitutional responsibility for land management, local governments have a significant role in the management and protection of water quality. The role of local governments includes enacting and enforcing zoning, storm water, and development ordinances; undertaking water supply and wastewater treatment planning; and participating in programs to protect wellheads and significant ground water recharge areas. Many local governments are also responsible for operation of water supply and wastewater treatment facilities.

The Tallapoosa basin includes portions of five Georgia counties (Table 2-7 and Figure 2-2); however, only three counties have a significant fraction of their land area within the basin. Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-8 lists the municipalities in the basin.

2.3.2 Regional Development Centers

Regional Development Centers (RDCs) are agencies of local governments, with memberships consisting of all the cities and counties within each RDC's territorial area. There are currently 17 RDCs in Georgia. RDCs facilitate coordinated and comprehensive planning at local and regional levels, assist their member governments with conformity to minimum standards and procedures, and can have a key role in promoting and supporting management of urban runoff, including watershed management initiatives. RDCs also serve as liaisons with state and federal agencies for local governments in each region. Funding sources include members' dues and funds available through DCA. Table 2-9 summarizes the RDCs and the associated counties within the Tallapoosa basin.

Table 2-7. Georgia Counties in the Tallapoosa River Basin

Counties Entirely within the Tallapoosa Basin	Counties Partially within the Tallapoosa Basin	Counties with Insignificant Area within the Basin
(none)	Carroll, Haralson, Paulding	Heard, Polk

Table 2-8. Georgia Municipalities in the Tallapoosa River Basin

Bowdon	Draketown	Mt. Zion	Victory
Bowdon Junction	Felton	Tallapoosa	Villa Rica
Bremen	Jake	Temple	Waco
Buchanan	Jonesville	Tyus	Yorkville
Carrollton	Kansas	Veal	

Table 2-9. Regional Development Centers in the Tallapoosa River Basin

Regional Development Center	Member Counties with Land Area in the Tallapoosa Basin
Chattahoochee-Flint RDC	Carroll, Heard
Coosa Valley RDC	Haralson, Paulding, Polk

2.4 Water Use Classifications

2.4.1 Georgia's Water Use Classification System

The Board of Natural Resources was authorized through the Rules and Regulations for Water Quality Control promulgated under the Georgia Water Quality Control Act of 1964, as amended, to establish water use classifications and water quality standards for the surfacewaters of the state. The water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. Georgia was the second state in the nation to have its water use classifications and standards for intrastate waters approved by the federal government in 1967. For each water use classification, water quality standards or criteria were developed that established a framework to be used by the Water Quality Control Board and later EPD in making water use regulatory decisions.

In 1972 the EPD applied the water use classification system to interstate waters. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-10 provides a summary of water use classifications and criteria for each use.

Congress made changes in the Clean Water Act in 1987 that required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, the Board of Natural Resources adopted 31

Table 2-10. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[2]		pH	Temperature (other than trout streams)[2]	
Use Classification[1]	30-Day Geometric Mean[3] (no/100 ml)	Maximum (no./100mL)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise above Ambient (°F)	Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing[4]	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

1 Improvements in water quality since the water use classifications and standards had originally been adopted in 1972 provided the opportunity for Georgia to upgrade all stream classifications and eliminate separate use designations for "Agriculture," "Industrial," "Navigation," and "Urban Stream" in 1993.

2 Standards for Trout Streams, for dissolved oxygen are an average of 6.0 mg/L and a minimum of 5.0 mg/Ll. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2°F is allowed in Secondary Trout Streams.

3 Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: The geometric mean of 2 and 18 is the square root of 36.

4 Standards are same as those for fishing with the exception of dissolved oxygen, which has site-specific standards.

numeric standards for protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a summary of toxic substance standards that apply to all waters in Georgia. Water quality standards are discussed in more detail in Section 5.2.1.

In the late 1960s through the mid-1970s there were many water quality problems in Georgia. Many stream segments were classified for the uses of navigation, industrial, or urban stream. Major improvements in wastewater treatment over the years have allowed the stream segments to be reclassified to the uses of fishing or coastal fishing, which include more stringent water quality standards. The final two segments in Georgia were upgraded as a part of the triennial review of standards completed in 1989. All of Georgia's waters are currently classified as fishing, recreation, drinking water, wild river, scenic river, or coastal fishing.

2.4.2 Water Use Classifications for the Tallapoosa River Basin

Waters in the Tallapoosa River basin are classified as fishing, recreation, or drinking water. Most of the waters are classified as fishing. Those waters explicitly classified in Georgia Regulations are shown in Table 2-11; all other waters in the basin are classified as fishing. A number of waters in the northern portion of the Tallapoosa River basin are also designated as secondary trout streams, as shown in Table 2-12. Secondary trout streams are waters which contain no naturally reproducing trout populations but are capable of sustaining stocked trout throughout the year.

Table 2-11. Tallapoosa River Basin Waters Classified in Georgia Regulations[1]

Waterbody	Description of Segment	Use Classification
Tallapoosa River	Headwaters to Georgia Hwy. 100	Drinking Water
Little Tallapoosa River	Headwaters to SCS Dam No. 36 (Carrollton River Raw Water Intake)	Drinking Water

[1] *Rules and Regulations for Water Quality Control, Chapter 391-3-6 (13). Waters within the Tallapoosa River basin not listed above are classified as Fishing.*

Table 2-12. Tallapoosa River Basin Waters Designated as Trout Streams

County	Classification	Description of Segment
Carroll	Secondary	Brooks Creek watershed
	Secondary	Mud Creek watershed
	Secondary	Tallapoosa River
Haralson	Secondary	Beach Creek watershed upstream from Haralson County Road 34
	Secondary	Flatwood Creek watershed
	Secondary	Lassetter Creek watershed
	Secondary	Mann Creek watershed upstream from Haralson County Road 162
	Secondary	Tallapoosa River watershed upstream from Haralson County Road 222
	Secondary	Mountain Creek watershed
	Secondary	Tallapoosa Creek watershed

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In This Section

- Drinking Water Supply
- Surface Water Quantity
- Ground Water Quantity

Section 3

Water Quantity

This section addresses water quantity issues (availability and use) in the Georgia portion of the Tallapoosa basin, whereas water quality is discussed in Section 4. Water use in the basin is measured by estimates of freshwater withdrawn from ground and surface water sources. Water availability is assessed based on annual surface water flows and ground water storage. Saline water is not used in the basin. Uses of water include both consumptive uses (in which the water is no longer available to the basin) and nonconsumptive uses (in which the water is returned to the basin after use). Over 91 percent of total Municipal and Industrial (M&I) water withdrawals in 1990 was not returned to surface or ground water sources, primarily due to evaporative losses and returns to the Chattahoochee River basin.

Surface water is the primary water source in most of the Tallapoosa River basin because surface water supplies are plentiful and ground water yields from crystalline rock aquifers tend to be low. Water use in the Tallapoosa basin is increasing, but at a relatively slow rate. The total water demands are projected to increase from 19.3 MGD in 1995 to 25.3 MGD by 2020.

In the following sections, water availability is discussed from a number of viewpoints. First, the important topic of drinking water is presented, which includes both surface and ground water supplies. Then, general surface water availability is presented, followed by ground water availability.

3.1 Drinking Water Supply

3.1.1 Drinking Water Supplies in the Tallapoosa River Basin

The headwaters area of the Tallapoosa River basin serve a majority of the population of Haralson and Carroll Counties including the cities of Carrollton, Bremen and Villa Rica. Most surface water intakes are located on the Tallapoosa River, Little Tallapoosa River or smaller tributaries of the rivers. Often larger public water systems that treat surface water sell water to neighboring cities and counties. All cities and counties in the Tallapoosa River basin use surface water for drinking water. Smaller subdivisions and mobile home parks use ground water since they are located too far from a public water system that sells surface water.

The Tallapoosa River basin provides drinking water for about 74,034 people in the state of Georgia through municipal or privately owned public water systems. A public water system pipes water for human consumption and has at least 15 service connections or regularly serves at least 25 individuals 60 or more days out of the year. Public water systems sources include surface water pumped from rivers and creeks or ground water pumped to the surface from wells or naturally flowing from springs. There are three different types of public water systems: community, non-community non-transient, and non-community transient.

Types of Public Water Systems

A community public water system serves at least 15 service connections used by year round residents or regularly serves at least 25 year-round residents. Examples of community water systems are municipalities, such as cities, counties, and authorities, which serve residential homes and businesses located in the areas. Other types of community public water systems include rural subdivisions or mobile home parks which have a large number of homes connected to a private public water system, usually a small number of wells. A non-community non-transient public water system serves at least 25 of the same persons over 6 months per year. Examples of non-community non-transient systems are schools, office buildings, and factories that are served by a well or privately owned surface water plant.

A non-community transient public water system does not meet the definition of a non-community non-transient. A non-community transient public water system provides piped water for human consumption to at least 15 service connections or which regularly serves at least 25 persons at least 60 days a year. Examples of non-community transient systems are highway rest stops, restaurants, motels, and golf courses.

Private domestic wells serving individual houses are not covered by the states public water system regulations. However, the regulations for drilling domestic wells are set by the Water Well Standards Act and the local health department is responsible for ensuring water quality.

In the Tallapoosa River basin there are approximately 11 community public water systems using surface water and serving 73,367 people and 5 community public water systems using ground water and serving 461 people (Table 3-1). The locations of surface water intakes within the Tallapoosa River basin are shown in Figure 3-1.

3.1.2 Drinking Water Demands

Drinking water demands are expected to increase slowly due to low rates of projected population growth in the Tallapoosa Basin. Projections of drinking water demands are discussed in Section 3.2 and 3.3.

3.1.3 Drinking Water Permitting

The Georgia Safe Drinking Water Act of 1977 and the Rules for Safe Drinking Water (391-3-5) adopted under the act require any person who owns and/or operates a public water system to obtain a permit to operate a public water system from the Environmental Protection Division. The permitting process has three phases—Inquiry and Discovery, Technical Review, and Permitting. During these phases the owner must provide detailed description of the project; demonstrate the reliability of the water source; render engineering plans and specifications prepared by a professional engineer demonstrating

Table 3-1. Community Public Water Systems in the Tallapoosa River Basin

Public Water System Name	Water System ID	County	Source
Systems Directly Supplied by Surface Water			
HUC 03150108			
Haralson Co. Water System	1430007	Haralson	Little Tallapoosa River
City of Villa Rica	0450006	Carroll	1. Lake Paradise 2. Cowens Lake
City of Bremen	1430000	Haralson	Beech Creek Tributary
City of Temple	0450005	Carroll	Webster Creek
City of Carrollton	0450002	Carroll	Little Tallapoosa River
City of Bowdon	0450000	Carroll	1. Tisinger Reservoir 2. Turkey Creek
Systems Supplied by Other Sources (arranged by county)			
Carroll County	0450001	Carroll	Purchased Surface Water
Mount Zion	0450003	Carroll	Purchased Surface Water
Memory Springs Mobile Home Pk	0450016	Carroll	Groundwater
Rolling View Homeowners Assoc.	0450017	Carroll	Groundwater
Sunset Village MHP	0450019	Carroll	Groundwater
Del Villa MHP	0450081	Carroll	Groundwater
Timberlake Estates	0450083	Carroll	Groundwater
Buchanan	1430001	Haralson	Purchased Surface Water
Tallapoosa	1430002	Haralson	Purchased Surface Water
Waco	1430010	Haralson	Purchased Surface Water

the construction integrity of wells, treatment, and distribution systems; conduct preliminary water sample testing; and submit legal documentation including an application to operate a public water system. Permits contain specific conditions the owner must meet for different types of public water systems, including a list of approved water sources, filter rates, disinfection and treatment requirements, operator certification, documentation and reporting requirements, compliance with water sample testing schedule, and number of allowed service connections. Permits are issued for 10 years and are renewable. As of this writing, there are 19 active and permitted systems in the Tallapoosa River basin.

3.2 Surface Water Quantity

3.2.1 Surface Water Supply Sources

Surface water supplies in the Tallapoosa basin include water in rivers, ponds, and small reservoirs. Total mean annual flow in the Tallapoosa basin at the Alabama state line is approximately 960 MGD. There are no major impoundments on the Tallapoosa within Georgia, although there are plans to build the West Georgia Regional Reservoir in Haralson County.

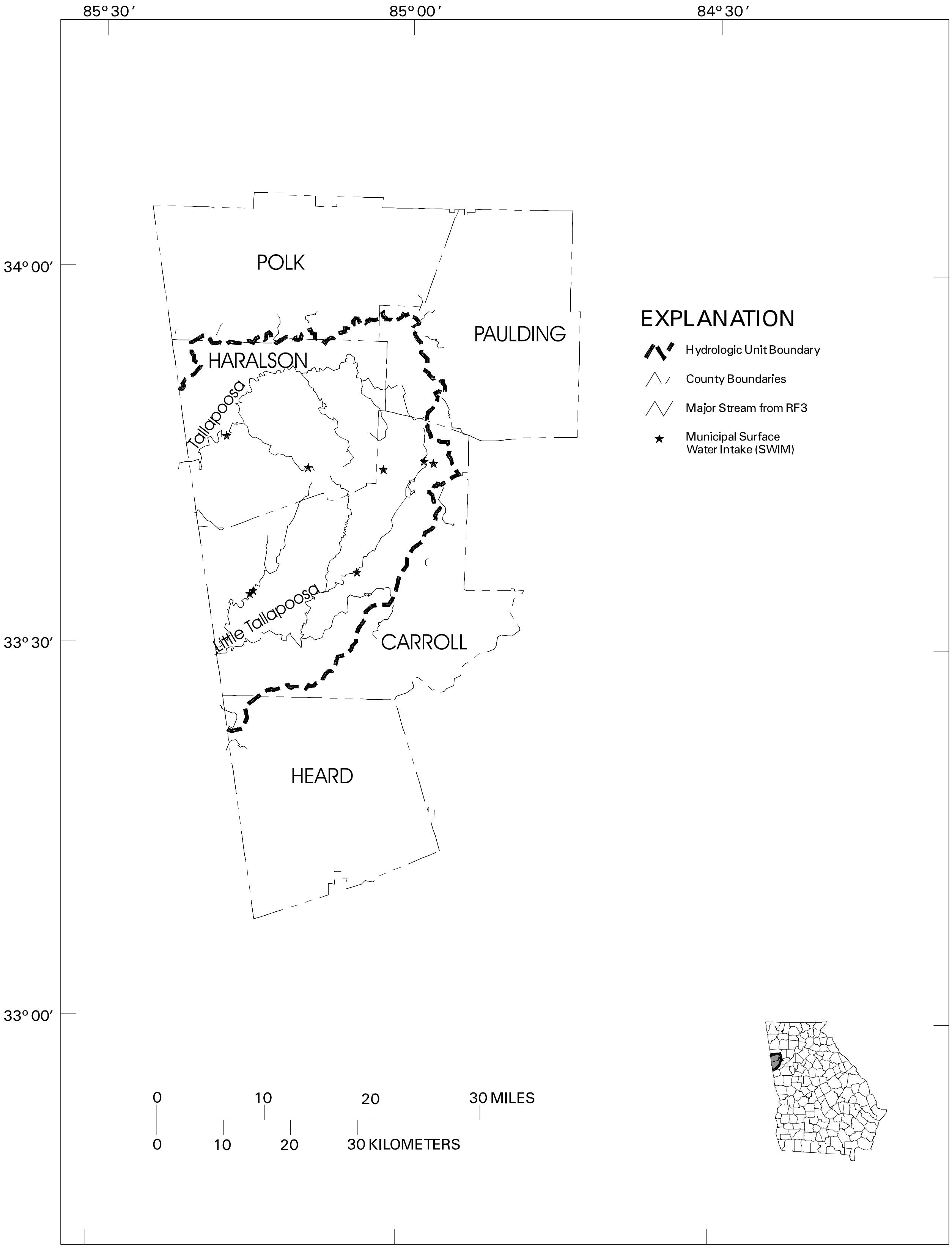


Figure 3-1. Surface Water Intakes, Tallapoosa River Basin

3.2.2 Surface Water Supply Demands and Uses

Municipal and Industrial Demand

Municipal and Industrial (M&I) water demands include public supplied and private supplied residential, commercial, governmental, institutional, industrial, manufacturing, and other demands such as distribution system water losses. Total M&I water demand in the Georgia part of the Tallapoosa basin is expected to increase from 16.7 million gallons per day (MGD) in 1995 to 25.3 MGD in 2020 with passive conservation programs in place. These passive conservation measures include increases in water use efficiency resulting from recently implemented plumbing codes, the natural replacement of water fixtures, and known increases in water and wastewater prices since 1990.

Existing M&I permits for municipal and industrial (nonagricultural) surface water withdrawals in the Tallapoosa River basin are shown in Table 3-2. In 1990, the residential sector of the basin used about 46 percent of the M&I water, compared to 31 percent for the manufacturing sector. By 2050, the residential demand is expected to increase to 50 percent of demand in the Tallapoosa basin, while the demand for water by the manufacturing sector is projected to decline to 24 percent of the 2050 basin total demand.

All of the Tallapoosa basin M&I water withdrawal in 2005 is projected to be supplied by surface water withdrawals.

Much of the M&I demand is consumed or returned to the Chattahoochee River basin. Currently, less than 10 percent of the M&I withdrawal is returned to the Tallapoosa River. In 2005 approximately 9 percent of the total water withdrawn is projected to be returned to the river.

Agricultural Water Demand

Agricultural water demand in the basin are relatively small, and only a limited fraction of agricultural lands are irrigated. In 1992 approximately 17,800 acres in the Georgia portion of the Tallapoosa River basin were devoted to the production of crops, orchards, turf, nursery, and aquaculture. Only 580 of these acres were irrigated. The number of irrigated acres in the Tallapoosa basin is expected to increase to 850 acres by the year 2050.

Table 3-2. Permits for Surface Water Withdrawals from the Tallapoosa River Basin

Facility Name	Source	24 Hour Maximum (MGD)	Monthly Average (MGD)	County
Bowdon, City of - Indian	Indian Creek	0.40	0.36	Carroll
Bowdon, City of - Lake Tysinger	Lake Tysinger	1.00	1.00	Carroll
Bremen, City of	Beach Creek	0.80	0.58	Haralson
Carrollton, City of	Lt. Tallapoosa River	12.00	12.00	Carroll
Haralson County Water Authority	Tallapoosa River	3.75	3.75	Haralson
Southwire Company	Buffalo Creek	2.00	1.00	Carroll
Temple, City of	Webster Creek	0.25	0.17	Carroll
Villa Rica, City of	Lake Paradise & Cowens Lake	1.50	1.50	Carroll

Note: Permits are not required for withdrawals of less than 100,000 gallons per day on a monthly average.

When averaged over a year, the 1992 agricultural water demand for counties in the Georgia part of the Tallapoosa basin was 2.5 MGD (Table 3-3). The agricultural water demand in the basin is expected to increase to 3.2 MGD in 2050.

In the Tallapoosa River basin most agricultural water is used for livestock and poultry operations, and is supplied from surface water. Unlike municipal, industrial, and cooling water withdrawals, practically none of the water withdrawn for agricultural use is returned to streams.

Table 3-3. Agricultural Water Demand for the Tallapoosa River Basin (Georgia Portion)

Year	Total Water Demand (MGD)
1995	2.6
2000	2.6
2010	2.8
2020	2.9
2050	3.2

Note: Demand in MGD, including crops/orchards, turf, nursery, livestock/poultry, and aquaculture demand, from NRCS, 1996, based on Medium Demand projections without water conservation.

Power Generation Water Demand

There are no hydroelectric or thermoelectric power generating systems located in the Georgia portion of the Tallapoosa River Basin.

Navigational Water Demand

The Georgia portion of the Tallapoosa River basin is not used for commercial navigation.

Recreation

Recreational use of the Tallapoosa River Basin includes local fishing activities on the rivers and farm ponds. John Tanner State Park in western Carroll County provides camping, boating, fishing, and picnicking opportunities.

Fish and Wildlife Water Demand

No fish and wildlife management facilities are located in the Georgia portion of the Tallapoosa Basin.

Waste Assimilation Water Demand

Water quantity, wastewater treatment, and wastewater discharge permitting are addressed in Section 4. However, it should be noted that the guidelines for discharge of treated effluent into the rivers and streams of the Tallapoosa River Basin assume that sufficient surface water flow will be available to assimilate waste and ensure that water quality criteria will be met.

Environmental Water Demand

EPD recognizes the importance of maintaining suitable aquatic habitat in Georgia's lakes and streams for support viable communities of fish and other aquatic organisms. Small portions of the mainstem of the Tallapoosa River and Little Tallapoosa River have been altered drastically by human actives. From a water quantity perspective, aquatic habitat is adversely affected in some locations by unnatural extreme variations in lake levels and river flow. One significant issue which is receiving increasing attention from EPD is that of the minimum stream flow rate which must be maintained below a reservoir. A current state requirement is to maintain the 7Q10 flow (7-day average low flow with a once in ten years recurrence interval), when water is available upstream. Consideration is being given to an increase in this minimum flow requirement under recommendations of the Wildlife Resources Division (Evans and England, 1995).

3.2.3 Surface Water Withdrawal Permitting

The 1977 Surface Water Amendments to the Georgia Water Quality Control Act of 1964 require all nonagricultural users of more than 100,000 GPD on a monthly average (from any Georgia surface water body) to obtain a permit from EPD for this withdrawal. These users include municipalities, industries, military installations, and all other nonagricultural users. The statute stipulates that all pre-1977 users who could establish the quantity of their use prior to 1977 would be "grandfathered" for that amount of withdrawal. Table 3-2 lists the permits in effect in the Tallapoosa River Basin.

Applicants are required to submit details relating to the source of withdrawals, demand projections, water conservation measures, low flow protection measures (for nongrandfathered withdrawals), and raw water storage capacities. An EPD-issued permit identifies the source of withdrawal, the monthly average and maximum 24-hour withdrawal, the standard and special conditions under which the permit is valid, and the expiration date of the permit. The standard conditions section of the permit generally defines the reporting requirements (usually annual submission of monthly average withdrawals); the special conditions section of the permit usually specifies measures the permittee is required to undertake so as to protect downstream users and instream uses (e.g. waste assimilation, aquatic habitat). The objective of these permits is to manage and allocate water resources in a manner that both efficiently and equitably meets the needs of all the users.

Farm Irrigation Permits

The 1988 Amendments to the Water Quality Control Act establish the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned surface water permitting statute, the lower threshold is 100,000 GPD; however, users of less water may apply for and be granted a permit. With two exceptions, farm use is defined as irrigation of any land used for general farming, aquaculture, pasture, turf production, orchards, nurseries, watering for farm animals and poultry, and related farm activities. One relevant exception is that the processing of perishable agricultural products is not considered a farm use.

Applicants for these permits who could establish that their use existed prior to July 1, 1988, and when these applications were received prior to July 1, 1991, were "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Generally, agricultural users are not required to submit any water use reports.

3.2.4 Flooding and Floodplain Management

Sometimes the issue is not the lack of water, but too much water. Floods, as well as droughts, can be very damaging natural hazards. Almost all of Georgia is susceptible to the threat of floods. The Georgia Emergency Management Agency (GEMA) ranks floods as the number one natural hazard in Georgia. Over the past nineteen years, 57 Georgians have lost their lives due to flooding. The Flood of 1994 (Tropical Storm Alberto) is considered the worst flooding event in Georgia since 1841, which is the beginning of the State's recorded flood history. Much of the flooding in 1994 resulted from the overflowing of the Flint River and the Ocmulgee River and, to a much lesser extent, the Tallapoosa River.

Development within the floodplains of these rivers is also a concern, especially when a community has no means of regulating the development. Development within floodplain areas can increase flood levels, thereby increasing the number of people and the amount of property at risk. Although the term "floodplain management" is often used as a synonym for program or agency-specific projects and regulations, it is in fact quite a broad concept. It is a continuous process of making decisions about whether floodplains are to be used for development and how they are to be developed. It encompasses the choices made by owners of floodplain homes and businesses, developers, and officials at all levels of government.

3.3 Ground Water Quantity

3.3.1 Ground Water Sources

As part of the Alabama-Coosa-Tallapoosa and Apalachicola-Tallapoosa-Flint (ACT/ACF) Comprehensive Basin Study, scientists at USGS completed studies of ground water resources in each of eight geographic subareas of the ACT/ACF basins. The Tallapoosa River basin is coincident with Subarea 5 of that study.

Ground water in Subarea 5 is drawn from the fracture-conduit aquifers in crystalline rock, and, to a lesser extent, from porous-media aquifers in the overlying regolith. Journey and Atkins (1996) provide an analysis of the ground-water utilization within the Georgia portion of the Tallapoosa Basin. They estimated that 1990 ground water use was 0.6 percent of mean annual baseflow, 6 percent of average drought baseflow, and 21 percent of minimum drought baseflow, based on observations during the 1954 drought. In general, ground-water resources are underutilized throughout the basin.

3.3.2 Ground Water Supply Demands

Municipal and Industrial Uses

100 percent of the Tallapoosa basin M&I water demand in 2005 is projected to be supplied by surface water withdrawals.

Agricultural Water Demand

Total agricultural water demand for the Tallapoosa River basin is discussed above in Section 3.2.2, and is derived from surface and ground water sources. Most agricultural water in the basin is used for poultry and livestock, and is supplied from surface water.

3.3.3 Ground Water Supply Permitting

The Georgia Ground Water Use Act of 1972 requires permits from EPD for all non-agricultural users of ground water of more than 100,000 GPD. General information required of the applicant includes location (latitude and longitude); past, present, and expected water demand; expected unreasonable adverse effects on other users; the aquifer system from which the water is to be withdrawn; and well construction data. The permits issued by EPD stipulate both the allowable monthly average and annual average withdrawal rates, standard and special conditions under which the permit is valid, and the expiration date of the permit. Ground water use reports are generally required of the applicant on a semi-annual basis. The objective here is the same as with surface water permits. There are no active Georgia municipal and industrial ground water withdrawal permits in the Tallapoosa basin.

Farm Irrigation Permits

The 1988 Amendments to the Ground Water Use Act establishes the permitting authority within EPD to issue farm irrigation water use permits. As with the previously mentioned ground water permitting statute, the lower threshold is 100,000 GPD; however users of less water may apply and be granted a permit. Agricultural withdrawal permits are too numerous to list in this document.

Applicants for these permits who could establish that their use existed prior to July 1, 1988, and when their applications were received prior to July 1, 1991, were "grandfathered" for the operating capacity in place prior to July 1, 1988. Other applications are reviewed and granted with an eye towards protection of grandfathered users and the integrity of the resource. Generally, agricultural users are not required to submit any water use reports.

Excessive Ground Water Withdrawals

Excessive ground water withdrawal can lead to lowering or drawdown of the water table. Localized groundwater drawdowns are generally discovered only after the fact of permitting has occurred and withdrawal operations begun. To avoid such a possibility, if an application for a very large use of groundwater is received, the Water Resources Management Program of the Georgia EPD can take certain steps to possibly contain drawdowns effects. Modeling the hydrogeologic impact of such a large user may be required of the potential permittee. If this computer analysis indicates no unreasonable impact on existing users, such a water use permit may be approved. Another recommended possibility is a negotiated reduction in permit amounts to a more moderate amount of withdrawal, with lessened impacts. Prior to full scale production of a well field, well pumping tests run at or near actual production rates can be required. These may give the permittee and the EPD some real idea of the amount of water that may pumped safely, without endangering other users nor drawing down the aquifer too greatly. Permit withdrawal limits may then be set at some safer yield which is determined by these pumping tests. These tests may also indicate that proposed pumping amounts may require more wells drilled to spread out the ultimate production impact on the aquifer.

References

Evans, J. W. and R. H. England. 1995. A Recommended Method to Protect Instream Flows in Georgia. Georgia Department of Natural Resources, Wildlife Resources Division, Social Circle, Georgia.

Journey, C.A. and J.B. Atkins. 1996. Ground-Water Resources of the Tallapoosa River Basin in Georgia and Alabama—Subarea 5 of the Apalachicola-Chattahoochee-Flint and Alabama-Coosa-Tallapoosa River Basins. Open-File Report 96-433. U.S. Geological Survey, Montgomery, Alabama.

NRCS. 1996. Alabama-Coosa-Tallapoosa, Apalachicola-Chattahoochee-Flint Cooperative Study, [Agricultural] Outlook and Water Demand Projections, Appendix A (Revised March 1996). Natural Resources Conservation Service, U.S. Department of Agriculture.

In This Section

- Sources and Types of Environmental Stressors
- Summary of Stressors Affecting Water Quality

Section 4

Water Quality: Environmental Stressors

Section 4, 5, 6, and 7 of this document are closely linked, providing the foundation for the water quality concerns in the basin, identifying the priority issues based on these concerns, and finally, recommending management strategies to address these concerns. Therefore, the reader will probably wish to refer back and forth between sections to track specific issues.

This section describes the important environmental stressors that impair or threaten water quality in the Tallapoosa River basin. Section 4.1 first discusses the major sources of environmental stressors. Section 4.2 then provides a summary of individual stressor types as they relate to all sources. These include both traditional chemical stressors, such as metals or oxygen demanding waste, and less traditional stressors, such as modification of the flow regime (hydromodification) and alteration of physical habitat.

4.1 Sources and Types of Environmental Stressors

This section describes the major potential sources of environmental stressors within the Coosa River basin. These sources include point source discharges, nonpoint source contributions from land-use activities, and temperature and flow modifications. The sources are discussed by type, which provides a match to regulatory lines of authority for permitting and management.

4.1.1 Point Sources and Nondischarging Waste Disposal Facilities

Point sources are defined as the permitted discharges of treated wastewater to the river and its tributaries, regulated under the National Pollutant Discharge Elimination System (NPDES). These are divided into two main types—permitted wastewater discharges, which tend to be discharged at relatively stable rates, and permitted storm water discharges, which tend to be discharged at highly irregular, intermittent rates, depending on precipitation. Nondischarging waste disposal facilities, including land application systems and landfills, which do not discharge wastewater effluent to surface waters, are also discussed in this section.

NPDES Permitted Wastewater Discharges

The EPD NPDES permit program regulates treated municipal and industrial wastewater discharges, monitors compliance with limitations, and takes appropriate enforcement action for violations. For point source discharges, the permit establishes specific effluent limitations and specifies compliance schedules that must be met by the discharger. Effluent limitations are designed to achieve water quality standards in the receiving water and are reevaluated periodically (at least every 5 years).

Table 4-1 displays the municipal wastewater treatment plants with permitted discharges in the Tallapoosa River basin. The geographic distribution of dischargers is shown in Figure 4-1. Only one of these dischargers, the Tallapoosa WPCP, constitutes a major discharger with at least 1 million gallons per day (MGD) permitted flow. The minor dischargers (<1.0 MGD) have the potential to cause localized stream impacts, but they are relatively insignificant from a basin perspective.

Municipal Wastewater Discharges

Municipal wastewater treatment plants are among the most significant point sources regulated under the NPDES program in the Tallapoosa River basin, accounting for the majority of the total point source effluent flow. These plants collect, treat, and release treated wastewater. Pollutants associated with treated wastewater include pathogens, nutrients, oxygen-demanding waste, metals, and chlorine residuals. Over the past several decades, Georgia has invested more than $15 million in construction and upgrade of municipal water pollution control plants in the Tallapoosa River basin. A summary of these investments is provided in Appendix C. These upgrades have resulted in significant reductions in pollutant loading and consequent improvements in water quality below wastewater treatment plant outfalls. As of the 1996-1997 water quality assessment, only one segment (1 mile) of river/streams was identified in which municipal discharges contributed to not fully supporting designated uses in the Tallapoosa Basin.

Most urban wastewater treatment plants also receive industrial process and nonprocess wastewater, which can contain a variety of conventional and toxic pollutants. Control of industrial pollutants in municipal wastewater is addressed through pretreatment programs. The City of Carrollton wastewater treatment plant has developed and implemented approved local industrial pretreatment program. Through this program, the wastewater treatment plant has established effluent limitations for significant industrial dischargers (those which discharge in excess of 25,000 gallons per day of process wastewater or are regulated by a Federal Categorical Standard) and monitors the industrial user's compliance with those limits. The treatment plant is able to control the discharge of organics and metals into the sewerage system through the controls placed on industrial users.

Industrial Wastewater Discharges

Industrial and federal wastewater discharges are also significant point sources regulated under the NPDES program. There are a total of 11 permitted municipal, state, federal, private, and industrial wastewater and process water discharges in the Tallapoosa River basin, as summarized in Table 4-2. The complete permit list is summarized in Appendix D.

The flow rates for industrial discharges in the Tallapoosa basin are relatively low. However, because the nature of industrial discharges varies widely compared to discharges from municipal plants, effluent flow is not usually a good measure of the significance of an industrial discharge. Industrial discharges can consist of organic, heavy oxygen-demanding waste loads from facilities such as pulp and paper mills; large

Table 4-I. Municipal Wastewater Treatment Plants in the Tallapoosa River Basin

NPDES Permit #	Facility Name	Authority	County	Receiving Stream	Permitted Monthly Average Flow (MGD)
HUC 03150108					
GA0020982	Tallapoosa WPCP	Tallapoosa	Haralson	Green Creek	1.000
GA0021008	Bremen, Baxter Creek	Bremen	Haralson	Baxter Creek	0.200
GA0037435	Bremen, Buck Creek	Bremen	Haralson	Buck Creek	0.900
GA0021512	Buchanan WPCP	Buchanan	Haralson	Cochran Creek	0.170
GA0035921	DIT #144, Haralson Co.		Haralson	Williams Creek	0.009
GA0023493	Bowdon WPCP	Bowdon	Carroll	Indian Creek	0.400
GA0027162	Villa Rica, Tallapoosa	Villa Rica	Carroll	Little Tallapoosa River	0.260

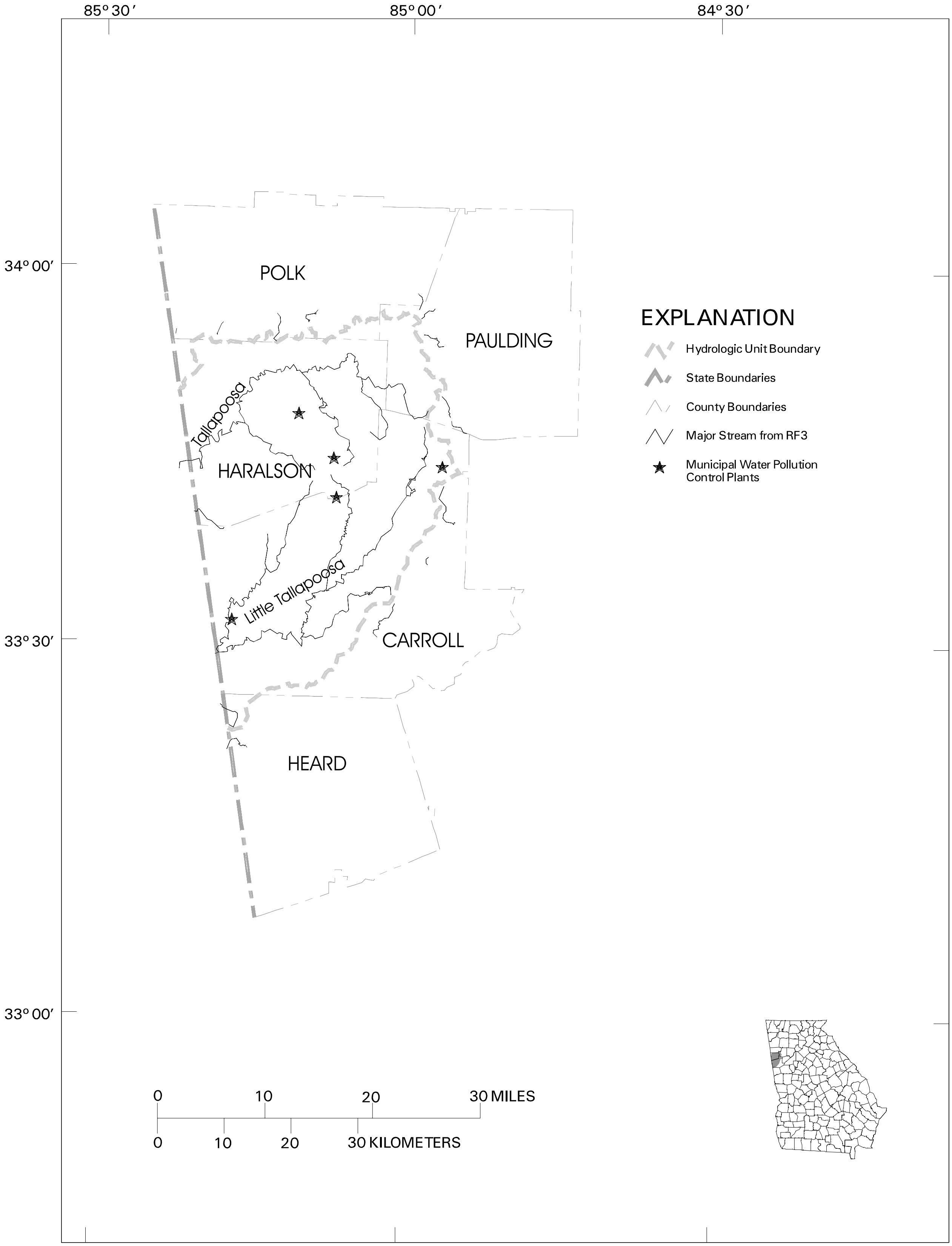


Figure 4-I. Location of Municipal Wastewater-Treatment Plants in the Tallapoosa River Basin

Table 4-2. Summary of NPDES Permits in the Tallapoosa River Basin

HUC	Major Municipal Facilities	Major Industrial and Federal Facilities	Minor Public Facilities	Minor Private and Industrial Facilities	*Total*
03150108	1	0	6	4	*11*

quantities of noncontact cooling water from facilities such as power plants; pit pumpout and surface runoff from mining and quarrying operations, where the principal source of pollutants is the land disturbing activity rather than the addition of any chemicals or organic materials; or complex mixtures of organic and inorganic pollutants from chemical manufacturing, textile processing, metal finishing, etc. Pathogens and chlorine residuals are rarely of concern with industrial discharges, but other conventional and toxic pollutants must be addressed on a case-by-case basis through the NPDES permitting process. Georgia's water quality assessment report identified one segment (2 miles) of river/stream in the basin where permitted industrial discharges contributed to a failure to support designated uses. This is being addressed through the NPDES permitting process.

The locations of permitted point source discharges of treated wastewater in the Tallapoosa River basin are shown in Figure 4-2.

Combined Sewer Overflows

Combined sewers are sewers that carry both storm water runoff and sanitary sewage in the same pipe. However, during wet weather, when significant storm water is carried in the combined system, the sanitary sewer capacity is exceeded and a combined sewer overflow (CSO) occurs. The surface discharge is a mixture of storm water and sanitary waste. There are no known CSOs within the Tallapoosa Basin.

NPDES Permitted Storm Water Discharges

Urban storm water however, during wet weather, has been identified as a major source of stressors from pollutants such as oxygen-demanding waste (BOD) and fecal coliform bacteria. Storm water can flow directly to streams as a diffuse, nonpoint process or can be collected and discharged through a storm sewer system. Storm sewers are now subject to NPDES permitting and are discussed in this section. Contributions from nonpoint storm water is discussed in later sections.

Pollutants typically found in urban storm water runoff include pathogens (such as bacteria and viruses from human and animal waste), heavy metals, debris, oil and grease, petroleum hydrocarbons and a variety of compounds toxic to aquatic life. In addition, the runoff often contains sediment, excess organic material, fertilizers (particularly nitrogen and phosphorus compounds), herbicides, and pesticides, which can upset the natural balance of aquatic life in lakes and streams. Storm water runoff can also increase the temperature of a receiving stream during warm weather which can have an adverse impact on aquatic life. All of these pollutants, and many others, influence the quality of storm water runoff. There are also many potential problems related to the quantity of urban runoff, which can contribute to flooding and erosion in the immediate drainage area and downstream.

Municipal Storm Water Discharges

In accordance with Federal "Phase I" storm water regulations, the state of Georgia has issued individual areawide NPDES municipal separate storm sewer system (MS4) permits to 58 cities and counties in municipal areas with populations greater than 100,000 persons. There are no MS4 permits in the Tallapoosa basin.

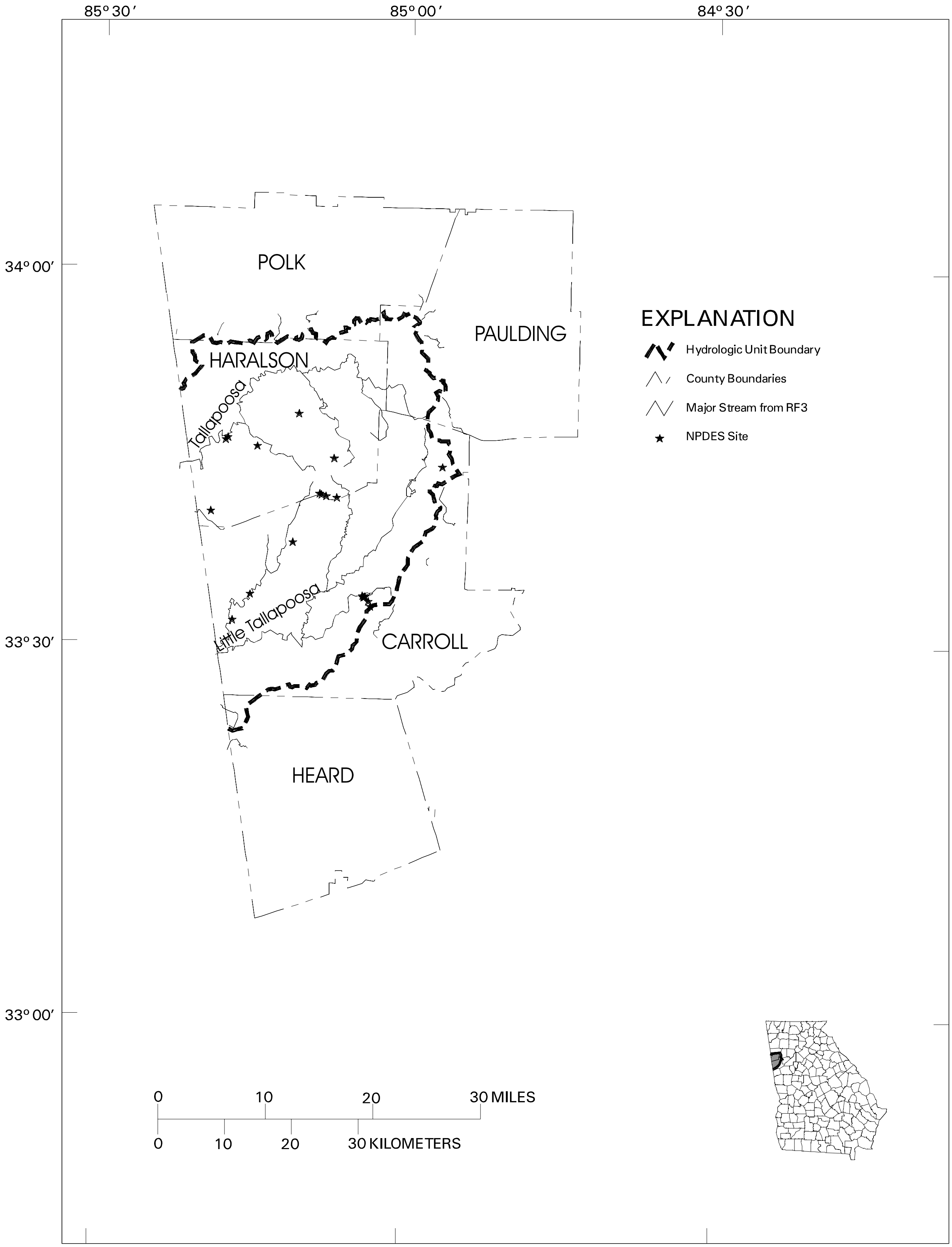


Figure 4-2. NPDES Sites Permitted by GAEPD, Tallapoosa River Basin

Industrial Storm Water Discharges

Industrial sites often have their own storm water conveyance systems. The volume and quality of storm water discharges associated with industrial activity is dependent on a number of factors, such as the industrial activities occurring at the facility, the nature of the precipitation, and the degree of surface imperviousness. These discharges are of intermittent duration with short-term pollutant loadings that can be high enough to have shock loading effects on the receiving waters. The types of pollutants from industrial facilities are generally similar to those found in storm water discharges from commercial and residential sites; however, industrial facilities have a significant potential for discharging at higher pollutant concentrations and may include specific types of pollutants associated with a given industrial activity.

EPD has issued one general permit regulating storm water discharges for 10 of 11 federally regulated industrial subcategories. The 11th subcategory, construction activities, will be covered under a separate general permit. The general permit for industrial activities requires the submission of a Notice of Intent (NOI) for coverage under the general permit; the preparation and implementation of a storm water pollution prevention plan; and, in some cases, the monitoring of storm water discharges from the facility. As with the municipal storm water permits, implementation of site-specific best management practices is the preferred method for controlling storm water runoff. As of March 1998, 50 NOIs had been filed for the Tallapoosa basin.

Nondischarging Waste Disposal Facilities

Land Application Systems (LASs)

In addition to permits for point source discharges, EPD has developed and implemented a permit system for land application systems (LASs). LASs for final disposal of treated wastewaters have been encouraged in Georgia and are designed to eliminate surface discharges of effluent to waterbodies. LASs are used as alternatives to advanced levels of treatment or as the only alternative in some environmentally sensitive areas.

When properly operated, a LAS should not be a source of stressors to surface waters. The locations of LASs are, however, worth noting because of the (small) possibility that a LAS could malfunction and become a source of stressor loading.

In excess of 200 permits for land application systems were in effect in Georgia in 1998. Land application systems within the Tallapoosa Basin are listed in Table 4-3. The locations of all LASs within the basin are shown in Figure 4-3.

Table 4-3. Wastewater Land Application Systems in the Tallapoosa Basin

Operator	Location	Permit No.	Permitted Flow (MGD)
Bremen LAS	Carroll Co.	GA02-142	0.200
Carrollton LAS	Carroll Co.	GA02-126	7.000
Temple LAS	Carroll Co.	GA02-134	0.200

Landfills

Permitted landfills are required to contain and treat any leachate or contaminated run-off prior to discharge to any surface water. The permitting process encourages either direct connection to a publicly owned treatment works (although vehicular transportation is allowed in certain cases) or treatment and recirculation on site to achieve a no-discharge system. Direct discharge in compliance with NPDES requirements is allowed

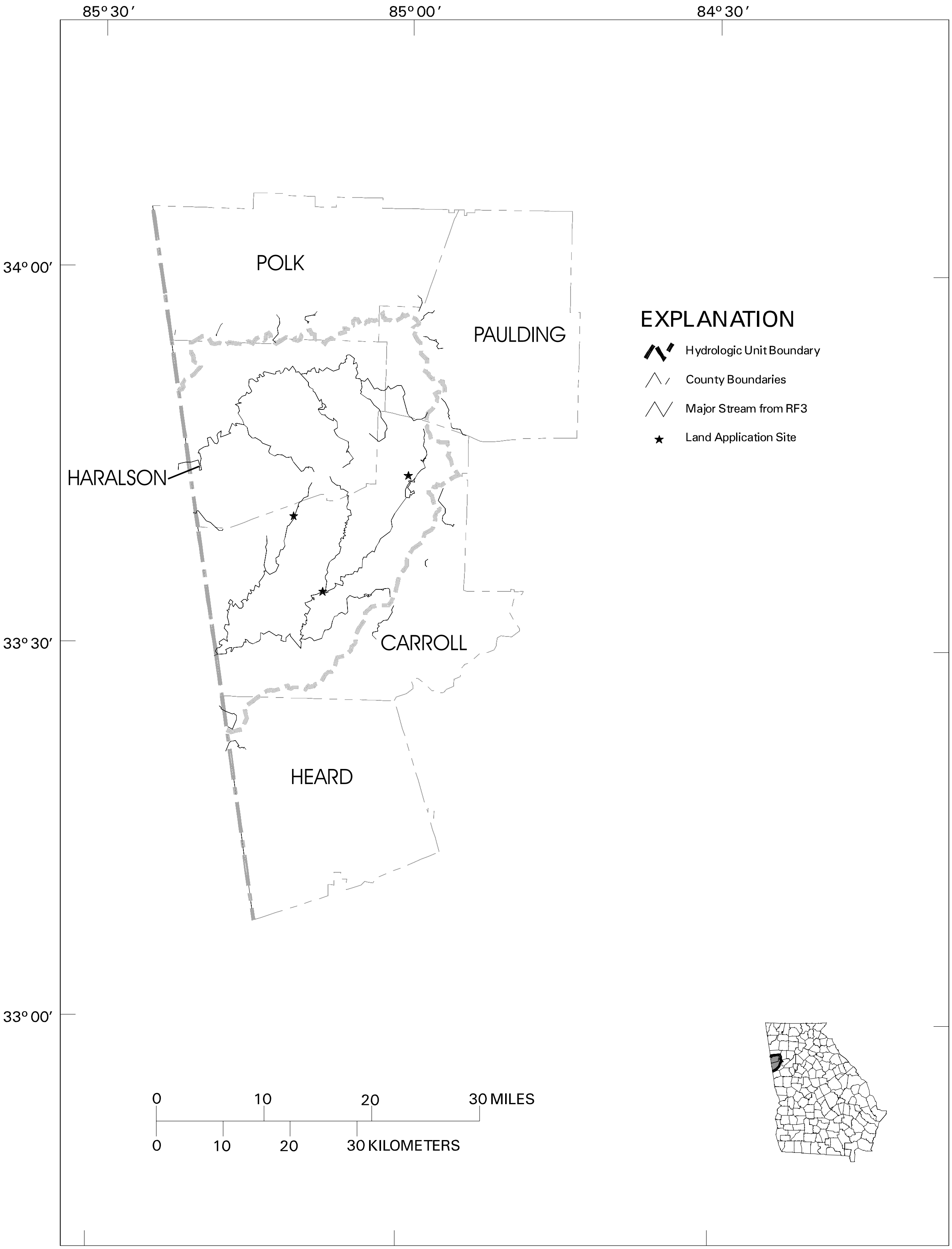


Figure 4-3. Land Application Systems, Tallapoosa River Basin

but not currently practiced at any landfills in Georgia. Ground water contaminated by landfill leachate from older, unlined landfills represents a potential threat to waters of the State. Ground water and surface water monitoring and corrective action requirements are in place for all landfills operated after 1988 to identify and remediate potential threats. The provisions of the Hazardous Sites Response Act address threats posed by older landfills as releases of hazardous constituents are identified. All new municipal solid waste landfills are required to be lined and to have a leachate collection system installed.

EPD's Land Protection Branch is responsible for permitting and compliance of municipal and industrial Subtitle D landfills. The locations of permitted landfills within the basin are shown in Table 4-4 and Figure 4-4.

Table 4-4. Permitted Landfills in the Tallapoosa River Basin

PERMIT NO.	NAME	COUNTY	TYPE
022-004D(L)	Nobles Sludge Disposal Co.	Carroll	Landfill
022-008D(SL)*	Carrollton SR 166	Carroll	Sanitary Landfill
071-004D(SL)	US 78 Bremen PH1	Haralson	Sanitary Landfill
071-005D(SL)	US 78 Bremen PH2	Haralson	Sanitary Landfill

** Landfill owner currently implementing closure procedures.*

4.1.2 Nonpoint Sources

The pollution impact on Georgia's streams has radically shifted over the last two decades. Streams are no longer dominated by untreated or partially treated sewage discharges, which had resulted in little or no oxygen and little or no aquatic life. The sewage is now treated, oxygen levels have recovered, and healthy fisheries have followed. Industrial discharges have also been placed under strict regulation. However, other sources of pollution are still affecting Georgia's streams. These sources are referred to as *nonpoint sources*. Nonpoint sources are diffuse in nature. Nonpoint source pollution can generally be defined as the pollution caused by rainfall or snowmelt moving over and through the ground. As water moves over and through the soil, it picks up and carries away natural pollutants and pollutants resulting from human activities, finally depositing them in lakes, rivers, wetlands, coastal waters, or ground water. Habitat alteration (e.g., removal of riparian vegetation) and hydrological modification (e.g., channelization, bridge construction) can cause adverse effects on the biological integrity of surface waters and are also treated as nonpoint sources of pollution.

Nonpoint pollutant loading comprises a wide variety of sources not subject to point source control through NPDES permits. The most significant nonpoint sources are those associated with precipitation, washoff, and erosion, which can move pollutants from the land surface to water bodies. Both rural and urban land uses can contribute significant amounts of nonpoint pollution. A review of 1996-1997 water quality assessment results for the Tallapoosa basin indicates that urban runoff and rural nonpoint sources contribute significantly to lack of full support for designated uses. The major categories of stressors for nonpoint sources are discussed below.

Nonpoint Sources from Agriculture

Agricultural operations can contribute stressors to water bodies in a variety of ways. Tillage and other soil-disturbing activities can promote erosion and loading of sediment to water bodies, unless controlled by management practices. Nutrients contained in fertilizers, animal wastes, or natural soils may be transported from agricultural land to streams in either sediment-attached or dissolved forms. Loading of pesticides and pathogens is also of concern for various agricultural operations.

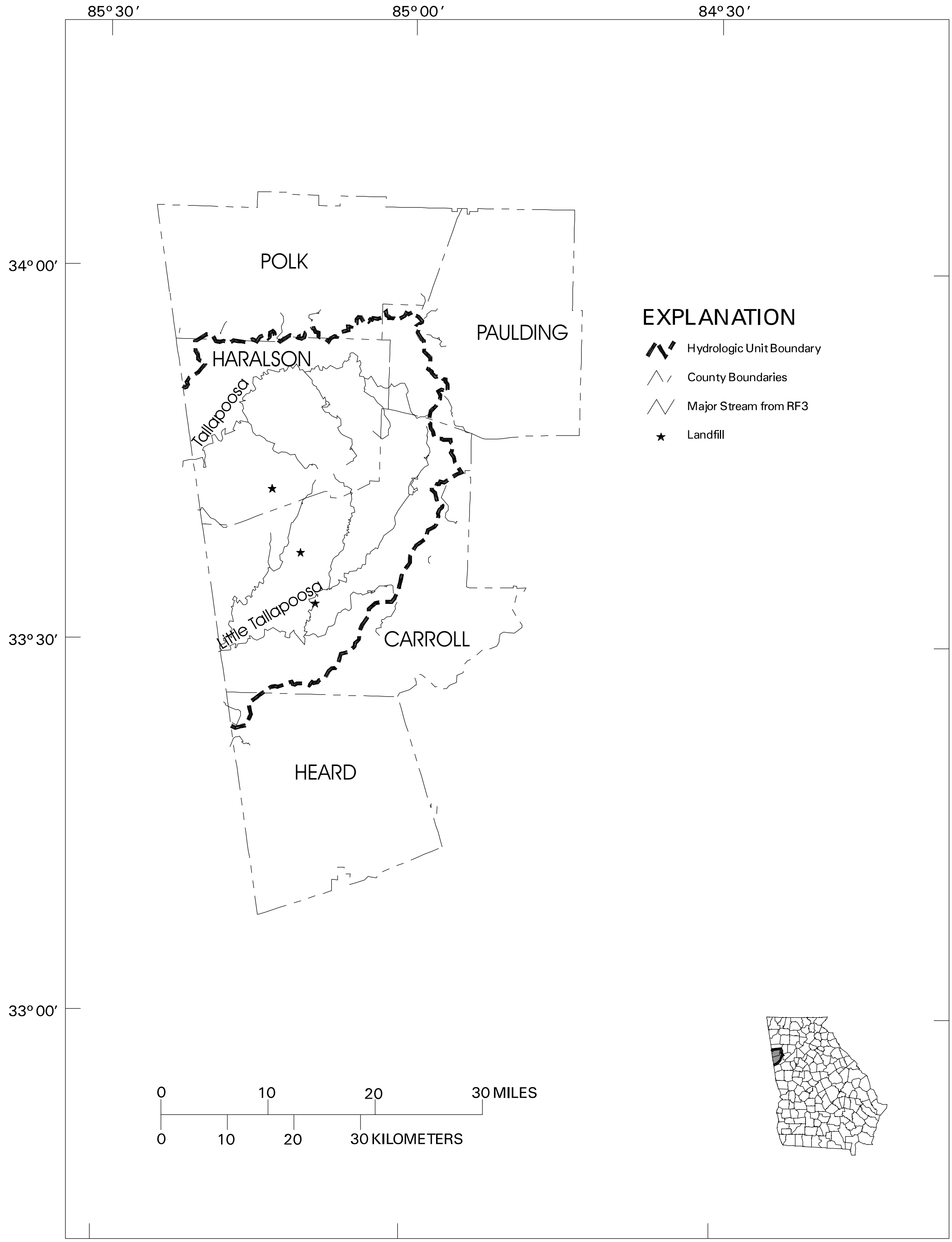


Figure 4-4. Landfills, Tallapoosa River Basin

Sediment and Nutrients

Sediment is the most common pollutant resulting from agricultural operations. It consists mainly of mineral fragments resulting from the erosion of soils, but it can also include crop debris and animal wastes. Excess sediment loads can damage aquatic habitat by smothering and shading food organisms, altering natural substrate, and destroying spawning areas. Runoff with elevated sediment concentrations can also scour aquatic habitat, causing significant impacts on the biological community. Excess sediment can also increase water treatment costs, interfere with recreational uses of water bodies, create navigation problems, and increase flooding damage. In addition, a high percentage of nutrients lost from agricultural lands, particularly phosphorus, is transported attached to sediment. Many organic chemicals used as pesticides or herbicides are also transported predominantly attached to sediment.

Agriculture can be a significant source of nutrients, which can lead to excess or nuisance growth of aquatic plants and depletion of dissolved oxygen. The nutrients of most concern from agricultural land uses are nitrogen (N) and phosphorus (P), which may come from commercial fertilizer or land application of animal wastes. Both nutrients assume a variety of chemical forms, including soluble ionic forms (nitrate and phosphate) and less-soluble organic forms. Less soluble forms tend to travel with sediment, whereas more soluble forms move with water. Nitrate-nitrogen is very weakly adsorbed by soil and sediment and is therefore transported entirely in water. Because of the mobility of the nitrate-nitrogen the major route of nitrate loss is to streams by interflow or to ground water in deep seepage.

Phosphorus transport is a complex process that involves different components of phosphorus. Soil and sediment contain a pool of adsorbed phosphorus which tends to be in equilibrium with the phosphorus in solution (phosphate) as water flows over the soil surface. The concentrations established in solution are determined by soil properties and fertility status. Adsorbed phosphorus attached to soil particles suspended in runoff also equilibrates with the phosphorus in solution.

In 1993, the Soil Conservation Service (SCS, now NRCS) completed a study to identify hydrologic units in Georgia with high potential for nonpoint source pollution problems resulting from agricultural land uses (SCS, 1993). This study concluded that there is not a major statewide agricultural pollution problem in Georgia. However, the assessment shows that some watersheds have sufficient agricultural loadings to potentially impair their designated uses, based on estimates of transported sediments, nutrients, and animal waste from agricultural lands (Table 4-5).

Table 4-5. Estimated Loads from Agricultural Lands by County (SCS, 1993)

County	Percent of Area in Basin	Acres with nutrient application	Sediment (tons)	Sediment (ppm)	Nitrogen (tons)	Nitrogen (ppm)	Phosphorus (tons)	Phosphorus (ppm)
Carroll	67	74,757	57,736	24.4	307	0.15	101	0.048
Haralson	97	23,554	22,232	33.1	142	0.21	42	0.063
Paulding	10	42,409	9,882	8.2	58	0.05	20	0.017

Note: Mass estimates are based on county-wide averages, weighted by percent of area in the basin. Concentration estimates are average event runoff concentration from agricultural lands in the basin.

In July and August 1996, EPA conducted biological assessments on Georgia watersheds that had sufficient agricultural loading to potentially impair designated stream use to determine which of those waters should be added Georgia's Section 303(d) list of streams with water quality-limited segments. Those waters identified by EPA as potentially impaired by agricultural nonpoint source loading and added to the 303(d) TMDL list in December 1996 are shown in Table 4-6.

Table 4-6. Waters Identified as Potentially Impacted by Agricultural Nonpoint Source Loading and Added to the Georgia 303(d) List

Waterbody	County	Pollutant(s) of Concern
Lower Little Tallapoosa River	Carroll	Habitat/Sediment
Little Tallapoosa River	Carroll	Biota, Habitat

Animal waste

In addition to contributing to nutrient loads, animal waste may contribute high loads of oxygen-demanding chemicals and bacterial and microbial pathogens. The waste may reach surface waters through direct runoff as solids or in their soluble form. Soluble forms may reach ground water through runoff, seepage, or percolation and reach surface water as return flow. As the organic materials decompose, they place an oxygen demand on the receiving waters, which may adversely affect fisheries; and cause other problems with taste, odor, and color. When waters are contaminated by waste from mammals, the possible presence of pathogens that affect human health, including fecal bacteria, is of particular concern when waters are contaminated by waste from mammals. In addition to being a source of bacteria, cattle waste might be an important source of the infectious oocysts of the protozoan parasite *Cryptosporidium parvum*.

Pesticides

Pesticides applied in agricultural production can be insoluble or soluble and include herbicides, insecticides, miticides, and fungicides. They are primarily transported directly through surface runoff, either in dissolved form or attached to sediment particles. Some pesticides can cause acute and chronic toxicity problems in the water or throughout the entire food chain. Others are suspected human carcinogens, although the use of such pesticides has generally been discouraged in recent years.

The major agricultural pesticides/herbicides used within the basin include 2,4D, Weedmaster, Hoelon, Trifluralin/Treflan/Trilin, AAtrex/Atrazine, and Gramoxone (compiled from the Georgia Herbicide Use Survey Summary [Monks and Brown, 1991]).

Nonherbicide pesticide use is difficult to estimate. According to Stell et al. (1995), pesticides other than herbicides are currently used only when necessary to control some type of infestation (nematodes, fungi, insects). Other common nonherbicide pesticides include chlorothalonil, aldicarb, chlorpyrifos, methomyl, thiodicarb, carbaryl, acephate, fonofos, methyl parathion, terbufos, disulfoton, phorate, triphenyltin hydroxide (TPTH), and synthetic pyrethroids/pyrethrins. Application periods of the principal agricultural pesticides span the calendar year in the basin. However, agricultural pesticides are applied most intensively and on a broader range of crop types from March 1 to September 30 of any given year.

It should be noted that past uses of persistent agricultural pesticides that are now banned might continue to affect water quality within the basin, particularly through residual concentrations present in bottom sediments.

A survey of pesticide concentration data by Stell et al. (1995) found that two groups of compounds had concentrations at or above minimum reporting levels in nearly 56 percent of the water and sediment analyses in the Apalachicola-Chattahouchee-Flint basin. The first group included DDT and metabolites, and chlordane and related compounds (heptachlor, heptachlor epoxide), while dieldrin was also frequently detected. All these pesticides are now banned by US EPA for use in the United States, but they might persist in the environment for long periods of time.

Nonpoint Sources from Urban, Industrial, and Residential Lands

Water quality in urban waterbodies is affected by both point source discharges and diverse land use activities in the drainage basin (i.e., nonpoint sources). One of the most important sources of environmental stressors in the Tallapoosa basin, particularly in the developed and rapidly growing areas close to Atlanta, is diffuse runoff from urban, industrial, and residential land uses (jointly referred to as "urban runoff"). Nonpoint source contamination can impair streams that drain extensive commercial and industrial areas, due to inputs of storm water runoff, unauthorized discharges, and/or accidental spills. Wet weather urban runoff can carry high concentrations of many of the same pollutants found in point source discharges, such as oxygen-demanding waste, suspended solids, synthetic organic chemicals, oil and grease, nutrients, lead and other metals, and bacteria. The major difference is that urban runoff occurs only intermittently, in response to precipitation events.

The characteristics of nonpoint urban sources of pollution are generally similar to those of NPDES permitted storm water discharges (these are discussed in the previous section). Separate storm water systems, however, are typically found in developed areas with high imperviousness and, frequently, sanitary sewer systems. Nonpoint urban sources of pollution include drainage from some built-up areas with similar characteristics, but also includes less highly developed areas with greater amounts of pervious surfaces. Nonpoint urban sources of pollution include drainage from areas with impervious surfaces, as well as, less highly developed areas with greater amounts of pervious surfaces such as lawn, gardens, and septic tanks, all of which may be sources of nutrient loading.

There is little site-specific data available to quantify loading in nonpoint urban runoff in the Tallapoosa River basin, although estimates of loading rates by land use types have been widely applied in other areas. Data for metals, organic chemicals, biological conditions, and suspended sediment were generally unavailable. Peters and Kandell (1997) present a water quality index for streams in the Atlanta region, based primarily on nutrients and nutrient-related parameters. They report that the annual average index of water quality conditions generally improved at most long-term monitoring sites between 1986 and 1995. However, conditions markedly worsened between 1994 and 1995 at several sites where major development was ongoing.

Pesticides and Herbicides from Urban and Residential Lands

Urban and suburban land uses are also a potential source of pesticides and herbicides through application to lawns and turf, roadsides, and gardens and beds. Stell et al. (1995) provide a summary of usage in the Atlanta Metropolitan Statistical Area (MSA). The herbicides most commonly used by the lawn-care industry are combinations of dicamba, 2,4-D, mecoprop (MCPP), 2,4-DP, and MCPA, or other phenoxy-acid herbicides. Most commercially available weed control products contain one or more of the following compounds: glyphosphate, methyl sulfometuron, benefin (benfluralin), bensulide, acifluorfen, 2,4-D, 2,4-DP, and dicamba. Atrazine was also available for purchase until it was restricted by the state of Georgia on January 1, 1993. The main herbicides used by local and state governments are glyphosphate, methyl sulfometuron, MSMA, 2,4-D, 2,4-DP, dicamba, and chlorsulforon. Herbicides are used for preemergent control of crabgrass in February and October and for postemergent control in the summer. Data from the 1991 Georgia Pest Control Handbook (Delaplane, 1991) and a survey of CES and SCS personnel conducted by Stell *et al*. indicate that several insecticides could be considered ubiquitous in urban/suburban use, including chlorpyrifos, diazinon, malathion, acephate, carbaryl, lindane, and dimethoate. Chlorothalonil, a fungicide, is also widely used in urban and suburban areas.

Other Urban/Residential Sources

Urban and residential storm water also potentially includes pollutant loads from a number of other terrestrial sources:

Septic Systems. Poorly sited and improperly operating septic systems can contribute to the discharge of pathogens and oxygen-demanding pollutants to receiving streams. This problem is addressed through septic system inspections by the appropriate County Health Department, extension of sanitary sewer service and local regulations governing minimum lot sizes and required pump-out schedules for septic systems.

Leaking Underground Storage Tanks. The identification and remediation of leaking underground storage tanks (LUSTs) is the responsibility of the EPD Land Protection Branch. Petroleum hydrocarbons and lead are typically the pollutants associated with such tanks.

Nonpoint Sources from Forestry

Forest is the dominant land cover in the Tallapoosa Basin, accounting for 97 percent of the land area in 1989. Undisturbed forest land generally presents very low stressor loading compared to other land uses, while conversion of forest to urban/residential land uses is often associated with water quality degradation. From 1982 through 1989, the area classified as commercial forest land within the Tallapoosa basin decreased by approximately 2,412 acres, or 1 percent.

Silvicultural operations may serve as sources of stressors, primarily contributing excess sediment loads to streams, when best management practices (BMPs) are not followed. From a water quality standpoint, woods roads pose the greatest potential threat of any of the typical forest practices. It has been documented that 90 percent of the sediment that entered streams from a forestry operation was typically related to either poorly located or poorly constructed roads. The potential impact on water from erosion and sedimentation is increased if BMPs are not adhered to.

Statewide BMP Implementation Survey

In 1992, the Georgia Forestry Commission (CFC) conducted a statewide BMP implementation survey to determine to what extent forestry BMPs were being implemented. Within the Tallapoosa basin, the GFC evaluated 3 sites of which two were located on private lands and one was located on forest industry land. Overall compliance with BMPs was 81 percent.

Almost half of main haul roads on two sites were in compliance with BMPs. Problems were noted where roads did not follow the contour and where water diversions to slow surface water flow and divert the flow out of the road on either site were needed but were not installed. By ownership, compliance was 54 percent on the 1.3 miles of forest industry road and 0 percent on the 0.3 miles of private land owner road. The roads, however, did not cross any streams and there was no threat to water quality.

Eighty-one percent of the 250 harvested acres evaluated on 3 sites were in compliance with BMPs. Problems were noted where water bars were not installed in skid trails sites on sloping terrain. Two out of three log decks were stabilized. Equipment was improperly serviced on two of three sites. Harvesting within the recommended Streamside Management Zones (SMZs) resulted in 50 percent of the zones being rutted or damaged and excess logging debris left in the streams on 50 percent of the sites. Log decks were usually properly located outside recommended zone. Temporary stream crossings occurred on one site and was properly removed after the harvest. By ownership, compliance was 46 percent on 50 total acres of two private tracts and 90 percent on the 200 acre forest industry tract.

Pesticides and Herbicides from Silviculture

Silviculture is also a potential source of pesticides/herbicides. According to Stell et al. (1995), pesticides are mainly applied during site preparation after clear-cutting and during the first few years of new forest growth. Site preparation occurs on a 25-year cycle on most pine plantation land, so the area of commercial forest with pesticide application in a given year is relatively small. The herbicides glyphosate (Accord), sulfometuron methyl (Oust), hexazinone (Velpar), imazapyr (Arsenal), and metsulfuron methyl (Escort) account for 95 percent of the herbicides used for site preparation to control grasses, weeds, and broadleaves in pine stands. Dicamba, 2,4-D, 2,4,-DP (Banvel), triclopyr (Garlon), and picloram (Tordon) are minor use chemicals used to control hard to kill hardwoods and kudzu. The use of triclopyr and picloram has decreased since the early 1970s.

Most herbicides are not mobile in the soil and are targeted to plants, not animals. Applications made following the label instructions and in conjunction with BMPs should pose little threat to water quality.

Chemical control of insects and diseases is not widely practice except in forest tree nurseries, which is a very minor land use. No nurseries are in the basin.

Atmospheric Deposition

Atmospheric deposition can be a significant source of nitrogen and acidity in watersheds. Nutrients from atmospheric deposition, primarily nitrogen, are distributed throughout the entire basin in precipitation. The primary source of nitrogen in atmospheric deposition is nitrogen oxide emissions from combustion of fossil fuels. The rate of atmospheric deposition is a function of topography, nutrient sources, and spatial and temporal variations in climatic conditions.

Atmospheric deposition may also be a source of certain mobile toxic pollutants, including mercury, PCBs, and other organic chemicals.

4.1.3 Flow and Temperature Modification

Many species of aquatic life are adapted to specific flow and temperature regimes. In addition, both flow and temperature affect the dissolved oxygen balance in water, and changes in flow regime can have important impacts on physical habitat. Temperature is particularly critical for the cold-water trout fishery. Georgia is located at the extreme southern edge of trout habitat, and therefore many trout waters approach maximum tolerable temperatures during the hottest summer months, even under natural conditions. Trout need cold water to survive and reproduce well, so any practices that cause stream warming can have adverse effects.

Thus, flow and temperature modifications can be important environmental stressors. They also interact with one another to affect the oxygen balance: Flow energy helps control reaeration rate, while water temperature controls the solubility of dissolved oxygen. Higher water temperatures reduce oxygen solubility and thus tend to reduce dissolved oxygen concentrations. Further, increased water temperature increases the rate of metabolic activity in natural waters, which in turn can increase oxygen consumption by aquatic species.

Natural flows in the Georgia portion of the Tallapoosa basin remain essentially unaltered except for the limited impact of small watershed impoundments. Water temperature in many streams is cooler than many otherwise similar Piedmont streams because of numerous springs in the basin.

Trout waters in the Tallapoosa basin are potentially threatened by the impact of small impoundments. All of the trout streams in the basin are secondary trout streams (they are cold enough to support trout populations but no natural reproduction occurs) and actual trout fisheries are limited by the supply of trout for stocking. Even small impoundments, if not specifically designed to prevent stream warming, may impact temperatures for several miles downstream.

4.1.4 Physical Habitat Alteration

Many forms of aquatic life are sensitive to physical habitat disturbances. Probably the major disturbing factor is erosion and loading of excess sediment, which changes the nature of the stream substrate. Trout waters are particularly sensitive to sedimentation as trout need clean substrate to survive and reproduce well. Thus, any land use practices that cause excess sediment input can have significant impacts. Because of rapid development in the mountainous areas, the quality of trout streams is often compromised by sedimentation from land disturbing activities.

Physical habitat disturbance is also evident in many urban streams. Increased impervious cover in urban areas results in higher peak flows and lower drought flows. Higher peak flows increase bank erosion and lower low flows reduce the instream habitat available to aquatic life during drought periods. In addition, construction and other land-disturbing activities produce excessive sediment loads, resulting in choking of the natural substrate and altering the physical form of streams with mounds of sand and silt.

4.2 Summary of Stressors Affecting Water Quality

Section 4.1 described the major sources of loads of pollutants (and other types of stressors) to the Tallapoosa basin. Impacts within a waterbody are often the result of the combined effect of many different types of loading, including point and nonpoint sources. For instance, excess concentrations of nutrients may result from the combined loads of wastewater treatment plant discharges, runoff from agriculture, runoff from residential lots, and other sources. Accordingly, Section 4.2 brings together the information contained in Section 4.1 to focus on individual stressor types, as derived from all sources.

4.2.1 Nutrients

All plants require certain nutrients for growth, including the algae and rooted plants found in lakes, rivers, and streams. Nutrients required in the greatest amounts include nitrogen and phosphorus. Some loading of these nutrients is needed to support normal growth of aquatic plants, an important part of the food chain. Too much loading of nutrients can, however, result in an over abundance of algal growth with a variety of undesirable impacts. The condition of excessive nutrient-induced plant production is known as eutrophication, and waters affected by this condition are said to be eutrophic. Eutrophic waters often experience dense blooms of algae, which can lead to unaesthetic scums and odors and interfere with recreation. In addition, overnight respiration of living algae, and decay of dead algae and other plant material, can deplete oxygen from the water, stressing or killing fish. Eutrophication of lakes typically results in a shift in fish populations to less desirable, pollution tolerant species. Finally, eutrophication may result in blooms of certain species of blue-green algae that have the capability of producing toxins.

For freshwater aquatic systems, the nutrient in the shortest supply relative to plant demands is usually phosphorus. Phosphorus is then said to be the “limiting nutrient” because the concentration of phosphorus limits potential plant growth. Control of nutrient loading to reduce eutrophication thus focuses on phosphorus control.

Point and nonpoint sources to the Tallapoosa also discharge large quantities of nitrogen, but nitrogen is usually present in excess of amounts required to match the available phosphorus. Nitrogen (unlike phosphorus) is also readily available in the atmosphere and ground water, so it is not usually the target of management to control eutrophication in freshwater. The bulk of the nitrogen in fresh water systems is found in one of three ionic forms—ammonium (NH_4^+), nitrite (NO_2^-), or nitrate(NO_3^-). Nitrite and nitrate are more readily taken up by most algae, but ammonia is of particular concern because it can be toxic to fish and other aquatic life. Accordingly, wastewater treatment plant upgrades have focused on reducing the toxic ammonia component of nitrogen discharges, with corresponding increase in the nitrate fraction.

Nutrient Loads

The major sources of nutrient loading in the Tallapoosa basin are wastewater treatment facilities, urban runoff and storm water, and agricultural runoff. Concentrations found within rivers and lakes of the Tallapoosa basin represent a combination of a variety of point and nonpoint source contributions.

Point source loads can be quantified from permit and effluent monitoring data, but nonpoint loads are difficult to quantify. Rough estimates of average nutrient loading rates from agriculture are available; however, nonpoint loads from urban/residential sources in the basin have not yet been quantified. The net load arising from all sources may, however, be examined from instream monitoring. Long-term trends in nutrients within the Tallapoosa River basin can be obtained by examining results from EPD long-term trend monitoring stations.

Trend monitoring of total phosphorus is summarized in Table 4-7. Total phosphorus concentrations are relatively low in this basin, particularly in the Tallapoosa River, reflecting the low population and small level of development in the basin. Trends in loading of total phosphorus over time can be seen by examining trend monitoring data, as shown in Figure 4-5. Phosphorus concentrations in the Little Tallapoosa peaked in the late 1970s, and have generally declined since. This decline represents improved management of both point and nonpoint sources, with additional declines after 1989 attributable to legislation restricting the use of phosphate detergents. Phosphorus concentrations in the mainstem Tallapoosa River have remained relatively constant over time.

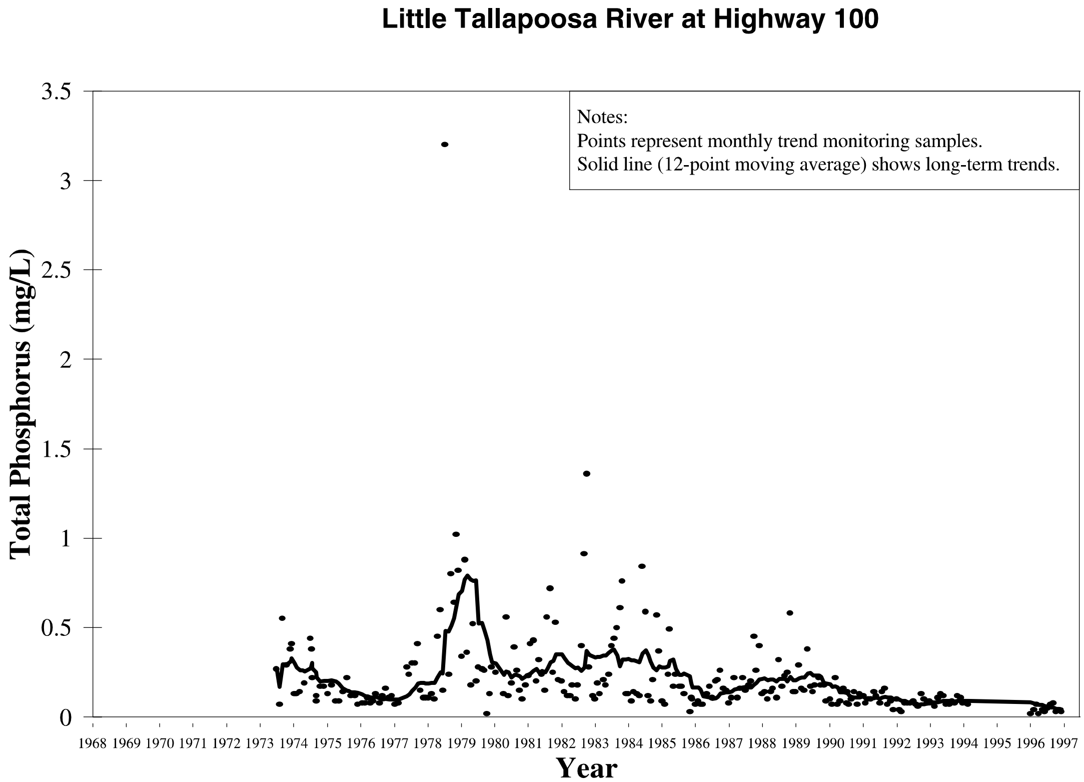
4.2.2 Oxygen Depletion

Oxygen is required to support aquatic life, and Georgia water quality standards specify minimum and daily average dissolved oxygen concentration standards for all waters. Problems with oxygen depletion in rivers and streams of the Tallapoosa basin are associated with oxygen-demanding wastes from point and nonpoint sources. Trend monitoring since 1973 indicates that dissolved oxygen concentrations in the Tallapoosa Basin are generally in excess of both the state instantaneous minimum of 4.0 mg/L and the state daily average minimum of 5.0 mg/L (Table 4-8). Concentrations between 4.0

Table 4-7. Trend Monitoring Summary for Total Phosphorus (mg/L) in the Tallapoosa River Basin

Station	Years	Average	Maximum	Minimum
Tallapoosa at Hwy.8 Station 13030001	1973-1996	0.06	0.29	0.02
Little Tallapoosa at Hwy. 100 Station 13010001	1973-1996	0.22	3.2*	0.02

** The next highest concentration observed during the period of record was 1.4 mg/L.*



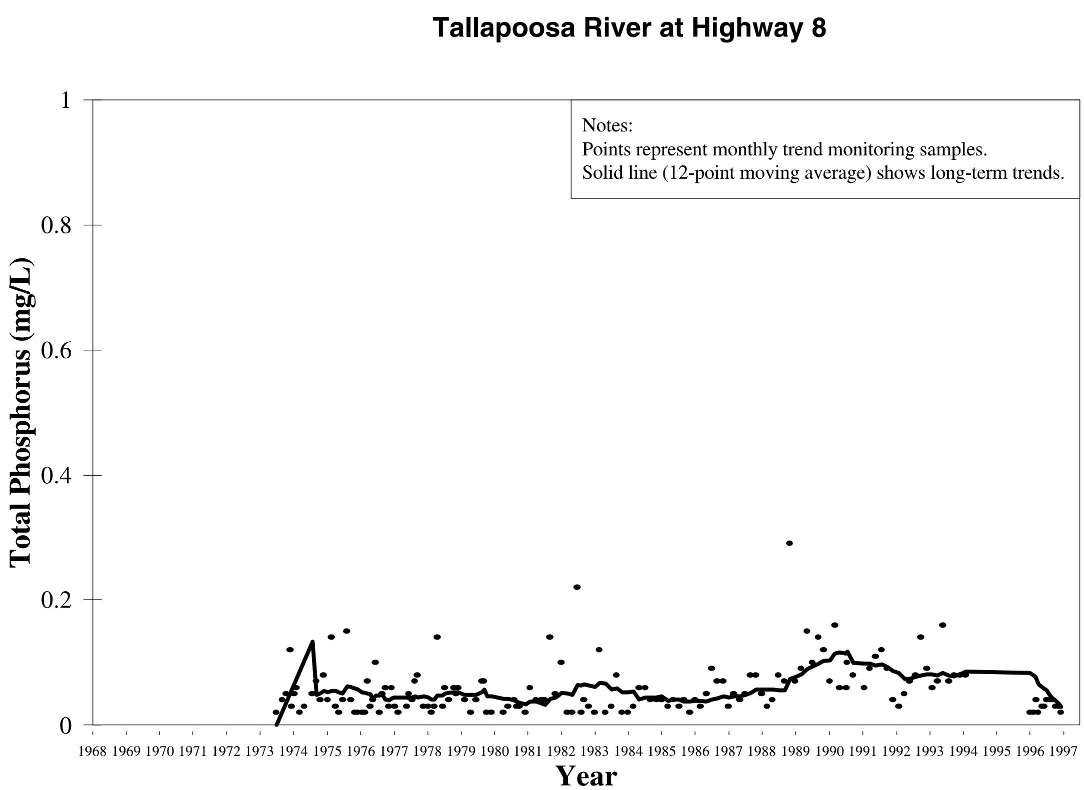


Figure 4-5. Total Phosphorus Concentrations in the Tallapoosa and Little Tallapoosa Rivers

Table 4-8. Trend Monitoring Summary for Dissolved Oxygen (mg/L) in the Tallapoosa River Basin

Station	Years	Average	Maximum	Minimum
Tallapoosa at Hwy. 8 Station 13030001	1973-1996	8.9	13.6	5.8
Little Tallapoosa at Hwy. 100 Station 13010001	1973-1996	8.2	12.7	4.1

and 5.0 mg/L have occasionally been observed in the Little Tallapoosa, but only prior to 1982, as shown in Figure 4-6. Dissolved oxygen concentrations have generally shown a slight increase with time at this station and have remained relatively stable at the mainstem Tallapoosa station.

4.2.3 Metals

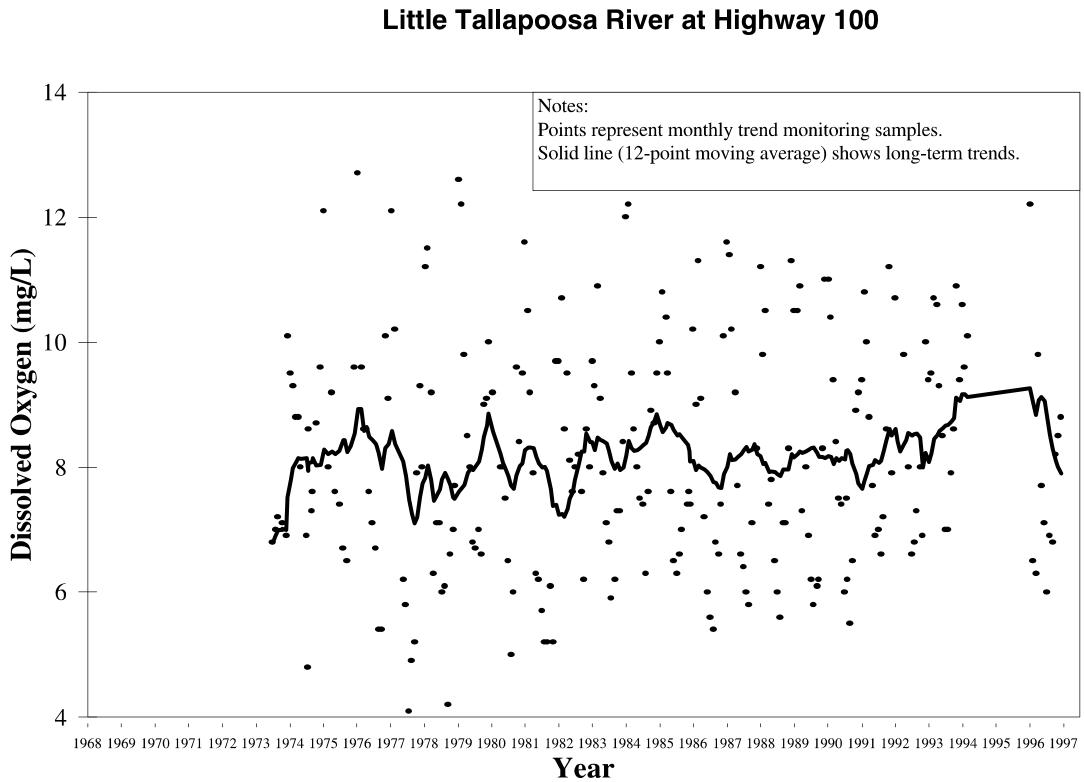
Violations of water quality standards for metals (e.g., lead, copper, zinc) were the second most commonly listed causes of nonsupport of designated uses in the 1996-1997 water quality assessment of the Tallapoosa basin, after fecal coliform bacteria. In most cases, these metals are attributed to nonpoint urban runoff and storm water. Point sources also contribute metals loads; however, major point sources of metals in the Tallapoosa basin (wastewater treatment plants and certain industrial discharges) have been brought into compliance with permit limits, leaving the more-difficult-to-control nonpoint sources as the primary cause of impairment.

It should be noted that sample data on metals in many streams is rather sparse, and there are concerns regarding the quality of some of the older data. Although urban runoff appears to be the primary source of loading of these stressors, loading rates have not been quantified and will require additional study.

4.2.4 Fecal Coliform Bacteria

Violations of the standard for fecal coliform bacteria were the most commonly listed cause of nonsupport of designated uses in the 1996-1997 water quality assessment. Fecal coliform bacteria are monitored as an indicator of fecal contamination and the possible presence of human bacterial and protozoan pathogens in water. Fecal coliform bacteria may arise from many of the different point and nonpoint sources discussed in Section 4.1. Human waste is of greatest concern as a potential source of bacteria and other pathogens. One primary function of wastewater treatment plants is to reduce this risk through disinfection. Observed violations of the fecal coliform standard below several wastewater treatment plants on the Tallapoosa River have generally been rapidly corrected in recent years.

Table 4-9 summarizes long term trend monitoring data for fecal coliform bacteria in the Tallapoosa River basin. State water quality standards for the fishing classification specify a 30-day geometric mean (four samples over 30 days) of 200 MPN/100 ml for May through October, and a geometric mean (four samples over 30 days) of 1,000 MPN/100 ml for November through April. Occasional high concentrations are expected during wet weather events, and are allowed for in the standard. The median or 50th percentile value is a useful summary of fecal coliform concentrations which is less sensitive to occasional high values than the average. At both Tallapoosa basin stations, the median is in the neighborhood of 200 MPN/100 ml, while the geometric means of the complete data series are 299 and 370 for the Tallapoosa and Little Tallapoosa.



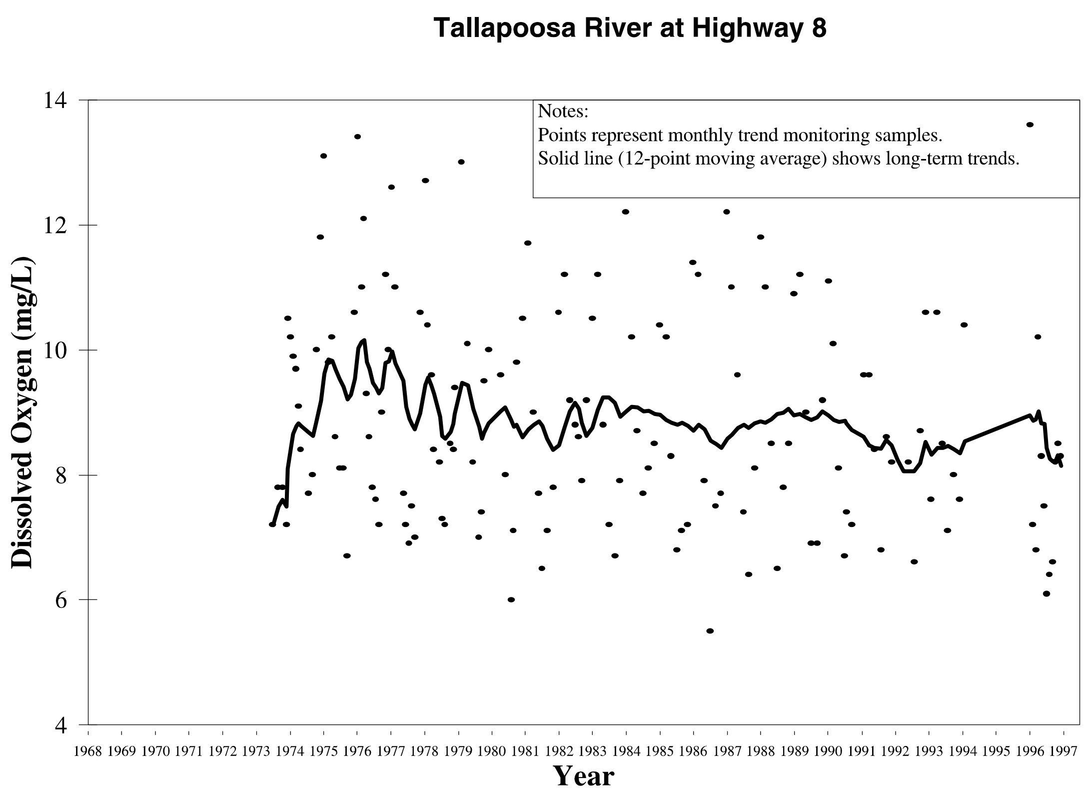


Figure 4-6. Dissolved Oxygen Concentrations in the Tallapoosa and Little Tallapoosa Rivers

Table 4-9. Trend Monitoring Summary for Fecal Coliform Bacteria (MPN/100 ml) in the Tallapoosa River Basin

Station	Years	Average	Geometric Mean	Maximum	Median
Tallapoosa at Hwy.8 13030001	1973-1996	1289	299	43000	170
Little Tallapoosa at Hwy. 100 13010001	1973-1996	1329	370	43000	230

Monthly trend-monitoring sampling is not sufficient to establish 30-day geometric means for comparison to the standard. The long-term averages and medians shown in Table 4-9 are generally inflated by data from earlier years prior to WPCP upgrades. For instance, monitoring in the Tallapoosa River at Georgia Highway 8 (Figure 4-7) shows a generally declining trend in fecal coliform bacteria concentrations from the late 1970s to the present (note the use of a logarithmic scale). In monitoring from 1990–1996, the median summer (May through October) concentration in the Tallapoosa River was 170 MPN/100 ml, which is below the geometric mean standard. In the Little Tallapoosa River at Highway 100 the median of 1990–1996 summer concentrations was 490 MPN/100 ml, indicating the need for continued improvements.

As point sources have been brought under control, nonpoint sources have become increasingly important as potential sources of fecal coliform bacteria. Nonpoint sources may include

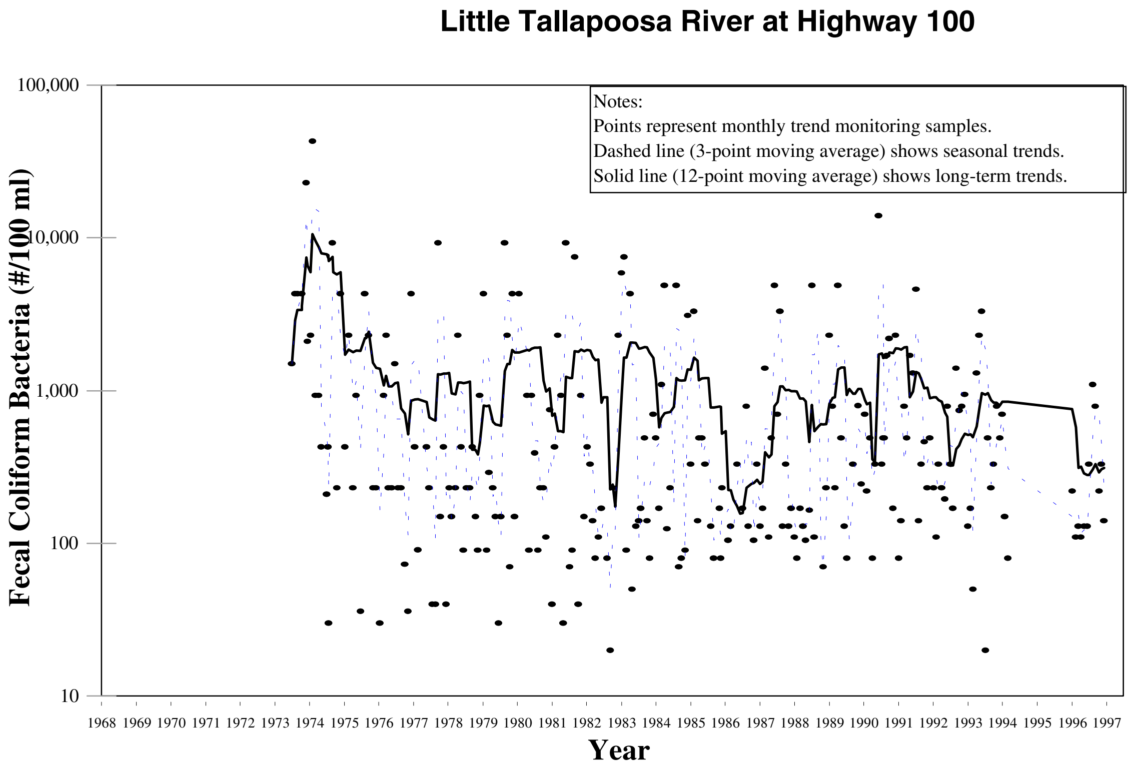
- Agricultural nonpoint sources, including concentrated animal operations and spreading and/or disposal of animal wastes.
- Runoff from urban areas transporting surface dirt and litter, which may include both human and animal fecal matter, as well as a fecal component derived from sanitary sewer overflows.
- Urban and rural input from failed or ponding septic systems.

4.2.5 Synthetic Organic Chemicals

Synthetic organic chemicals (SOCs) include pesticides, herbicides, and other man-made toxic chemicals. SOCs may be discharged to waterbodies in a variety of ways, including

- Industrial point source discharges.
- Wastewater treatment plant point source discharges, which often include industrial effluent as well as SOCs from household disposal of products such as cleaning agents and insecticides.
- Nonpoint runoff from agricultural and silvicultural land with pesticide and herbicide applications.
- Nonpoint runoff from urban areas, which may load a variety of SOCs such as horticultural chemicals and termiticides.
- Illegal disposal and dumping of wastes.

To date, SOCs have not been detected in the surface waters of the Tallapoosa River basin in problem concentrations. It should be noted, however, that most monitoring has been targeted to waters located below point sources where potential problems were suspected.



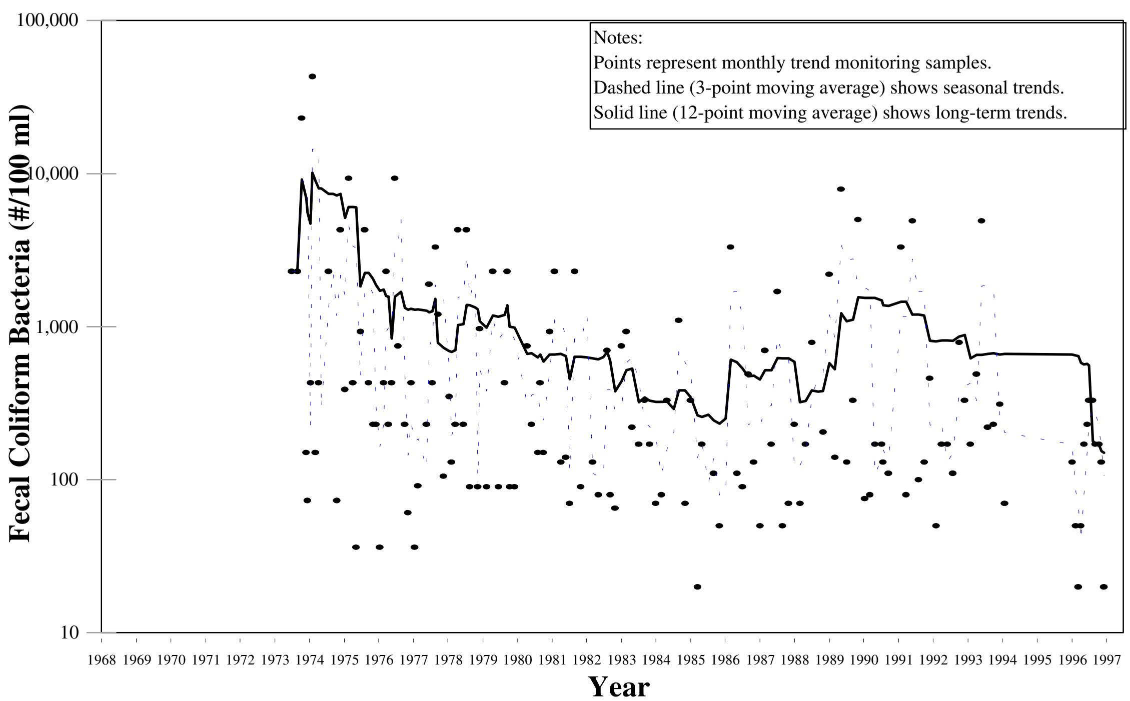


Figure 4-7. Fecal Coliform Bacteria Concentrations (MPN/100 ml) in the Tallapoosa and Little Tallapoosa Rivers

4.2.6 Stressors from Flow and Temperature Modification

Stress from flow modification in the Tallapoosa is primarily associated with the increased storm flows in smaller streams in developing areas as the percentage of impervious surfaces increases. During drought periods, the potential exists for flow depletion below water withdrawals in the basins. Expected natural minimum flows in streams of the basin vary with geology. Seven-day two-year recurrence low flows (7Q2) expressed on an areal basis for streams in this basin are estimated to range from about 0.16 to 0.28 cubic feet per second per square mile (Journey and Atkins, 1996).

Stress from temperature modifications is primarily a problem in small streams in designated trout watersheds. Small impoundments on such streams permanently alter water temperature regimes unless specific provisions are made to prevent such changes.

4.2.7 Sediment

Erosion and discharge of sediment can have a number of adverse impacts on water quality. First, sediment can carry attached nutrients, pesticides, and metals into streams. Second, sediment is itself a stressor. Excess sediment loads can alter habitat, destroy spawning substrate, and choke aquatic life, while high turbidity also impairs recreational and drinking water uses. Sediment loading is of concern throughout the basin, but is of greatest concern in the developing metropolitan areas and major transportation corridors. The rural areas are of lesser concern with the exception of rural unpaved road systems and areas where cultivated cropland exceeds 20 percent of the total land cover.

4.2.8 Habitat Degradation and Loss

In many parts of the Tallapoosa basin, support for native aquatic life is threatened by degradation of aquatic habitat. Habitat degradation is closely tied to sediment loading, and excess sediment is the main threat to habitat in rural areas with extensive land disturbing activities, as well as in urban areas where increased flow peaks and construction can choke and alter stream bottom substrates.

Water temperature increases due to the impacts of small impoundments also threaten trout habitat throughout the basin. As development increases in the basin, and as demand for water grows, the integrity of aquatic habitat may be threatened by reduced flows, particularly during the late summer and fall when stream flows are normally low.

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In This Section

- Assessment of Water Quantity
- Assessment of Water Quality

Section 5

Assessments of Water Quantity and Quality

This section provides an evaluation of the current conditions in the Tallapoosa River basin, in terms of both water quantity (Section 5.1) and water quality (Section 5.2) issues. The assessment results are combined with the evaluation of environmental stressors from Section 4 to produce a listing of Concerns and Priority Issues in Section 6.

5.1 Assessment of Water Quantity

Water quantity issues in the Tallapoosa River basin are being addressed comprehensively as part of the ACT/ACF study. In that process an Interstate Compact has been established to administer a water allocation formula which will partition the flow of the Tallapoosa River between Alabama and Georgia. The following sections provide a summary of preliminary findings from this study.

5.1.1 Municipal and Industrial Water Uses

As noted in Section 3.2, Municipal and Industrial (M&I) water demands in the Tallapoosa River basin are expected to increase by about 50 percent between 1995 and 2020, virtually all from surface water sources. The existing water resources in the Tallapoosa and Little Tallapoosa rivers in west Georgia will not be sufficient to meet projected demands for municipal and industrial supplies during drought conditions. Because of this expected shortfall, the West Georgia Water Authority proposes to construct the West Georgia Regional Reservoir on the Tallapoosa River in Haralson County approximately 6 miles upstream of the Alabama state line. (See Section 2). The reservoir would provide water to for Haralson, Carroll, and Paulding counties. The Authority is prepared to submit the necessary documents to support a Section 404 permit application upon completion of the ACT water allocation agreement. At that point the Corps of Engineers would evaluate the application, including potential and expected environmental impacts. It is expected that construction of the reservoir would provide a reliable water supply to the region for the foreseeable future.

Drinking Water Quality: Surface Water

Overall the surface water quality in the Tallapoosa River Basin is good for use as drinking water. All public water systems in the state of Georgia that use surface water meet the federal Surface Water Treatment Rules for filtration and treatment. However, surface water quality problems due to nonpoint source pollution such as agricultural and storm water runoff are concerns to municipalities that withdraw surface water from the Tallapoosa River and tributaries. The contaminant of most concern is high turbidity, especially rapid increases in turbidity due to erosion and sediment runoff. Water high in turbidity can clog filters, interrupt the proper treatment of raw water, and increase the cost of the water to the consumers because more chemicals must be applied to settle out the sediment. Table 5-1 summarizes the known and potential water quality problems affecting drinking water supplies associated with surface water intakes within the Tallapoosa basin.

Drinking Water Quality: Ground Water

Overall the ground water quality from wells is very good for use as drinking water. Since most wells used in public water systems are constructed by licensed well drillers and draw from deep aquifers, the number of contaminated wells is small. If a well exceeds the Maximum Contaminant Level (MCL) for a contaminant, it is removed from service or additional treatment is added to the system.

5.1.2 Agriculture

The water demand for agricultural use in the Tallapoosa basin is, and will remain for the foreseeable future, a small portion of the total demand. Whether taken from surface or ground water sources, there is no reason to believe that the supply will not be adequate, even during a drought year.

5.1.3 Recreation

Recreational use of surface waters in the Tallapoosa basin is limited to local fishing and boating on the rivers and farm ponds. There should be no concern about sufficiency of water availability for this purpose. There is potential for development of significant lake recreation activity on the West Georgia Regional Reservoir should construction be approved, however.

5.1.4 Hydropower

There is no hydropower production within the Georgia portion of the Tallapoosa basin.

5.1.5 Navigation

The Georgia portion of the Tallapoosa basin is not used for commercial navigation.

Table 5-I. Known and Potential Raw Water Quality Problems Affecting Drinking Water Supplies in the Tallapoosa Basin

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known Raw Water Quality Problems in the Past and Potential Future Problems	Other Comments
Bowdon	Turkey Creek	1	Y	1	Emergency intake only. Source is shallow and prone to rapid increases in turbidity.	Water System in compliance. Overall in good condition.
	Tisinger Reservoir	1			Primary source. Potential pollution concerns with pasture and agricultural land upstream and recreation allowed on lake.	
Carrollton	Little Tallapoosa River	1	N	1	Intake impacted by urban development runoff from communities up stream. Source has two reservoirs upstream to maintain water levels, but iron and manganese problems occur in wetlands between the reservoirs.	Water System in compliance. Overall in good condition.
Temple	Webster Creek	1	Y	1	Potential pollution concerns with pasture and agricultural land upstream. Also potential development upstream.	Water System in compliance. Overall in good condition.
Villa Rica	Lake Paradise	1	N	1	Intake located in headwaters of Little Tallapoosa. Shallow area of river prone to drought problems and taste and odor problems. Potential pollution concerns about development upstream.	Water System in compliance. Overall in good condition. City needs to work with private owner of Cowans Lake to determine future land use and BMP that could be put into place to prevent future degradation of water.
	Cowans Lake	1	N	1	Secondary intake that pumps to Lake Paradise for drought control. Private lake that is not owned by the city. Pasture land around the lake and some taste and odor problems due to wetland area. Concerns regarding potential residential development around the lake.	

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known Raw Water Quality Problems in the Past and Potential Future Problems	Other Comments
Bremen	Beech Creek Tributary	1	N	1	Primary intake. Urban development upstream has increased erosion and sedimentation problems including rapid turbidity increases and taste and odor problems. Erosion and sedimentation problems possibly due to lack of enforcement of code.	Water System in compliance. Overall in good condition. City and county needs to implement erosion and sedimentation codes in order to prevent future degradation of water. Also city and county need to work with owners of land around Bush Creek reservoir to implement forestry BMPs when timber is harvested.
	Bush Creek Reservoir	1	Y	1	Inactive intake. Water in reservoir is allocated for low flow use by Haralson county. Watershed is a forested area with virgin timber. Potential pollution concerns are erosion and sedimentation if the timber is harvested or if the watershed is developed.	
Haralson County Water Authority	Tallapoosa River	1	N	1	Urban development upstream has increased erosion and sedimentation problems including rapid turbidity increases. Occasionally the Authority experiences problems due to clogging of intake by leaves. Potential pollution concerns regarding transportation corridors Hwy 27 and 120 corridor. Intake has past problems with drought.	Water System in compliance. Overall in good condition. Due to drought problems in the area, county has spearheaded study for a potential larger reservoir on the Tallapoosa River.

5.1.6 Waste Assimilation Capacity

Sufficient flow for assimilation of treated wastewater in the Tallapoosa basin is not assured in a drought without construction of the West Georgia Regional Reservoir. Georgia has obligations under the Clean Water Act to meet instream water quality standards, and the state places a high priority on this obligation (See Section 6.0). Only under extreme drought conditions, when sufficient water flow is not available after domestic water supply needs are met, might there be insufficient water to meet instream water quality standards.

5.1.7 Assessment of Ground Water

There is only a very limited extent of ground water use in the Tallapoosa basin in Georgia. This upper basin resides on Piedmont geology (hard metamorphic rock), with groundwater found only in the overlying saprolite and in cracks and fractures in that rock. Ground water does not seem to be an issue in this area, since no municipal nor industrial permits have been granted in this Georgia portion of the basin, and agricultural irrigation use of ground water is quite minimal.

5.2 Assessment of Water Quality

This assessment of water quality generally reflects Georgia's water quality assessments for reporting to EPA under Section 305(b) of the Clean Water Act. It begins with a discussion of (1) water quality standards, (2) monitoring programs, and (3) data analyses to assess compliance with water quality standards and determine use support. Following this introductory material, detailed assessment results by subbasin are presented in Section 5.2.4.

5.2.1 Water Quality Standards

Assessment of water quality requires a baseline for comparison. A statewide baseline is provided by Georgia's water quality standards, which contain water use classifications, numeric standards for chemical concentrations, and narrative requirements for water quality.

Georgia's water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. The water use classification system was applied to interstate waters in 1972 by EPD. Table 5-2 provides a summary of water use classifications and basic water quality criteria for each water use. Georgia also has general narrative water quality standards, which apply to all waters. These narrative standards are summarized in Table 5-3.

In addition to the basic water quality standards shown above, Congress made changes in the Clean Water Act in 1987 which required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, in 1989 the Board of Natural Resources adopted 31 numeric standards for the protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a complete list of the toxic substance standards that apply to all waters in Georgia. Georgia has adopted all numeric standards for toxic substances promulgated by the US EPA. Georgia is also developing site-specific standards for major lakes where control of nutrient loading is required to prevent problems associated with eutrophication. There are no major lakes within the Georgia portion of the Tallapoosa basin.

Table 5-2. Georgia Water Use Classifications and Instream Water Quality Standards for Each Use

Use Classification	Bacteria (fecal coliform) 30-Day Geometric Mean[2] (MPN/100 ml)	Bacteria (fecal coliform) Maximum (MPN./100 ml)	Dissolved Oxygen (other than trout streams)[1] Daily Average (mg/l)	Dissolved Oxygen (other than trout streams)[1] Minimum (mg/l)	pH Std. Units	Temperature (other than trout streams)[1] Maximum Rise (°F)	Temperature (other than trout streams)[1] Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing[3]	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

1 *Standards for Trout Streams for dissolved oxygen are an average of 6.0 mg/l and a minimum of 5.0 mg/l. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2 °F is allowed in Secondary Trout Streams.*

2 *Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: the geometric mean of 2 and 18 is the square root of 36.*

3 *Standards are same as fishing with the exception of dissolved oxygen which is site specific.*

Table 5-3. Georgia Narrative Water Quality Standards for All Waters
(Excerpt from Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.03 - Water Use Classifications and Water Quality Standards)

(5) General Criteria for All Waters. The following criteria are deemed to be necessary and applicable to all waters of the State:

(a) All waters shall be free from materials associated with municipal or domestic sewage, industrial waste or any other waste which will settle to form sludge deposits that become putrescent, unsightly or otherwise objectionable.

(b) All waters shall be free from oil, scum and floating debris associated with municipal or domestic sewage, industrial waste or other discharges in amounts sufficient to be unsightly or to interfere with legitimate water uses.

(c) All waters shall be free from material related to municipal, industrial or other discharges which produce turbidity, color, odor or other objectionable conditions which interfere with legitimate water uses.

(d) All waters shall be free from toxic, corrosive, acidic and caustic substances discharged from municipalities, industries or other sources, such as nonpoint sources, in amounts, concentrations or combinations which are harmful to humans, animals or aquatic life.

(e) All waters shall be free from turbidity which results in a substantial visual contrast in a waterbody due to man-made activity. The upstream appearance of a body of water shall be observed at a point immediately upstream of a turbidity-causing man-made activity. The upstream appearance shall be compared to a point which is located sufficiently downstream from the activity so as to provide an appropriate mixing zone. For land disturbing activities, proper design, installation and maintenance of best management practices and compliance with issued permits shall constitute compliance with [this] Paragraph...

5.2.2 Surface Water Quality Monitoring

EPD's monitoring program integrates physical, chemical, and biological monitoring to provide information for water quality and use attainment assessments and for basin planning. EPD monitors the surface waters of the state to:

- collect baseline and trend data,

- document existing conditions,
- study impacts of specific discharges,
- determine improvements resulting from upgraded water pollution control plants,
- support enforcement actions,
- establish wasteload allocations for new and existing facilities,
- verify water pollution control plant compliance,
- document water use impairment and reasons for problems causing less than full support of designated water uses, and
- develop Total Maximum Daily Loads.

EPD uses a variety of monitoring tools to collect information to determine if the waterbodies are supporting its designated uses. These tools include trend monitoring, intensive surveys, lake, coastal, biological, fish tissue, and toxic substance monitoring, and facility compliance sampling. Each of these is briefly described in the following sections.

Continuous Trend Monitoring

During the late 1960s EPD initiated long-term monitoring of streams at strategic locations throughout Georgia called trend or ambient monitoring. This work is primarily accomplished through cooperative agreements with federal, state, and local agencies who collect samples from groups of stations at specific, fixed locations throughout the year. The cooperating agencies conduct certain tests in the field and send stream samples to EPD for additional laboratory analyses. Although there have been a number of changes over the years, routine chemical trend monitoring is still accomplished through similar cooperative agreements.

Today EPD contracts with the United States Geological Survey (USGS) for the majority of the trend sampling work. EPD associates also collect water and sediment samples for toxic substance analyses, as well as macroinvertebrate samples to characterize the biological community at selected locations as a part of the trend monitoring effort. Additional samples used in the 1996-97 Assessment were collected by other federal, state, and local governments, and universities. Trend monitoring stations located in the Tallapoosa basin in 1994 are shown in Figure 5-1.

Focused Trend Monitoring in the Tallapoosa River Basin

In 1995, EPD adopted and implemented significant changes to the strategy for trend monitoring in Georgia. The changes were implemented to support the River Basin Management Planning program. The number of fixed stations statewide was reduced in order to focus resources for sampling and analysis in a particular group of basins in any one year in accordance with the basin planning schedule. Sampling focus was placed on the Tallapoosa, Coosa, and Oconee basins during 1996 sampling.

Figure 5-2 shows the focused trend monitoring network for the Tallapoosa basin used in 1996. During this period statewide trend monitoring was continued at the thirty seven core station locations statewide, in the Savannah Harbor, in the Chattahoochee at Atlanta and Columbus, and at continuous monitoring locations. The remainder of the trend monitoring resources were devoted to the Tallapoosa, Coosa, and Oconee basins. As a result, more sampling was conducted in the focus river basins. Increasing the resolution of the water quality monitoring improves the opportunity to identify impaired waters, as well as the causes of impairment.

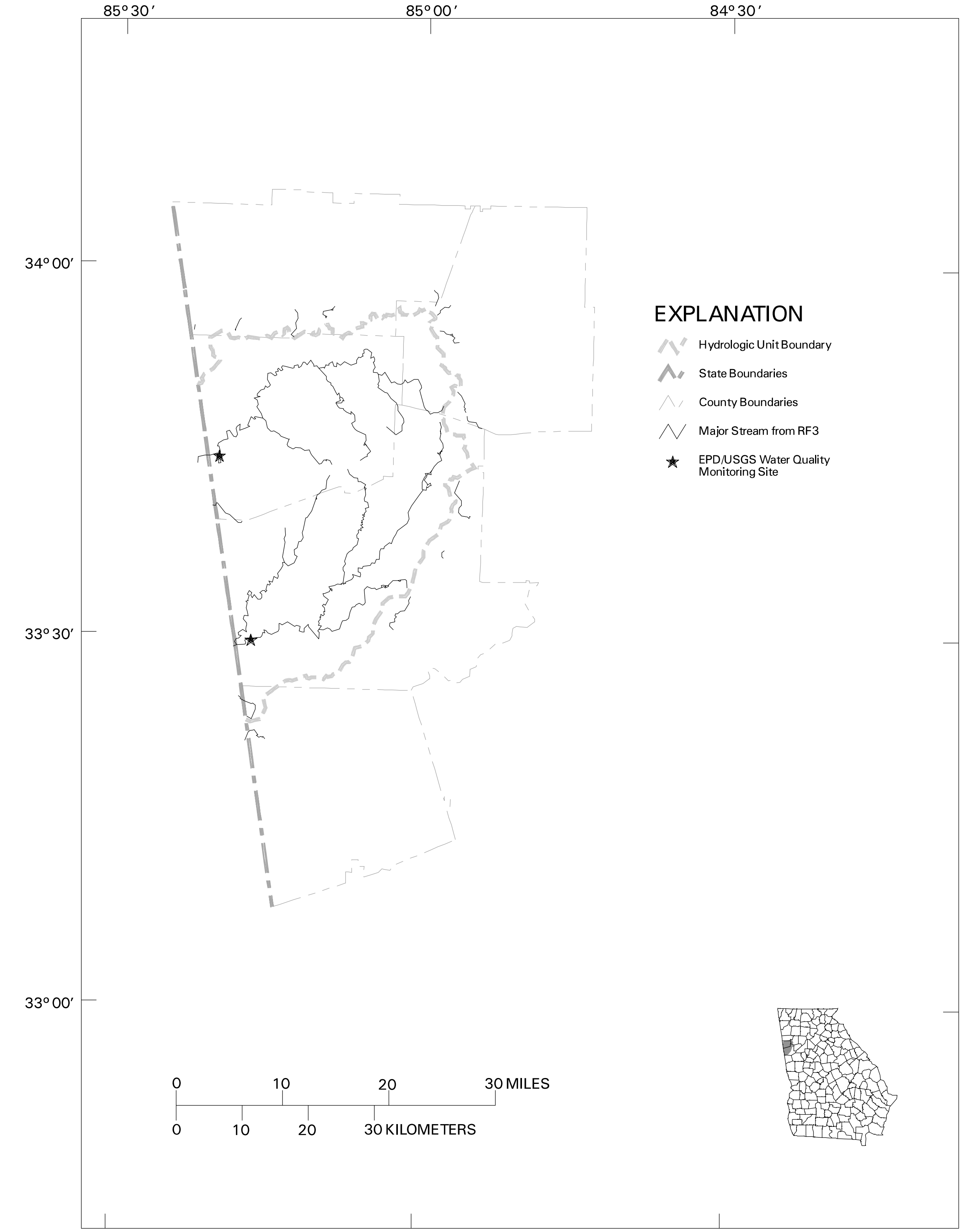


Figure 5-I. Tallapoosa Basin Fixed Sampling Station Locations

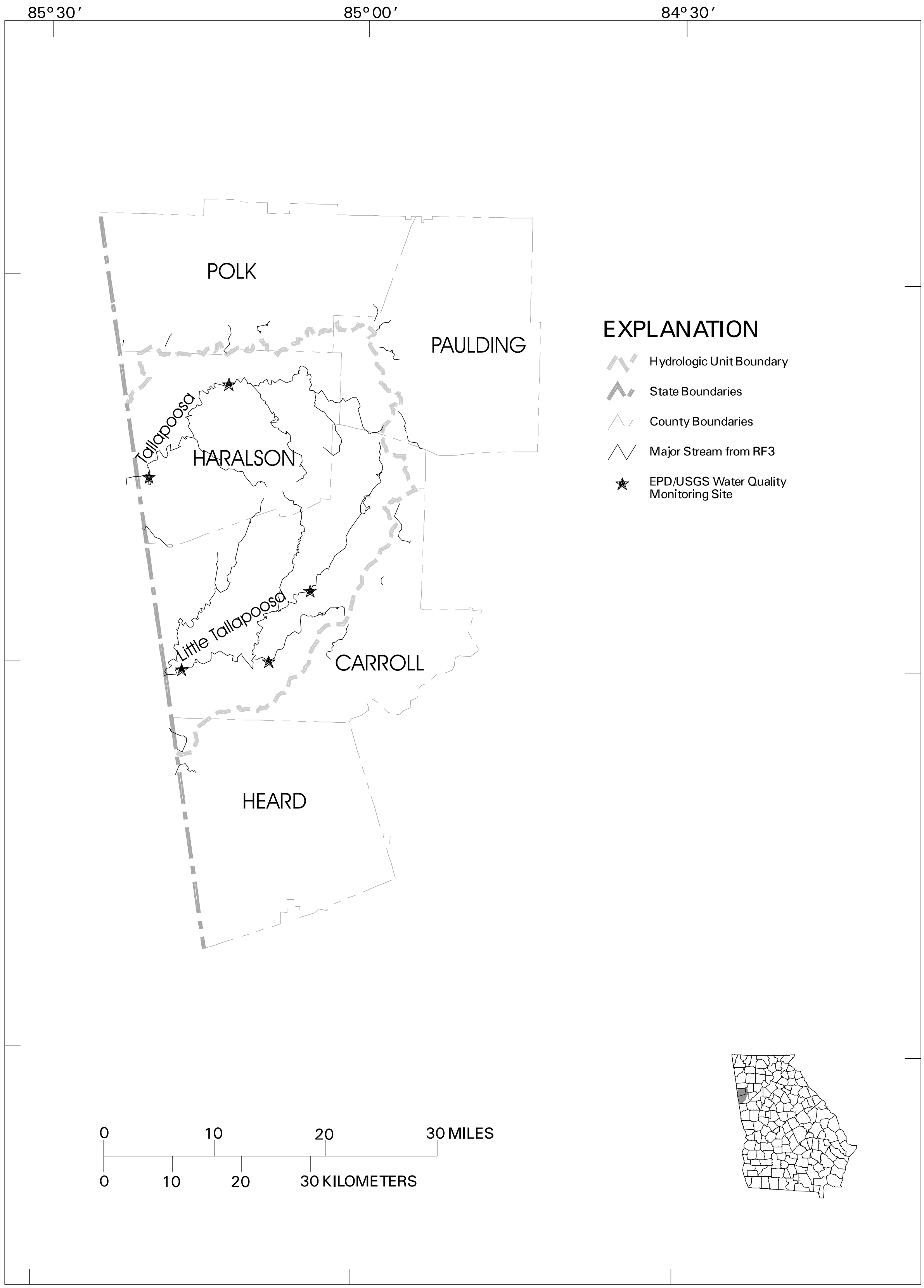


Figure 5-2. Tallapoosa Basin Trend Monitoring Network Station Locations, 1996

Intensive Surveys

Intensive surveys complement long term fixed station monitoring to focus on a particular issue or problem over a shorter period of time. Several basic types of intensive surveys are conducted, including model calibration surveys and impact studies. The purpose of a model calibration survey is to collect data to calibrate a mathematical water quality model. Models are used for wasteload allocations and/or TMDLs and as tools for use in making regulatory decisions. Impact studies are conducted where information on the cause-and-effect relationships between pollutant sources and receiving waters is needed. In many cases biological information is collected along with chemical data for use in assessing environmental impacts.

Fish Tissue Monitoring

The DNR conducts fish tissue monitoring for toxic chemicals and issues fish consumption guidelines as needed to protect human health. It is not possible for the DNR to sample fish from every stream and lake in the state. However, high priority has been placed on the 26 major reservoirs which make up more than 90 percent of the total lake acreage. These lakes will continue to be sampled as part of the River Basin Management Planning 5-year rotating schedule to track trends in fish contaminant levels. The DNR has also made sampling fish in rivers and streams downstream of urban and/or industrial areas a high priority. In addition, DNR will focus attention on areas frequented by a large number of anglers.

The program includes testing of fish tissue samples for the substances listed in Table 5-4. Of the 43 constituents tested, only PCBs, chlordane, and mercury have been found in fish at concentrations that could create risk to human health from fish consumption.

The test results have been used to develop consumption guidelines which are updated annually and provided to fishermen when they purchase fishing licenses. This program will continue and will be coordinated as a part of the River Basin Management Planning process in the future.

Table 5-4. Parameters for Fish Tissue Testing

Antimony	a-BHC	Heptachlor
Arsenic	b-BHC	Heptachlor Epoxide
Beryllium	d-BHC	Toxaphene
Cadmium	g-BHC (Lindane)	PCB-1016
Chromium, Total	Chlordane	PCB-1221
Copper	4,4-DDD	PCB-1232
Lead	4,4-DDE	PCB-1242
Mercury	4,4-DDT	PCB-1248
Nickel	Dieldrin	PCB-1254
Selenium	Endosulfan I	PCB-1260
Silver	Endosulfan II	Methoxychlor
Thallium	Endosulfan Sulfate	HCB
Zinc	Endrin	Mirex
Aldrin	Endrin Aldehyde	Pentachloroanisole
		Chlorpyrifos

Toxic Substance Stream Monitoring

EPD has focused resources on the management and control of toxic substances in the state's waters for many years. Toxic substance analyses have been conducted on samples from selected trend monitoring stations since 1973. Wherever discharges were found to have toxic impacts or to include toxic pollutants, EPD has incorporated specific limitations on toxic pollutants in NPDES discharge permits.

In 1983 EPD intensified toxic substance stream monitoring efforts. This expanded toxic substance stream monitoring project includes facility effluent, stream, sediment, and fish sampling at specific sites downstream of selected industrial and municipal discharges. From 1983 through 1991, 10 to 20 sites per year were sampled as part of this project. During recent years, this effort was reduced significantly due to use of limited laboratory resources for different types of analysis. Future work will be conducted as a part of the River Basin Management Planning process.

Facility Compliance Sampling

In addition to surface water quality monitoring, EPD conducts evaluations and compliance sampling inspections of municipal and industrial water pollution control plants. Compliance sampling inspections include the collection of 24-hour composite samples, as well as an evaluation of the permittee's sampling and flow monitoring requirements.

More than 270 sampling inspections were conducted by EPD staff statewide in 1996-1997. The results were used, in part, to verify the validity of permittee self-monitoring data and as supporting evidence, as applicable, in enforcement actions. Also, sampling inspections can lead to identification of illegal discharges. In 1996, this work was focused on facilities in the Tallapoosa, Coosa, and Oconee River Basins in support of the basin planning process.

Aquatic Toxicity Testing

In 1982 EPD incorporated aquatic toxicity testing into selected industrial NPDES permits. In January 1995, EPD issued approved NPDES Reasonable Potential Procedures, which further delineated required conditions for conducting whole effluent toxicity (WET) testing for municipal and industrial discharges. All major permitted dischargers (flow greater than 1 MGD) are required to have WET tests run with each permit reissuance. Certain minor dischargers are also subject to this requirement if EPD determines that aquatic toxicity is a potential issue.

5.2.3 Data Analysis

Assessment of Use Support

EPA assesses water quality data to determine if water quality standards are met and if the waterbody supports its classified use. If monitoring data shows that standards are not achieved, depending on the frequency with which standards are not met, the waterbody is said to be not supporting or partially supporting the designated use (see box).

Appendix E includes lists of all streams and rivers in the basin for which data have been assessed. The lists include information on the location, data source, designated water use classification, criterion violated, potential cause, actions planned to alleviate the problem, and estimates of stream miles affected. The lists are further coded to indicate status of each waterbody under several sections of the Federal Clean Water Act (CWA). Different sections of the CWA require states to assess water quality (Section

Analysis of data for fecal coliform bacteria, metals, toxicity, dissolved oxygen, fish/shellfish consumption advisories, and biotic data

Fecal Coliform Bacteria

Georgia water quality standards establish a fecal coliform criterion of a geometric mean (four samples collected over a 30 day period) of 200 MPN/100 mL for all waters in Georgia during the recreational season of May through October. This is the year-round standard for waters with the water use classification of recreation. Although the standard is based on a geometric mean, most of the data for Georgia and other states is based on once per month sampling as resources are not available to conduct sampling and analysis four times per month. Thus, for the purposes of this report US EPA recommends the use of a review criterion of 400 MPN/100 mL to evaluate once per month sample results. This density, 400 MPN/100 mL, was used to evaluate data for the months from May through October for all waters. For waters with the water use classification of recreation, this guidance criterion was used to evaluate data for the entire year. For waters classified as drinking water, fishing, or coastal fishing, the maximum Georgia standard for fecal coliform bacteria is 4000 MPN/100 mL (November through April). This standard was used to evaluate data collected during November through April for these waters. Waters were deemed not supporting uses when 25 percent of the samples had fecal coliform bacteria densities greater than the applicable review criteria (400 or 4000 MPN/100 mL) and partially supporting when 11 percent to 25 percent of the samples were in excess of the review criterion.

Metals

Since data on metals from any one given site are typically infrequent, using the general evaluation technique of 25 percent excursion to indicate nonsupport and 11 percent to 25 percent excursion to indicate partial support was not meaningful. Streams were placed in the nonsupporting category if multiple excursions of state criteria occurred and the data were based on more than four samples per year. With less frequent sampling, streams with excursions were placed on the partially supporting list. In addition, an asterisk appears beside metals data in those cases where there is a minimal database. A number of stream segments were listed based on one data point's exceeding a water quality standard. This approach is in accordance with US EPA guidance, which suggests any single excursion of a metals criterion be listed.

Toxicity Testing/Toxic Substances

Data from EPD toxicity testing of water pollution control plant effluents were used to demonstrate or predict toxicity in the receiving waterbody. Based on the effluent toxicity, receiving waters were considered as not supporting when one or more tests gave a clear indication of instream toxicity and as partially supporting when based on predicted instream toxicity. Effluent data for toxic substances were used to designate either partial support or nonsupport based on whether instream corroborating data were available. When instream data were available, the stream was determined to be not supporting; when instream data were not available, the stream was listed as partially supporting.

Dissolved Oxygen, pH, Temperature

When available data indicated that these parameters were out of compliance with state standards more than 25 percent of the time, the waters were evaluated as not supporting the designated use. Between 11 percent and 25 percent noncompliance resulted in a partially supporting evaluation.

Fish/Shellfish Consumption Guidelines

A waterbody was included in the not supporting category when an advisory for "no consumption" of fish, a commercial fishing ban, or a shellfishing ban was in effect. Waterbodies were placed in the partially supporting category if a guideline for restricted consumption of fish had been issued for the waters.

Biotic Data

A "Biota Impacted" designation for "Criterion Violated" indicates that studies showed a modification of the biotic community. Communities used were fish. Studies of fish populations by the DNR Wildlife Resources Division used the Index of Biotic Integrity (IBI) to identify affected fish populations. The IBI values were used to classify the population as Excellent, Good, Fair, Poor, or Very Poor. Stream segments with fish populations rated as "Poor" or "Very Poor" were included in the partially supporting list.

305(b)), to list waters still requiring TMDLs (Section 303(d)), and to document waters with nonpoint source problems (Section 319).

The assessed waters are described in three categories—waters supporting designated uses, waters partially supporting designated uses, and waters not supporting designated uses. Waters were placed on the partially supporting list for at least one of the following reasons:

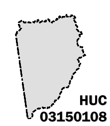
- The chemical data (dissolved oxygen, pH, temperature) indicated an excursion of a water quality standard in 11 percent to 25 percent of the samples collected.
- A fish consumption guideline was in place for the waterbody.

The partially supporting list also includes stream reaches based on predicted concentrations of metals at low stream flow (7Q10 flows) in excess of state standards as opposed to actual measurements on a stream sample. Generally, a stream reach was placed on the not supporting list for at least one of the following reasons:

- The chemical data (dissolved oxygen, pH, temperature) indicated an excursion of a water quality standard in greater than 25 percent of the samples collected.
- A fish consumption ban was in place for the waterbody.
- Acute or chronic toxicity tests documented or predicted toxicity at low stream flow (7Q10) due to a municipal or industrial discharge to the waterbody.

5.2.4 Assessment of Water Quality and Use Support

This section provides a summary of the assessment of water quality and support of designated uses for streams and major lakes in the Tallapoosa River basin. Most of these results were previously summarized in the report *Water Quality in Georgia, 1996-1997* (Georgia DNR, 1998). A geographic summary of assessment results is provided by HUC in Figure 5-3.



Tallapoosa River Basin (Hydrologic Unit Code 03150108)

Appendix E, Table E-1 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998).

Monitoring data were collected from 5 trend monitoring stations located within this subbasin during the 1996 period, two of which were on the Tallapoosa River mainstem and two of which are on the Little Tallapoosa River mainstem. Historically, two trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected primarily by nonpoint source pollution.

Metals

Lead standards were exceeded in the Tallapoosa River mainstem due to nonpoint sources. Lead, copper, cadmium, nickel, zinc and selenium were exceeded in tributary segments due primarily to nonpoint sources and historic sediment contamination associated with the Southwire industrial site. Southwire has two manufacturing facilities, one on each bank of Buffalo Creek. The Copper Division operates a smelter and electrolytic refining process. It now has a contaminated storm water capture and treatment system which supplies the contact cooling water needs. The excess water is treated and discharge to a Buffalo Creek tributary under an NPDES permit. The Southwire Wire Plant takes the copper from the Copper Division and manufactures a

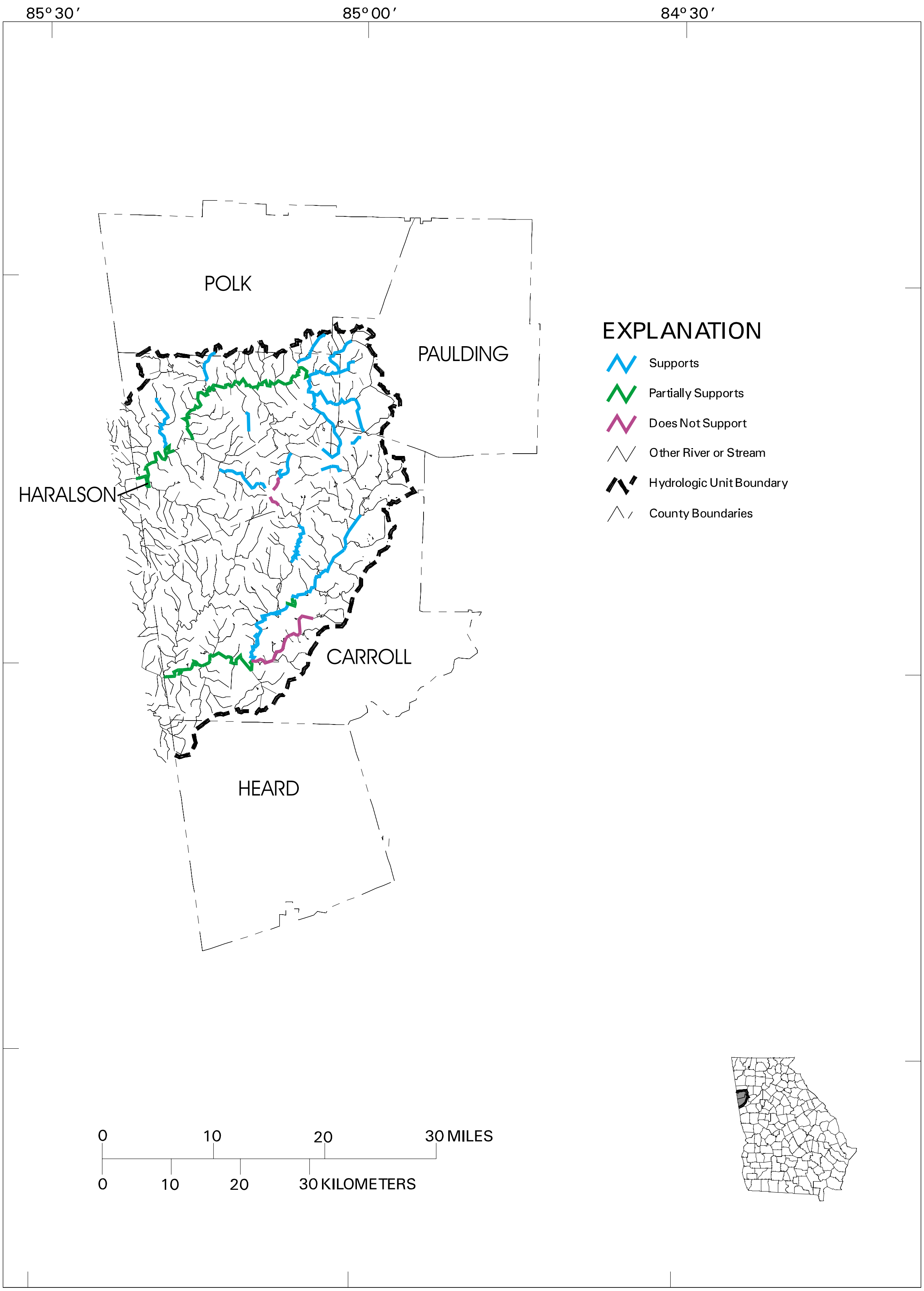


Figure 5-3. Assessment of Water Quality Use Support in the Tallapoosa River Basin, HUC 03150108

variety of wire products. The process wastewater is now recycled as contact cooling water. The excess is pretreated and discharged to the Carrollton sewer system. Storm water drains from the dozens of acres of roofs are connected to the internal process sewer system, which has overflows to Buffalo Creek. These are essentially industrial combined sewer overflows and are limited and monitored under an NPDES permit. These Southwire facilities are net consumers of water; they collect storm water on-site for plant uses and discharge lesser amounts to the streams. Discharges from these two NPDES permitted point sources contribute only a small quantity of metals loading to Buffalo Creek. It is unclear, at this point, how metals concentrations in excess of water quality standards translate into actual risk to or impairment of aquatic life. Initial tests on waters from Buffalo Creek indicate that stream water with metals concentrations in excess of metals standards does not cause toxic effects on sensitive aquatic organisms. Therefore, additional work is needed to determine the actual effect of metals concentrations on aquatic life in the Buffalo Creek watershed.

Bacteria

The standard for fecal coliform bacteria was not met in one Tallapoosa River mainstem segment, one Little Tallapoosa River mainstem segment and three tributary segments. These were attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and animal wastes. This region has a high concentration of poultry operations and spreading of poultry waste on fields may be a potential source.

Erosion and Sedimentation

The water use classification of fishing is potentially threatened in many waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

Guidelines for eating fish from the Tallapoosa River basin are listed in the following tables. The data shown in these tables are the new guidance which was published in the 1998-99 Georgia Sport Fishing Regulations and *1998 Guidelines for Eating Fish from Georgia Waters* booklet. This guidance is based on the EPA risk-based management approach. The guidance is revised each year if new data collected warrant a change. No fish consumption guidelines are currently in effect for the Tallapoosa basin.

Fish Consumption Guidelines–Little Tallapoosa River

Species	Site Tested	Recommendation	Chemical
Largemouth Bass	U.S. Hwy 27	No Restrictions	
Black Crappie	U.S. Hwy 27	No Restrictions	
Brown Bullhead	U.S. Hwy 27	No Restrictions	

Fish Consumption Guidelines–Tallapoosa River

Species	Site Tested	Recommendation	Chemicals
Blacktail Redhorse	U.S. Hwy 27	No Restrictions	
Bluegill Sunfish	U.S. Hwy 27	No Restrictions	

5.2.5 Assessment of Fish and Wildlife Resources

Detailed assessments of fish and wildlife resources in the Tallapoosa River basin were not available at the time of compilation of the basin plan. However, rough, basin-scale assessments of fish and wildlife resources have been developed as part of the RiverCare 2000 Georgia Rivers Assessment (EPD, 1998). These results are summarized below.

Ecologically Important Fish Resources

Georgia's fishery resources depend upon healthy streams and are part of a diverse community of game and nongame species. These communities by definition include vertebrates like fishes and invertebrates like mussels and aquatic insects. A complete community with all species that naturally occurred in a particular river system is irreplaceable. Only a few species can be propagated and restocked into nature. The life found in a Georgia river depends absolutely on the integrity of aquatic habitat, which in turn directly reflects the conditions within the river's entire upstream watersheds. Healthy aquatic ecosystems can provide sustainable commercial and recreational fisheries which are valuable in their own right. The secondary effects often associated with the pursuit of these fisheries adds even more value to Georgia's local economies.

The Georgia Rivers Assessment work group evaluated river segments and associated tributaries according to the composition of fish and mussel species, the quality of habitat, and the characteristics of the particular fishery. The assessment considered chiefly those river corridors lying downstream of the point that the rivers attained an average annual discharge of 400 cfs. However, portions of ecologically-valuable rivers that might have a smaller average annual flow than 400 cfs were also evaluated, including the Tallapoosa River.

The work group established three value classes to rank river segments:

Superior	Non-regulated stream, near wilderness, not immediately influenced by large municipalities, may contain important faunal assemblages
Outstanding	Non-regulated stream with important faunal assemblages or important habitats
Significant	Can include regulated stream reaches with important faunal assemblages or important habitats.

Within the Tallapoosa River basin, 40 river miles were evaluated and rated Superior.

The Tallapoosa River also provides a high-quality, although under-utilized fishery for spotted bass and largemouth bass.

The major threats to ecologically important fish resources come from nonpoint source pollution and the effects of other human activities in the environment. Clearing vegetation, disturbing earth without adequately controlling the movement of sediment, increasing impervious surface, and related activities in a watershed can alter water quality and patterns of stream discharge. Altering river channels, by dredging or by removing snags that furnish many prey organisms for fish, also reduces the quality and quantity of fish habitat. These activities lower the value of streams for fish populations.

Another significant threat to Georgia's fish species is the introduction of exotic (non-native) aquatic species. Many introduced species, such as flathead catfish, compete with native fish for food and cover, take them as food, or parasitize them. If the new species are so successful that they reduce or eliminate the native population, they may significantly reduce the river's fishery biodiversity as well.

Wildlife Resources

Wildlife enriches humans aesthetically and spiritually, can serve as an indicator of environmental health, provides food and pollination services, and may be a source of pharmaceutical chemicals. Predators, such as hawks and foxes, keep in check populations of mice, rats, and other animals that are considered agricultural pests.

Wildlife also provides recreation to the many people who enjoy watching wildlife or hunting. According to recent surveys, 82 percent of Georgians actively observe wildlife or hunt. These activities generate economic activity from the sale of hunting licenses; of equipment and supplies used to identify, hunt, feed, and watch wildlife; and of services such as food, lodging, outdoor guides, and the maintenance and repair of equipment used in wildlife-oriented recreation.

The Georgia Rivers Assessment Wildlife Resources Work Group evaluated wildlife habitat quality, which it defined to include the expected or observed diversity of wildlife species within the river corridor, and the general condition of terrestrial and wetland habitats within the river corridor. The area under consideration included the stream channel and adjoining lands within 3.1 miles of the riverbank. The work group defined high-quality wildlife resource areas as those that provide habitat for a high diversity of wildlife species. These areas may include habitat that has declined significantly or is rare, or that supports species of special conservation concern. The assessment was limited to perennial streams downstream of the point at which the stream reaches an average annual discharge of 400 cfs or greater.

The evaluation criteria placed equal emphasis on four measures of wildlife resource quality, each of which contributed a maximum of 25 points to a river segment's final score:

1. Diversity of species and natural habitats in the river corridor
2. Habitat value for species of special concern
3. Percentage of river corridor in natural vegetation
4. Habitat fragmentation in the river corridor

Segments were rated as Superior (80 to 100 points), Outstanding (61 to 79 points), Significant (41 to 60 points), and Other (less than 41 points). Within the Tallapoosa River Basin 44 miles of river corridor were rated as Significant. No segments were rated as Superior or Outstanding.

The major threats to wildlife resources are a variety of land-use changes, including residential, industrial, silvicultural, and agricultural development. The effects on wildlife resources vary, both quantitatively and qualitatively, depending on the types of land use in a region, the types of natural habitats present, and the amount of development. Changes to native wildlife populations resulting from the conversion of natural forest habitat to short-rotation silvicultural stands are perhaps less obvious than those resulting from conversion to intensive agricultural or industrial use, but are nonetheless significant. Overall, the trends for wildlife habitat quality in Georgia's river corridors include continued fragmentation of natural habitats, loss of forestred riparian buffers, and increasing prevalence of disturbed and early-successional plant and animal communities.

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In This Section

- Identified Basin Planning and Management Concerns
- Priorities for Water Quality Concerns
- Priorities for Water Quantity Concerns

Section 6

Concerns and Priority Issues

The assessments in Section 5 present a number of water quality and quantity concerns within the Tallapoosa River basin. This section aggregates the assessment data to identify priority issues for development of management strategies.

6.1 Identified Basin Planning and Management Concerns

Sections 4 and 5 identified both site-specific and generalized sources of water quality stressors. Some issues are limited to specific segments, but a number of water quality concerns apply throughout the basin. The criterion listed most frequently in *Water Quality in Georgia, 1996-1997* as a contributor to non-supporting or partially-supporting status was fecal coliform bacteria (43 out of 146 miles, or 29 percent of the stream miles assessed within the basin), followed by metals such as zinc, copper, and lead (14 out of 146 miles, or 10 percent of assessed stream miles). Fecal coliform bacteria violations are most often attributed to "urban runoff" as a primary source (22 miles), followed by nonpoint sources (21 miles), while excursions of the metal standards are most often attributed to nonpoint sources (10 miles), followed by contamination from former industrial sources (4 miles). Urban runoff and general nonpoint sources represent a basinwide concern.

Major water quality and quantity concerns for the Tallapoosa River basin are summarized by geographic area in terms of the concerns and sources of these concerns in Table 6-1. Table 6-2 summarizes the pollutants identified as causing impairment of designated uses in the basin; however, not all identified concerns are related to pollutant loads. Ongoing control strategies are expected to result in support of designated uses in a number of waters. In other waters, however, the development of additional nonpoint control strategies might be required to achieve water quality standards.

In the following pages, priority water quality and quantity concerns are presented for the entire Georgia portion of the Tallapoosa River basin, which is encompassed in one Hydrologic Unit. Detailed strategies for addressing these concerns are then supplied in Section 7.

Table 6-1. Summary of Concerns in the Tallapoosa River Basin

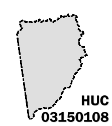
	Source of the Stressor
Stressors of Concern	**Tallapoosa River basin (HUC 03150108)**
Metals	Former industrial discharges, nonpoint sources
Fecal Coliform Bacteria	Urban and rural nonpoint sources
Erosion and Sedimentation	Urban and rural nonpoint sources
Nutrients	Point and nonpoint phosphorus loads
Water Quantity Demand	Competing needs; lack of storage capacity
Source Water Protection for Drinking Water Sources	Surface water sources in need of protection

Table 6-2. Summary of Pollutants Causing Water Quality Impairment in the Tallapoosa River Basin

	Stressor
Use Classification of Waterbody Segments	**Tallapoosa River basin (HUC 03150108)**
Fishing (Support for Aquatic Life)	Metals, toxicity
Fishing (Secondary Contact Recreation)	Fecal coliform bacteria

Each concern is listed in the form of a "Problem Statement" that summarizes the linkage between stressor sources and water quality impacts. The order in which concerns are listed should not be considered to be significant. Prioritization of basin concerns requires consensus among all stakeholders and has not been finalized; however, short-term water quality action priorities for EPD are summarized in Section 6.2. Priorities for addressing water quantity issues within the Tallapoosa basin are being addressed as part of the ACT/ACF study and are summarized in Section 6.3.

6.1.1 Problem Statements



Tallapoosa River Basin (HUC 03150108)

Metals

The water use classification of fishing was not fully supported in one Tallapoosa River mainstem segment, and in two tributary stream segments due to exceedances of the water quality standards for metals. Lead standards were exceeded in the river due to nonpoint sources; lead, copper, cadmium, nickel, zinc, and/or selenium standards were exceeded in Buffalo Creek and a tributary stream due primarily to an industrial site.

Fecal Coliform Bacteria

The water use classification of fishing or drinking water was not fully supported in one Tallapoosa River mainstem segment, one Little Tallapoosa River mainstem segment and 3 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. Four are attributed to urban nonpoint sources, representing a combination of urban runoff, septic systems, sanitary sewer overflows. One is attributed to rural nonpoint sources.

Erosion and Sedimentation

The water use classifications of fishing or drinking water are potentially threatened in water body segments by erosion and loading of sediment, which can alter stream morphology, affect habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, stream erosion (including headcutting, bank erosion, and shifting of the bedload forestry practices, and agriculture. No stream segments in this basin are listed as not fully supporting designated uses due to poor fish communities or sedimentation; however, threats from sediment load are possible throughout the Tallapoosa River basin. A common strategy is proposed for addressing erosion and sedimentation throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Nutrients

The water use classifications of fishing and recreation are potentially threatened in Harris Reservoir due to inputs of nutrients, which might cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

Threatened and Endangered Species

The Tallapoosa basin is home to a number of aquatic species which have been listed as threatened or endangered and require protection (see Table 2-3).

Water Quantity Demand

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate, and recreation uses might not be available within the Tallapoosa River basin (HUC 03150108). In addition, the state of Alabama is concerned about the potential effects of reservoir construction and growth of water use in west Georgia on downstream water flow and availability.

Source Water Protection for Drinking Water Sources

Many public water supplies have no control over their source watersheds and have to spend additional treatment dollars to ensure a high-quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed and implemented.

6.2 Priorities for Water Quality Concerns

6.2.1 Short-Term Water Quality Action Priorities for EPD

Section 6.1 identifies known priority concerns for which management and planning are needed. Because of limited resources and, in some cases, limitations to technical knowledge, not all of these concerns can be addressed at the same level of detail within the current 5-year cycle of basin management. It is therefore necessary to assign action priorities for the short term based on where the greatest return for available effort can be expected.

Current priorities for action by EPD (1998) are summarized in Table 6-3 and discussed below. These reflect EPD's assessment of where the greatest short-term return can be obtained from available resources, but have not yet been refined through consultation with other basin stakeholders. They do not necessarily address all water quality concerns within the current management cycle. These priorities were presented to and discussed with the local advisory committee in February 1998. In addition, the priorities were presented to the public in a stakeholder meeting in Carrollton in February, 1998. The priorities were also public noticed and approved by the USEPA as part of the Georgia CWA 303(d) listing process in 1998. They are discussed in the report *Water Quality in Georgia, 1996-1997.*

Assigning Priorities for Stream Segments

For many waters in the Tallapoosa River basin, currently planned control strategies are expected to result in attainment of designated uses. The majority of EPD resources will be directed to ensure that ongoing pollution control strategies are implemented as planned and water quality improvements are achieved. These waters (see Appendix E) are identified as active 305(b) waters. They are the highest priority waters since these segments will continue to require resources to complete actions and ensure standards are achieved. These stream segments have been assigned priority one (see Table 6-3).

Table 6-3. EPD's Short-Term Priorities for Addressing Waters Not Fully Supporting Use

Priority	Type
1	Segments where ongoing pollution control strategies are expected to result in achieving support of designated uses; active special projects.
2	Segments with multiple data points that have shown metals in excess of water quality standards and segments in which dissolved oxygen is an issue.
3	Waters for which urban runoff and generalized nonpoint sources have resulted in violations of standards for metals or fecal coliform bacteria.

Second priority was allocated to segments with multiple data points that have shown metals concentrations from nonpoint sources in excess of water quality standards and to segments in which dissolved oxygen concentration is an issue (see Table 6-3).

Third priority was assigned to waters where urban runoff and general nonpoint sources have caused metal or fecal coliform bacteria standards violations. Waters added to the Georgia 303(d) list by EPA were also assigned to third priority. Within the current round of basin planning, these sources will be addressed primarily through general strategies of encouraging best management practices for control of stressor loading (see Table 6-3).

Several issues helped forge the rationale for priorities. First, strategies are currently in place to address the significant water quality problems in the Tallapoosa River basin and significant resources will be required to ensure that these actions are completed. Second, the vast majority of waters for which no control strategy is currently in place are listed as impaired as a result of exceedance of criteria for metals or fecal coliform bacteria due to urban runoff or nonpoint sources. At the present time, the viability of the standards for metals and the efficacy of the fecal coliform bacteria standard are in question in the scientific community, as described in Section 4.2. Also, in many cases, the metals database was minimal with as few as one data point showing a concentration in excess of standards placing a stream reach or area of a lake on the partial support lists.

6.2.2 General Long-Term Priorities for Water Quality Concerns

Long-term priorities for water quality management in the Tallapoosa River basin will need to be developed by EPD and all other stakeholders during the next iteration of the basin management cycle. Long-term priorities must seek a balance between a number of different basinwide objectives. These objectives include:

- Protecting water quality in lakes, rivers, and streams through attainment of water quality standards and support for designated uses.
- Providing adequate, high-quality water supply for municipal, agricultural, industrial, and other human activities.

- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems.
- Protecting human health and welfare through prevention of waterborne diseases, minimizing risk from contaminated fish tissue, and reducing risks from flooding.
- Ensuring opportunities for economic growth, development, and recreation in the region.

6.3 Priorities for Water Quantity Concerns

Section 5 also identified a number of concerns for water quantity in the Tallapoosa basin, including existing problems with minimum instream flows and potential future problems for competing demands on water quantity.

6.3.1 Priorities for Competing Demands

With regard to the priority to be placed on meeting competing demands for future water use, EPD (in conjunction with a broad group of stakeholders from north, central, and southwest Georgia) has established a set of "guiding principles" which will be followed in developing the state's position regarding the allocation of water among the states of Alabama, Florida, and Georgia. These principles are partially based upon the prioritization given to meeting categories of water needs under Georgia law (i.e., municipal needs are the first priority, and agricultural water needs are second; all other water needs follow these two). The principles are summarized below:

1. Municipal (M&I) demands have the highest priority.
2. Agriculture needs must be satisfied.
3. Minimum instream flow rates must be met in order to preserve water quality.
4. If other demands (e.g., industry, recreation, hydropower, navigation, and environment) cannot be met under conditions of water shortage, efforts will be made to optimize the mix of economic and environmental values.

Although these "guiding principles" were specifically developed to give expression to Georgia's water needs priorities in those areas of Georgia within the study area of the Alabama-Coosa-Tallapoosa/Appalachicola-Chattahoochee-Flint (ACT/ACF) Comprehensive Study, it is likely that they characterize water needs priorities throughout the state. Thus, Georgia places highest value on the use of water for its citizens to use in drinking and water for agricultural needs. It is also extremely important to address needs for sufficient instream flows to maintain acceptable quality of aquatic habitat.

The Interstate Compact, which has been drafted by the states and Federal government for the ACT basin, does not give the Commission power to determine how Georgia must allocate its share of available water among competing uses; that decision, and the mechanism to implement that allocation, is left to the EPD. Of course, the larger Georgia's share of the available water resource in these basins, the less often any single demand will not be met.

6.3.2 Regional Water Supply Options

In managing Georgia's surface waters, EPD's approach is to meet as many of the identified water needs to the highest extent practicable, while minimizing adverse impacts associated with meeting those needs. Of foremost importance in meeting those needs is maximizing use of already developed water resources along with aggressive water conservation.

Expected population growth in the Tallapoosa basin over the next several decades is likely to result in exhaustion of the water supplies available from already developed sources, even with the employment of very aggressive water conservation measures. New sources will have to be identified and developed. As the population of county and sub-county political jurisdictions in the Tallapoosa River basin continues to expand, the need for water resources is likely to grow beyond the capability of single political jurisdictions to meet demand from the water resources within their political boundaries. Currently there are no regional water sources in the Tallapoosa basin; however, the West Georgia Regional Reservoir project has been proposed. Without additional sources, economic growth may be limited by the capabilities of existing local and regional water resources.

In This Section

- "Big Picture" Overview for the Tallapoosa River Basin
- General Basinwide Management Strategies
- Targeted Management Strategies

Section 7

Implementation Strategies

This section builds on the priority issues identified in Section 6 and proposes strategies to address the major water quality problems in the Tallapoosa River basin.

Georgia's Mission Statement for the river basin management planning is "to develop and implement a river basin planning program to protect, enhance, and restore the waters of the State of Georgia, that will provide for effective monitoring, allocation, use, regulation, and management of water resources." Associated with this mission are a variety of goals that emphasize coordinated planning to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality, habitat, and recreation. For the Tallapoosa basin, these goals will be implemented through a combination of a variety of general strategies, which apply across the basin and across the state, and targeted or site-specific strategies. Sections 7.1 and 7.2 describe the strategy development process and the "big picture" management goals for the Tallapoosa River basin. Section 7.3 describes the general and basinwide implementation strategies of most relevance to the Tallapoosa River Basin Management Plan. Targeted strategies for specific priority concerns within each subbasin, as identified in Section 6, are then presented in Section 7.3.

7.1 "Big Picture" Overview for the Tallapoosa River Basin

This Tallapoosa River basin Management Plan includes strategies to address a number of different basinwide objectives. These include

- Protecting water quality in lakes, rivers and streams through attainment of water quality standards and support for designated uses.
- Providing adequate, high-quality water supply for municipal, agricultural, industrial, and other human activities.
- Preserving habitat suitable for the support of healthy aquatic and riparian ecosystems.

- Protecting human health and welfare through prevention of water borne disease; minimizing risk from contaminated fish tissue, and reducing risks from flooding.
- Ensuring opportunities for economic growth, development, and recreation in the region.

Achieving these objectives is the responsibility of a variety of state and federal agencies, local governments, business, industry, and individual citizens. Coordination between partners is difficult, and impacts of actions in one locale by one partner on conditions elsewhere in the basin are not always understood or considered. River Basin Management Planning (RBMP) is an attempt to bring together stakeholders in the basin to increase coordination and to provide a mechanism for communication and consideration of actions on a broad scale to support water resource objectives for the entire basin. RBMP provides the framework to begin to understand the consequences of local decisions on basinwide water resources.

RBMP, begun in 1993, is changing the way EPD and other state agencies do business. At the same time, local government comprehensive planning requirements require a higher degree of effort and awareness by local governments to address resource protection and planning for the future.

This plan presents general broad-scale goals and strategies for addressing the most significant existing and future water quality and quantity issues within the Tallapoosa basin. The basin plan provides a whole-basin framework for appropriate local initiatives and controls, but cannot specify all the individual local efforts which will be required. The basin plan will, however, provide a context and general management goals for the local-scale plans needed to address local-scale nonpoint loads in detail. EPD expects local governments and agencies to take the initiative to develop local strategies consistent with the basin-scale strategies presented in this plan.

A number of concerns identified in this plan will affect planning and decision-making by local governments, state agencies, and business interests. Detailed strategies for addressing identified concerns are presented in Section 7.4. This section provides an overview of the key “big picture” issues and planning opportunities in the Tallapoosa River basin.

7.1.1 Water Quality Overview

As discussed in Section 5, water quality in the Tallapoosa River basin is generally good at this time, although problems remain to be addressed and proactive planning is needed to protect water quality into the future. Many actions have already been taken to protect water quality. Programs implemented by federal, state, and local governments, farmers, foresters, and other individuals have greatly helped to protect and improve water quality in the basin over the past twenty years. Streams are no longer dominated by untreated or partially treated sewage or industrial discharges, which resulted in impaired aquatic life. For the most part, local government and industrial wastewaters are properly treated, and fish populations are have returned.

The primary source of pollution that continues to affect waters of the Tallapoosa River basin results from nonpoint sources. Key types of nonpoint source pollution impairing or threatening water quality in the Tallapoosa River basin include erosion and sedimentation, bacteria from urban and rural nonpoint sources, metals from urban and rural sources, and excess nutrient loads. These problems result from the cumulative effect of the activities of many individual landowners or managers. Population is growing every year, increasing the potential risks from nonpoint sources. Growth is essential to the economic health of the Tallapoosa River basin, yet growth without proper land use planning and implementation of best management practices to protect streams and rivers can create harmful impacts on the environment.

Because there are so many small sources of nonpoint loading spread throughout the watershed, nonpoint sources of pollution cannot effectively be controlled by state agency permitting and enforcement, even where regulatory authority exists. Rather, control of nonpoint loading will require the cooperative efforts of many partners, including state and federal agencies, individual landowners, agricultural and forestry interests, local county and municipal governments, and Regional Development Centers. A combination of regulatory and voluntary land management practices will be necessary to maintain and improve the water quality of rivers, streams, and lakes in the Tallapoosa River basin.

Key Actions by EPD

The Georgia EPD's Water Protection Branch has responsibility for the establishing of water quality standards, water quality monitoring, river basin planning, water quality modeling, permitting and enforcement of point source NPDES permits, and development of total maximum daily loads (TMDLs) where ongoing actions are not sufficient to achieve water quality standards. Much of this work is regulatory. EPD is also one of several agencies responsible for facilitating, planning, and educating the public about management of nonpoint source pollution. Nonpoint source programs implemented by Georgia and by other states across the nation are voluntary in nature. The Georgia EPD Water Resources Branch regulates the use of Georgia's surface and ground water resources for municipal and agricultural uses, which includes source water assessment and protection activities in compliance with the Safe Drinking Water Act.

Actions being taken by EPD at the state level to address water quality problems in the Tallapoosa River Basin include the following:

- **Watershed Assessments and Watershed Protection Implementation Plans**. When local governments propose to expand an existing wastewater facility, or propose a new facility with a design flow greater than 0.5 million gallons per day, EPD requires a comprehensive watershed assessment and development of a watershed protection implementation plan. The watershed assessment includes monitoring and assessment of current water quality and land use in the watershed and evaluation of the impacts of future land use changes. A watershed protection implementation plan includes specific strategies such as land use plans and local actions designed to ensure that existing problems are being addressed and that future development will be conducted in a way to prevent water quality standards violations.
- **Total Maximum Daily Loads**. Where water quality sampling has documented standards violations and ongoing actions are not sufficient to achieve water quality standards in a 2-year period, a TMDL will be established for a specific pollutant on the specific stream segment in accordance with EPA guidance. The TMDL will specify the allowable loading of a pollutant from both point and nonpoint sources. EPD will implement TMDLs through a watershed approach using a combination of regulatory and nonregulatory tools.
- **Source Water Protection**. Most of the public water supply in the Tallapoosa basin is drawn from surface water. To provide for the protection of public water supplies, Georgia EPD is developing a Source Water Assessment Program in alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding recent EPA initiatives. This new initiative is expected to result in assessments of threats to drinking water supplies and, ultimately, local Source Water Protection Plans. Recent "Criteria for Watershed Protection" (a subsection of the Rules for Environmental Planning Criteria) produced by the

Department of Community Affairs set minimum guidelines for protection of watersheds above "governmentally owned" water supply intakes.

Key Actions by Resource Management Agencies

Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide nonregulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs.

Agriculture in the Tallapoosa River basin is primarily restricted to livestock and poultry operations. About 21 percent of the basin land areas is in agricultural use. Key partners for controlling agricultural nonpoint source pollution are the Soil and Water Conservation Districts, the Georgia Soil and Water Conservation Commission, and the USDA Natural Resources Conservation Service. These partners promote the use of environmentally sound best management practices (BMPs) through education, demonstration projects, and financial assistance. In addition to incentive payments and cost-sharing for BMPs, three major conservation programs from USDA will be available to producers and rural landowners. These are the Conservation Reserve Program, which protects highly erodible and environmentally sensitive land; the Wetland Reserve Program, designed to protect, restore, and enhance wetlands with cost-share incentives; and the Wildlife Habitat Incentives Program, which will help landowners develop and improve wildlife habitat.

Forestry is a major part of the economy in the Tallapoosa basin, and commercial forest lands represent about 70 percent of the total basin land area. The Georgia Forestry Commission (GFC) is the lead agency for controlling silvicultural nonpoint source pollution. The GFC develops forestry practice guidelines, encourages BMP implementation, conducts education, investigates and mediates complaints involving forestry operations, and conducts BMP compliance surveys. Recently, the State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of foresters involved in unresolved complaints where the lack of BMP implementation has resulted in water quality violations.

Key Actions by Local Governments

Addressing water quality problems resulting from nonpoint source pollution will primarily depend on actions taken at the local level. Particularly for nonpoint sources associated with urban and residential development, it is only at the local level that regulatory authority exists for zoning and land use planning, control of erosion and sedimentation from construction activities, and regulation of septic systems.

Local governments are increasingly focusing on water resources issues. In many cases, the existence of high-quality water has not been recognized and managed as an economic resource by local governments. That situation is now changing due to a variety of factors, including increased public awareness; high levels of population growth in many areas, resulting in a need for comprehensive planning; recognition that high-quality water supplies are limited; and new state-level actions and requirements. The latter include:

- Requirements for Watershed Assessments and Watershed Protection Implementation Plans when permits for expanded or new municipal wastewater discharges are requested.
- Development of Source Water Protection Plans to protect public drinking water supplies.

- Requirements for local comprehensive planning, including protection of natural and water resources, as promulgated by the Georgia Department of Community Affairs.

It is the responsibility of local governments to implement planning for future development that takes into account management and protection of the water quality of rivers, streams, and lakes within their jurisdiction. One of the most important actions local governments should take to ensure recognition of local needs while protecting water resources is to participate in the basin planning process, either directly or through Regional Development Centers.

7.1.2 Water Quantity Overview

In addition to protecting water quality, it is essential to plan for water supply in the Tallapoosa River basin. The Georgia EPD's Water Resources Branch regulates the use of Georgia's surface and ground water resources for municipal and agricultural uses and is responsible for ensuring sufficient instream flows are available during a critical drought condition to meet permitted withdrawal requirements without significant impact on the environment. The withdrawal permit process must not overuse the available resources. The Water Resources Branch is also responsible for regulation of public water systems for compliance with the Safe Drinking Water Act, as well as regulation of dams for compliance with the Safe Dams Act.

Water quantity concerns in the Tallapoosa River Basin are driven by the extreme low flows that have occurred during past droughts. Public water supplies in the basin are dependent on surface water, but basin characteristics create a situation in which drought flows may be very low. Water supply in the Tallapoosa basin will not be sufficient in the long term (year 2020 and beyond) to meet expected municipal/industrial and agricultural water demands unless water is either imported from another basin or additional storage is provided.

The West Georgia Regional Water Authority is leading the effort to develop a proposed major regional reservoir project in the Tallapoosa Basin. This proposed reservoir could supply water to Haralson, Carroll, Paulding, Douglas and Polk counties. While the proposed project would be built in the Tallapoosa basin, it could potentially provide water to portions of the Coosa, Tallapoosa and Chattahoochee basins.

Although interbasin diversions are not prohibited within Georgia, the Rules for Water Quality Control do require EPD to proceed in the following manner before making decisions regarding such transfers:

1. Give due consideration to existing competing uses that might be affected by such transfers.
2. Issue a press release that describes the proposed transfer.
3. If the public interest expressed in reaction to the press release is sufficient to warrant a public hearing, hold a hearing to receive comments on the proposed transfer prior to making a final decision.

ACT/ACF Allocations

Water quantity within the Tallapoosa basin is also subject to interstate agreements. In 1990 the state of Alabama, concerned about the availability of water for its future needs, filed suit in U.S. District Court to prevent the Corps of Engineers (USACE) from reallocating water from Lakes Lanier, Carters, and Allatoona to increase the water supply for metropolitan Atlanta; Florida later joined this suit. Under a letter of agreement signed by the three states and the Corps, the ACT/ACF (Alabama- Tallapoosa-

Tallapoosa/Apalachicola-Chattahoochee-Flint) Comprehensive Study was initiated in 1991. In 1997, the three state legislatures approved separate interstate compacts that establish the legal and functional basis for future management of the ACT and ACF basins. The President signed the compacts on November 20, 1997.

The compacts require that water allocations be developed before the end of 1998. Obviously, the allocation for the ACT basin will have a potentially significant effect on water resource planning in the Tallapoosa basin in Georgia. It is expected that the allocation will establish some form of a commitment for Georgia to allow certain quantities of water to pass downstream for use by Alabama. Such a commitment will not establish how the water may be used within Georgia; those decisions will remain the prerogative of Georgia's governments and citizens. It is possible, however, that there might be limitations on quantities of water available for various uses in the Tallapoosa basin.

In cases where there is competition for water across water use categories (i.e., water held in lakes for recreation vs. withdrawals for potable uses), Georgia law requires that priority be given to water for human consumption. However, it is far more likely that the competition for scarce water will not be across water use categories so much as between adjoining jurisdictions. In such instances, EPD currently does (and will continue to) encourage cooperative efforts to develop and effectively use limited water resources. Although cooperative intergovernmental approaches are much preferred in addressing such competition, the fact that the Director of EPD has the statutory authority to make final decisions regarding water withdrawal applications means that EPD will assist in resolving such matters if other efforts fail.

7.2 General Basinwide Management Strategies

Many statewide programs and strategies play an important role in the maintenance and protection of water quality in the Tallapoosa basin. These general strategies are applicable throughout the basin to address both point and nonpoint sources.

7.2.1 General Surface Water Protection Strategies

Antidegradation

The state of Georgia considers all waters of the state as high-quality waters and applies a stringent level of protection for each waterbody. Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6-03(2)(b), contains specific antidegradation provisions as follows:

> (b) Those waters in the State whose existing quality is better than the minimum levels established in standards on the date standards become effective will be maintained at high quality; with the State having the power to authorize new developments, when it has been affirmatively demonstrated to the State that a change is justifiable to provide necessary social or economic development and provided further that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. All requirements in the Federal Regulations, 40 CFR 131.12, will be achieved before lowering of water quality is allowed for high-quality water.

The antidegradation review process is triggered when a new or expanded point source discharge that might have some effect on surface water quality is proposed. Such proposals are reviewed to determine if the new discharge is justifiable to provide necessary social or economic development and that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses.

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a “no-discharge” land application or urban reuse alternative. The application for discharge to surface waters will be considered only if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use must be maintained and protected.

Water Supply Watershed Protection Strategy

As population continues to increase within the Tallapoosa River basin, it will become ever more important to protect the water quality of already developed raw water sources. EPD is acting in concert with the Department of Community Affairs to produce a set of “guidelines” that define, among other things, measures local governments are encouraged to take to protect drinking water sources. The “guidelines” are entitled Rules for Environmental Planning Criteria, and they establish environmental protection criteria for five environmental categories—water supply watersheds, ground water recharge areas, mountains, river corridors, and wetlands. The Criteria for Watershed Protection (a subsection of the Rules for Environmental Planning Criteria) set minimum guidelines for protection of watersheds above “governmentally owned” water supply intakes. The degree of protection depends on the size of the watershed; watersheds with drainage areas of less than 100 square miles are subject to more strict criteria, as summarized below:

- Impervious surface densities limited to 25 percent over the entire watershed.
- Buffer/setback requirements equal to 100/150 feet within a 7-mile radius of the intake and 50/75 feet outside the 7-mile radius.
- A reservoir management plan (including a 150-foot buffer around the perimeter of the reservoir).

Watersheds with drainage areas of 100 square miles or more are subject to less strict criteria, as summarized below:

- An intake on a flowing stream (as opposed to being located within a reservoir) will have no specified minimum criteria.
- An intake with a water supply reservoir will have a minimum of 100 feet natural buffer within a 7-mile radius of the reservoir, and no impervious cover constructed within a 150-foot setback area on both banks of the stream.

EPD is also actively working toward meeting the national goal that, by the year 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs (SWPP) in place under both wellhead protection and watershed protection programs. EPD intends to accomplish this goal by developing and implementing a source water assessment program (SWAP) in alignment with EPA’s initiatives.

Although the procedures and strategies of the new program are incomplete to date, the Drinking Water Program will compile a statewide source water assessment plan soliciting input from the public and approval from EPA. The plan will specify how the state will delineate areas providing source waters for public water systems, identify origins of contaminants in delineated areas, determine the susceptibility of public water sources to the contaminants, and provide the basis for local individual source water protection plans for each different public water system. Once the statewide plan is approved, the DWP will be allowed the flexibility to help complete the local source water protection plans for contracted public water systems and provide financial and technical assistance to help develop long-range source water protection strategies for the public water system. The source water assessment program will build on EPD's other assessment and prevention programs, including the Well Head Protection Program and the Vulnerability Assessment and Waiver Program, by soliciting active public participation from the local communities and will assist in the preparation of the local water system's protection plan.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act (CWA) establishes the TMDL process as a tool to implement water quality standards. Georgia is required by the CWA to identify and list waterbodies where water quality standards are not met following the application of technology based controls, and to establish TMDLs for the listed stream segments. The USEPA is required to approve or disapprove Georgia's 303(d) list of waters and TMDLs.

The most recent requirement for 303(d) list submittal occurred in 1998. Georgia submitted a draft 303(d) list to EPA in February 1998. EPA reviewed the Georgia submittal and provided comments in March 1998. Georgia submitted a final 303(d) listing to EPA on April 1, 1998.

Georgia's 1998 303(d) listing is based on the Georgia 305(b) water quality assessments. The 305(b) assessment is presented in the report *Water Quality in Georgia, 1996-1997*. The 305(b) assessment tables are reprinted in Appendix E of this report. The tables provide a code indicating the 303(d) listing status of assessed segments within the Tallapoosa River basin. An explanation of the codes is given below. An "X" in the 303(d) column indicates the segment is on the Georgia 303(d) list.

1 Segments identified as not supporting or partially supporting designated uses where actions have been taken and compliance with water quality standards achieved. These segments are not part of the Georgia 303(d) list.

2 Segments identified as not supporting or partially supporting designated uses where existing enforceable state, local, or federal requirements are expected to lead to attainment of water quality standards without additional control strategies. These segments are not part of the Georgia 303(d) list.

3 Segments where TMDLs were completed and approved by EPA in 1998.

X Waters with active 303(d) status. These segments are assessed as not supporting or partially supporting designated uses and might require additional controls to achieve designated uses. These segments make up the Georgia 303(d) list.

NA Waters assessed as supporting designated uses.

Georgia will address a number of the listed waters in the 1999-2000 time period; however, the majority of work on segments in the Tallapoosa River will be addressed in the second round of basin planning. The second round of basin planning will begin in 2000, and the Coosa River will be the focus of monitoring in the year 2001. Significant efforts will be made to assess the condition of the listed 303(d) waters at that time, and results of the assessments will dictate the areas where TMDLs will be developed. TMDLs will be publicly noticed for appropriate segments in June 2003.

7.2.2 Management of Permitted Point Sources

The strategies in this section strive to minimize adverse effects from municipal, industrial, and concentrated storm water discharges. Permitted discharges of treated wastewater are managed through the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES permit program provides a basis for regulating municipal and industrial discharges, monitoring compliance with effluent limitations, and initiating appropriate enforcement action for violations. EPD has formulated general strategies for a number of types of environmental stressors under the NPDES program.

Analysis of Alternatives

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no discharge," land application, or urban reuse alternative. The application for discharge to surface waters will be considered only if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use must be maintained and protected.

Permit Issuance/Reissuance Strategies

During the basin plan implementation phase, issues identified in the written basin plan pertaining to point source discharges will be assessed. The assessment will include such things as (1) identified point source discharge problem areas, (2) data evaluations, (3) wasteload allocations and/or TMDLs with identified problem point sources, and (4) toxics identified with point source discharges. Permits associated with identified problems will be evaluated to determine whether a reopening of the permit is appropriate to adequately address the problem.

Watershed Assessment Requirements

A watershed assessment is typically initiated when, due to growth and development, a local government sees a need to increase the hydraulic capacity of an existing wastewater treatment facility (or propose a new facility) and contacts the EPD for and NPDES permit modification. If an antidegradation review demonstrates that it is not feasible to handle the additional capacity needs with a land treatment or other no discharge system, the community may pursue an increase in its surface water discharge. The initial step in this process is the completion of a watershed assessment, which is the first step toward ensuring that all water quality standards will be maintained throughout a watershed during both critical dry and wet weather conditions in response to both point and nonpoint source loads.

The watershed assessment is actually a study, an assessment, and a plan. It is about collecting data and learning relationships between what is going on in a watershed and how these activities (land uses, etc.) affect water quality, then using this knowledge to develop both short- and long-term plans designed to ensure the attainment of water quality standards. The assessment should address current conditions and consider projected land use changes. Only when it can be demonstrated that water quality standards are and will continue to be maintained can EPD develop a wasteload allocation and prepare a defensible permit for a proposed new wastewater treatment facility or proposed hydraulic expansion of an existing wastewater treatment facility discharging to the watershed. The assessment should include a detailed plan to address both current water quality and biological problems and any predicted future water quality and biological problems. Key components of such a plan will likely be adopted by EPD as "special conditions" of the pertinent new or modified NPDES permit.

Facility Construction/Improvements

EPD has promoted continuing improvement in the quality of return flows from permitted point sources in the basin. Upgrading wastewater treatment facilities is a significant strategy to meet effluent limits from discharges. In the past 10 years, various upgrades and improvements have been made to industrial and municipal treatment systems throughout the Tallapoosa River basin. The funding for these projects has come from state and federal construction grants and the citizens of local municipalities. Appendix C provides detailed information on expenditures by city and county governments on upgrading wastewater treatment facilities in the basin.

Domestic Wastewater Systems

The collecting, treating and disposing of wastewater in Georgia is regulated by a number of environmental laws administered by various agencies in local and state government. When a local government or private concern (owner) identifies a need for a wastewater treatment and disposal system, it is imperative that thorough and adequate planning take place.

Wastewater systems that discharge treated wastewater to a surface stream must be permitted through the federal NPDES program and meet all the NPDES requirements. In Georgia, with very few exceptions, surface discharge permits will be issued only to publicly owned systems.

Wastewater systems that do not result in a discharge to surface waters, such as slow rate land treatment systems and urban reuse systems (no discharge), are permitted through the state of Georgia's land application system (LAS) permitting process. Both publicly and privately owned systems can apply for and receive LAS permits.

Chlorine

If a chlorine limit is not already required in an NPDES permit, all major municipal wastewater facilities (i.e., those with design flows greater than or equal to 1.0 million gallons per day [MGD]) are required to meet a chronic toxicity-based chlorine limitation when the permit comes up for routine reissuance. The limitation is calculated based on a maximum instream concentration of 0.011 mg/L, the facility's design flow, and the 7Q10 low flow of the receiving stream. No facilities are given a limitation higher than 0.5 mg/L since this is deemed to be an operationally achievable number even if a facility does not have dechlorination equipment installed. Facilities that are given a limitation more stringent than 0.5 mg/L and do not already have dechlorination equipment installed are given up to a 2-year schedule in which to meet the limitation. All discharging facilities that are upgrading are required to meet a chlorine limitation as part of the upgrade, based on the same criteria noted above.

Ammonia

Ammonia in effluents poses a problem both as a source of toxicity to aquatic life and as an oxygen-demanding waste. New facilities and facilities proposed for upgrade are required to meet ammonia limits for toxicity if those limits are more stringent than instream dissolved-oxygen-based limits. Existing facilities are not required to meet ammonia limits based on calculated toxicity unless instream toxicity has been identified through toxicity testing.

Metals/Priority Pollutants

Major municipal and industrial facilities are required to submit periodic priority pollutant scans to EPD as part of their permit monitoring requirements or upon submittal of a permit application for permit reissuance. The priority pollutant data are assessed in accordance with the Georgia Rules and Regulations for Water Quality Control. The results of the assessment can be used to trigger additional priority pollutant monitoring, a toxicity reduction evaluation, or permit limits for certain parameters.

Color

The state's narrative water quality standard for color requires that all waters must be free from material related to discharges that produce color which interferes with legitimate water uses. EPD's color strategy will address this standard for industrial and municipal discharges by implementing permit limits and/or color removal requirements. EPD requires new facilities or discharges to prevent any noticeable color effect on the receiving stream. EPD requires existing facilities with color in their effluent to collect upstream and downstream color samples when their NPDES permit is reissued. The facility must conduct an assessment of the sources of color. Also, a color removal evaluation may be required at permit reissuance. EPD will also target facilities for color removal requirements based on significant citizen complaints of discoloration in streams.

Phosphorus

EPD establishes phosphorus control strategies where needed to address water bodies where water quality is limited by excess phosphorus loading. Point source control of phosphorus typically involves stringent limits on phosphorus concentrations in municipal NPDES facility effluents. At this time, there are no major reservoirs in the Tallapoosa River basin with water quality standards for phosphorus.

Temperature

Permits issued for facilities that discharge to primary trout streams are required to have no elevation of natural stream temperatures. Permits issued for facilities that discharge to secondary trout streams are required to not elevate the receiving stream more than 2 degrees Fahrenheit.

Storm Water Permitting

The 1987 Amendments to the federal Clean Water Act require permits to be issued for certain types of storm water discharges, with primary focus on storm water runoff from industrial operations and large urban areas. EPA promulgated Storm Water Regulations on November 16, 1990. EPD subsequently received delegation from EPA in January 1991 to issue General Permits and regulate storm water in Georgia. EPD has developed and implemented a storm water strategy that ensures compliance with the federal regulations.

The “Phase I” federal regulations set specific application submittal requirements for large (population 250,000 or more) and medium (population 100,000 to 250,000) municipal separate storm sewer systems. Accordingly, Georgia has issued individual area wide NPDES municipal separate storm sewer system (MS4) permits to 58 cities and counties in municipal areas with populations greater than 100,000 persons. These permits authorize the municipalities to discharge storm water from the MS4s they own or operate and incorporate detailed storm water management programs. These programs may include such measures as structural and nonstructural controls, best management practices, inspections, enforcement, and public education efforts. Storm water management ordinances, erosion and sediment control ordinances, development regulations and other local regulations, provide the necessary legal authority to implement the storm water management programs. Illicit discharge detection and long-term wet weather sampling plans are also included in the management programs. The permit requires the submission of Annual Reports to EPD, describing the implementation of the storm water management program. Among other things, the Annual Report includes a detailed description of the municipality's implementation of its Storm Water Management Plan.

EPA's Phase I Storm water Rule addresses only municipalities with populations of more than 100,000 people and construction sites larger than 5 acres. EPA is proposing a Phase II Storm water Rule for municipalities with populations of fewer than 100,000 people and construction sites smaller than five acres. This rule is not expected to be finalized until at least March 1999. The Phase II rule will eventually affect some of the municipalities within the basin.

EPD has issued one general permit regulating storm water discharges for 10 of 11 federally regulated industrial subcategories defined in the Phase I federal regulations. The 11th subcategory, construction activities, will be covered under a separate general permit, which is not yet finalized. The general permit for industrial activities requires the submission of a Notice of Intent (NOI) for coverage under the general permit, the preparation and implementation of a storm water pollution prevention plan, and, in some cases, the monitoring of storm water discharges from the facility. As with the municipal storm water permits, implementation of site-specific best management practices is the preferred method for controlling storm water runoff.

7.2.3 Nonpoint Source Management

The strategies in this section address sources of environmental stressors that are not subject to NPDES permitting and typically originate from diffuse or nonpoint sources associated with land uses. Most strategies that address nonpoint source concerns are not regulatory in nature, but involve a variety of approaches such as technical assistance and education to prevent and reduce nonpoint source pollution in the basin. Strong stakeholder involvement will be essential to effectively implement many of these strategies.

Georgia Nonpoint Source Management Program

EPD has produced the *Georgia Nonpoint Source Management Program (PFY98-02)*, which provides an overview of the state's nonpoint source water quality management activities, as well as a summary of what the State intends to accomplish in the next five federal fiscal years. The *Georgia Nonpoint Source Management Plan* addresses the following categories of nonpoint source pollution: Agriculture (crops, pasture, animal operations, aquaculture), Silviculture, Construction, Urban Runoff, Resource Extraction/Exploration/ Development, Land Disposal (Runoff/Leachate from Permitted Areas), Hydrologic/Habitat Modification, and Other.

Agricultural Nonpoint Source Control Strategies

Agricultural nonpoint source pollution continues to be managed and controlled with a statewide nonregulatory approach. This approach uses cooperative partnerships with various agencies and a variety of programs. Brief descriptions of these agencies and their functions and programs are provided below.

Soil and Water Conservation Districts

Georgia's SWCDs were formed by Act No. 339 of the Georgia General Assembly on March 26, 1937. Their role is to provide leadership in the protection, conservation, and improvement of Georgia's soil, water, and related resources. This is accomplished through promotion efforts related to the voluntary adoption of agricultural BMPs.

Currently there are 40 active SWCDs in Georgia. The entire Tallapoosa River basin in Georgia falls within the West Georgia Soil and Water Conservation District. At the county level, each SWCD receives technical assistance, through an existing Memorandum of Agreement, from the U.S. Department of Agriculture's Natural Resources Conservation Service to work with landowners on implementing agricultural BMPs. Through these partnerships applying a voluntary approach to conservation, 15 million acres have received conservation treatment in Georgia.

Georgia Soil and Water Conservation Commission (GSWCC)

Georgia's SWCDs receive no annual appropriations and are not regulatory or enforcement agencies. Therefore, the Georgia Soil and Water Conservation Commission (GSWCC) was also formed in 1937 to support the SWCDs. GSWCC has been designated as the administering or lead agency for agricultural nonpoint source pollution prevention in the state. The GSWCC develops nonpoint source water quality programs and conducts educational activities to promote conservation and protection of land and water resources devoted to agricultural uses. Primary functions of the GSWCC are to provide guidance and assistance to the Soil and Water Conservation Districts and to provide education and oversight for the Georgia Erosion and Sedimentation Act.

A number of other agricultural agencies administer programs to address water quality and natural resource management issues. Resource Conservation and Development (RC&D) Councils are organized groups of local citizens, supported by USDA, involved in a program to encourage economic development, as well as the wise conservation of natural and human resources. The University of Georgia College of Agricultural and Environmental Sciences (CAES) conducts an education and outreach campaign that encourages producers to increase productivity using environmentally sound techniques. This is accomplished through a number of programs like Farm*A*Syst, well water testing, nutrient management, soil and water laboratory analysis, and informational material on a wide range of subjects. The Georgia Department of Agriculture (GDA) administers a wide variety of insect and plant disease control programs to help regulate the use of pesticides. GDA also inspects irrigation system requirements, such as check valves and back flow prevention devices, for protection of ground water. The Agricultural Research Service (ARS) conducts research designed to improve the effectiveness of agricultural conservation techniques and promote sustainability. The Natural Resources Conservation Service (NRCS), along with the Farm Services Agency (FSA) and through local Soil and Water Conservation Districts, administers Farm Bill Programs that provide technical and financial incentives to producers to implement agricultural BMPs. The Agricultural Water Use Coordinating Committee, through its individual members, regularly applies for and receives funds under section 319(h) of the Clean Water Act to fund best management practices and demonstration projects throughout the state. The Georgia Soil and Water Conservation Commission has provided state leadership with many of these efforts.

Collectively, these programs will address resource concerns related to agricultural land uses in a coordinated fashion over the next 5 years until the second iteration of the River Basin Management Planning Cycle. Much of the information regarding opportunities to participate under this voluntary approach to complying with water quality standards is disseminated through commodity commissions and organizations such as the Farm Bureau Federation, Agribusiness Council, Cattlemen's Association, Milk Producers

Association, Pork Producers Association, Poultry Federation, and other agricultural support industries.

Prioritization Activities Under the Farm Bill

The 1996 Farm Bill provides a number of programs and processes designed to address those environmental stressors related to nonpoint sources from Agriculture which were identified in section 4.1.2. A new flagship conservation program, the Environmental Quality Incentives Program (EQIP), will provide the lion's share of funding for technical, educational, and financial assistance. The USDA's Natural Resources Conservation Service (NRCS) has leadership for EQIP and works with the USDA Farm Service Agency (FSA) to set policies, priorities, and guidelines. These two agencies take recommendations from local work groups and a State Technical Committee, composed of resource professionals from a variety of disciplines, when addressing actual and potential resource impairments associated with agricultural land uses.

EQIP provides incentive payments and cost-sharing for conservation practices through 5 to 10 year contracts. Producers may receive federal cost-sharing up to 75 percent of the average cost of certain conservation practices such as terraces, grassed waterways, filter strips, buffer strips, manure management facilities, animal waste utilization, and 46 other conservation practices important to improving and maintaining the health of natural resources in an area. An individual producer can receive as much a $50,000 in EQIP funds to implement needed conservation practices.

A majority of funds allocated to Georgia (65 percent) will be spent in priority areas where there are serious and critical environmental needs and concerns. High priority is given to areas where state and local governments offer financial and technical assistance, and where agricultural improvements will help meet water quality and other environmental objectives. During the 1998 federal fiscal year, Georgia has 18 priority areas, none of which are located in the Tallapoosa River basin.

The remaining 35 percent of funds allocated to Georgia can be extended outside priority areas to other parts of the state. Eligibility is limited to persons who are engaged in agricultural productions. Eligible land includes cropland, pastureland, forestland, and other farm lands.

In addition to EQIP three major conservation programs from USDA will be available to producers and rural landowners. The first is the Conservation Reserve Program (CRP), which protects highly erodible and environmentally sensitive land with grass, trees, and other long-term cover. The Wetland Reserve Program (WRP) is a voluntary program designed to protect, restore, and enhance wetlands with cost-share incentives. The Wildlife Habitat Incentives Program (WHIP) will help landowners develop and improve habitats for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife.

Forestry Nonpoint Source Control Strategies

In 1977, the Governor's Silviculture Task Force prepared a report that recommended a voluntary approach to the implementation of BMPs and the designation of the Georgia Forestry Commission (GFC) as the lead agency for implementing the silviculture portion of the state Section 208 Water Quality Management Plan. The GFC was designated as the lead agency for silvicultural nonpoint source pollution prevention in the state in November 1979. The Forestry Nonpoint Source Control Program is managed and implemented by the GFC, with the support of the forest industry, for the voluntary implementation of BMPs.

The Forestry Nonpoint Source Control Program is managed by a Statewide Coordinator and appointed foresters serving as District Coordinators from each of the 12 GFC districts. The Statewide and District Coordinators conduct educational workshops, training programs, and field demonstrations for the forest community (i.e., landowners, land management and procurement foresters, consulting foresters, timber buyers, loggers, and site preparation contractors). The GFC investigates and mediates complaints involving forestry operations. In addition, the GFC conducts BMP compliance surveys to assess the effectiveness of BMPs in the forest community. The GFC has established procedures for installing water control structures in firebreaks to reduce soil erosion and sedimentation.

Recently, the State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of professional foresters involved in unresolved complaints where the lack of BMP implementation has resulted in violations of state water quality or federal wetlands requirements.

Urban Nonpoint Source Control Strategies

The 1990 report of the Community Stream Management Task Force, *We All Live Downstream*, established a road map for urban nonpoint source management in Georgia. The Task Force recognized two major impediments to effectively managing the quality of urban waterbodies. The first is the division between statutory responsibilities for management of water quality, (granted to EPD) and local government's constitutional responsibility for management of the land activities that affect urban waterbodies. The second impediment is the widespread nature of the nonpoint sources and the variety of activities that can contribute to impacts from urban runoff. They concluded that management of urban nonpoint source pollution would require ". . . a cooperative partnership between layers of government, the private sector, and the general public. The development of such a partnership will require a strong impetus to accept new institutional roles and make the structural changes necessary to support and sustain the stream management process."

EPD has a primary role in facilitating the management of urban runoff, and it is responsible for administering and enforcing a variety of permit programs, including permitting of storm water discharges. In addition to these regulatory activities, EPD seeks to assist in development of local solutions to water quality problems; provides technical information on the water resources of the state; and administers grant programs, with funds from various sources, to support nonpoint source planning and assessment, implementation of BMPs, and regional or local watershed management initiatives. EPD also conducts a variety of outreach and educational activities addressing urban runoff in general, regulatory requirements, and cooperative or nonregulatory approaches.

For urban runoff, activities of the Nonpoint Source Management Program interact strongly with point source controls for combined sewers and storm sewers, both of which discharge urban runoff through point conveyances. While the state continues to have an important regulatory role, aspects of the cooperative intergovernmental partnerships envisioned by the Task Force have emerged and are being strengthened. EPD is implementing programs that go beyond traditional regulation, providing the regulated community with greater flexibility and responsibility for determining management practices. Current activities for urban surface runoff control include the following:

- Implementing local nonpoint source management programs, streambank and stream restoration activities, and community Adopt-A-Stream programs.
- Developing and disseminating local watershed planning and management procedures.

- Implementing state and local erosion and sedimentation control programs.
- Preparing and disseminating technical information on best management practices and nonpoint source monitoring and assessment.
- Implementing nonpoint source education programs for kindergarten through grade 12 through Project WET (Water Education for Teachers), as described below in Section 7.2.6.
- Implementing the Georgia Adopt-A-Stream Program, as described in Section 7.2.6.
- Identifying and evaluating resources to support urban watershed planning and management.

7.2.4 Floodplain Management

Floodplain Management Strategies

Floodplain Management in the state of Georgia is administered under federal regulations and local ordinances. The federal statutes are in Title 44 of the *Code of Federal Regulations,* Parts 59 to 79. As a condition of participation in the National Flood Insurance Program (NFIP), local political jurisdictions voluntarily adopt Flood Damage Prevention Ordinances, which are based on federal regulations, to enforce and administer floodplain development. Georgia's Floodplain Management Office does not issue permits for floodplain development.

Georgia's Floodplain Management Office, located within the Department of Natural Resources, Environmental Protection Division, serves as liaison between the Federal Emergency Management Agency (FEMA) and local communities participating in the NFIP. However, Georgia's Floodplain Management Office has no regulatory authority. Participation by the local communities in the NFIP is a requirement for the federal government to make flood insurance available to all property owners. Through workshops, newsletters, technical assistance and community visits, the Floodplain Management Office assists local governments in maintaining compliance with NFIP requirements. The Floodplain Management Office also provides technical data, floodplain maps, and training workshops to various public and private entities involved in floodplain management and floodplain determinations. In addition, the Floodplain Management Office reviews all state-funded and federally funded projects for development in designated Special Flood Hazard Areas. A major thrust of the Floodplain Management Office is to increase the number of political jurisdictions participating in the NFIP, thereby increasing the number of flood-insured structures in Georgia.

River Care 2000 Program

Georgia also has strategies to protect and manage riparian floodplain areas. Of particular relevance is River Care 2000, a conservation program that Governor Zell Miller established in September 1995. One key objective of this program is acquisition of river-corridor lands for purposes of protection and to forestall unwise development in flood-prone areas. The Coordinating Committee has approved procedures for three types of projects—Riverway Demonstration Projects, which improve public access to a river with scenic and recreation uses and protect natural and historic resources by acquiring and managing land in the river corridor; Significant Sites, the which are tracts of land the Department of Natural Resources (DNR) will acquire and operate as traditional state public-use facilities—such as wildlife management or public fishing areas, parks or historic sites, natural areas, and greenways; and Restoration Sites, which are tracts of land the state will identify, acquire, and manage to reduce nonpoint source water pollution.

The River Care 2000 program is also charged with assessing important river resources throughout the state and identifying more effective management tools for river corridors. The program recently released a statewide assessment of resources associated with rivers throughout the state (GA DNR, 1998).

7.2.5 Wetland Management Strategies

The loss of wetlands, because of the associated adverse impacts on flood control, water quality, aquatic wildlife habitat, rare and endangered species habitat, aesthetics, and recreational benefits, has become an issue of increasing concern to the general public as people become better informed of the values and functions of wetlands. Georgia still suffers from the lack of accurate assessments for current and historic wetland acreage, but, regardless of the method used to measure total acreage or wetland losses, Georgia still retains the highest percentage of precolonial wetland acreage of any southeastern state.

Efforts to Track No Net Loss of Wetlands

Although the 1993 Federal Administration Wetlands Plan calls for a concerted effort by EPA and other federal agencies to work cooperatively toward achieving no overall net loss of wetlands in the short term and a net increase in the quantity of the nation's wetlands in the long run, there have been no statutory or executive-level directives to carry out this policy. Achievement of the goal of no net loss is dependent on limited changes to regulations, memoranda of understanding, cooperative agreements, and other partnerships between federal, state, and local governments, conservation organizations, and private citizens.

All dredge and fill activities in freshwater wetlands are regulated in Georgia by the U.S. Army Corps of Engineers (USACE) under section 404 of the Clean Water Act. The majority of wetland alterations occur under nationwide or general permits, which include permits for bridge building, minor road crossing fills, and fills of less than 10 acres above the “headwaters” point of nontidal streams where the annual average flow is less than 5 cubic feet per second. Enforcement is carried out by the USACE and EPA in freshwater wetlands. Normal agricultural and silvicultural operations are exempted under section 404 regulations.

The USACE may require wetland mitigation activities in association with permitting, including creation, restoration, and protection of wetlands. The USACE may also require wetland restoration in the case of violations. In the settlement of violations, restorations occurred on 16.8 acres in 1994 and 17.8 acres in 1995.

Land Acquisition

DNR’s, Wildlife Resources Division (WRD), began a land acquisition program in 1987 to acquire 60,000 acres of additional lands for Wildlife Management Areas (WMAs) and Public Fishing Areas (PFAs). This initiative was funded by $30 million of 20-year obligation bonds to be paid off by hunting and fishing license increases and WMA permit fees.

In 1990 Governor Miller initiated Preservation 2000, a $60 million program to acquire 100,000 acres of lands to be used for wildlife and fisheries management, parks and recreation, natural area preservation, and general conservation. Additional wetlands acquisition occurs as part of the River Care 2000 initiative, discussed above.

7.2.6 Stakeholder Involvement and Stewardship Strategies

Effective nonpoint source management must address the numerous activities of individuals, businesses, industries, and governments that can adversely affect urban and rural waters. In many cases, these groups are unaware of the potential impacts of their activities or corrective actions that could be taken. Stakeholder involvement and stewardship are essential to address these major challenges.

Georgia has chosen a two-pronged approach to encourage stewardship through education and citizen monitoring. EPD is the lead agency in these education and citizen monitoring programs, but, like other aspects of the state's nonpoint source management effort, cooperative efforts with local governments and community-based groups are critical to their implementation. Outreach and education, including citizen monitoring, lay the groundwork for behavioral change and are often important prerequisites for effective implementation of BMPs and comprehensive watershed management programs.

General goals for stakeholder involvement and stewardship strategies are as follows:

- Generate local support for nonpoint source management through public involvement and through monitoring of streams and other waterbodies and of results of management actions.
- Increase individuals' awareness of how they contribute to nonpoint source pollution problems and implement appropriate strategies to motivate behavioral change and actions to address those problems.
- Provide the educational tools, assistance, and support for addressing NPS problems to target audiences across the state.

Georgia Adopt-A-Stream

The Georgia Adopt-A-Stream Program is designed to promote citizen monitoring and stream protection. Currently, more than 5,000 volunteers participate in individual- and community-sponsored Adopt-A-Stream Programs. Volunteers conduct cleanups, stabilize streambanks, monitor streams using biological and chemical methods, and evaluate habitats and watersheds. These activities lead to a greater awareness of water quality and nonpoint source pollution, active cooperation between the public and local governments in protecting water resources, and the collection of basic water quality data. The Georgia Adopt-A-Stream Program focuses on what individuals and communities can do to protect Georgia's water resources from nonpoint source pollution. The program offers training and support in the following activities: watershed surveys, visual surveys, biological monitoring, chemical testing, and cleanups.

The Georgia Adopt-A-Stream Program addresses nonpoint source pollution from agriculture, silviculture, construction, and urban runoff. The focus of the Adopt-A-Stream Programs in middle and southern Georgia is often agricultural nonpoint source pollution (especially where land use is largely agricultural crop production). Examples of such pollution (e.g., excess fertilizer and animal waste) are presented in workshops, videos, and manuals. Adopt-A-Stream Programs in urban areas address nonpoint source pollution from construction and urban runoff. Workshops and training sessions emphasize the connection between land use, storm water runoff, and water resources. Erosion and sedimentation control at construction sites is always a major concern with volunteers.

Volunteers are offered three levels of involvement. Each level involves education and an action component on a local stream. Volunteers commit for a minimum of a year on a half-mile stream segment. Level I consists of setting up a project (i.e., identifying a stream segment, identifying partners, registering with the Georgia Adopt-A-Stream Program), evaluating land use and stream conditions during a "watershed walk," conducting quarterly visual evaluations and cleanups, and participating in one public outreach activity. Volunteers create a "Who to Call for Questions or Problems" list so that if something unusual is noted, immediate professional attention can be obtained. Level II builds on Level I by adding biological monitoring, chemical monitoring or a habitat improvement project. Level III includes two or more Level II activities.

Approximately 500 volunteers participate in the various workshops each year. "Introduction to Adopt-A-Stream Program" and "Watershed Walk" videos have been produced, duplicated, and distributed on loan. The Georgia Adopt-A-Stream Program Manuals have been printed and distributed to approximately 1,000 volunteers. In addition, a bimonthly newsletter is published and distributed to over 1,000 volunteers. The Annual Georgia Adopt-A-Stream Conference and Awards Ceremony is held each fall. The Georgia Adopt-A-Stream Program assists EPD in organizing the Annual Georgia River Clean-Up Week each fall, with more than 1,000 volunteers cleaning up river segments in over 50 locations. In addition, the Georgia Adopt-A-Stream Program conducts numerous presentations around the state.

As of January 1998, no Adopt-A-Stream organizations had been formed within the Tallapoosa River basin.

Nonpoint Source Education: Project WET (Water Education for Teachers)

A report outlining a plan for nonpoint source education in Georgia was completed in 1994. Titled Georgia Urban Waterbody Education Plan and Program, the report laid out nonpoint education strategies for seven target audiences—general public, environmental interest organizations, civic associations, educators, business associations, local government officials, and state government officials. Given limited resources and the scope of effort required to target each of these audiences concurrently, EPD decided to initially target nonpoint source education efforts toward educators and students in grades K to 12. To reach this target audience, EPD has focused on implementing Project WET, a water resources education curriculum that focuses on nonpoint source pollution. Covering impacts on ground water and surface water, the curriculum addresses the following nonpoint sources: agriculture, forestry, urban, and construction. It is recognized nationally and internationally and is readily adaptable to fit the state's Quality Core Curriculum requirements. To date, nonpoint source concerns have not received significant emphasis in water resources education efforts in Georgia. Implementation of Project WET is addressing this gap, providing educators and students with an understanding of the problems caused by nonpoint source pollution and the tools that can be used to prevent, control, or abate nonpoint source impacts.

EPD began implementing Project WET in December 1996. In 1997 Project WET Facilitator Training Workshops were successfully completed in Alpharetta, Macon, and Savannah, Georgia. Currently there are 86 Project WET Facilitators in Georgia.

In 1997, 32 Project WET Educator Workshops were successfully completed in Georgia statewide, with more than 500 educators receiving certified Project WET training and implementing the Project WET curriculum in classrooms. In addition to Project WET Facilitator Training and Educator Workshops, 40 Project WET Demonstration Workshops were presented to teachers and environmental educators throughout Georgia. A newsletter is published and distributed quarterly with program updates, workshop schedules, information about available resources, reports about classroom activities, and success stories. After 3 years, it is expected that a cooperating agency will assume responsibility for ongoing Project WET activities. At that time, the focus of the state's NPS education activities will be reevaluated and, depending on the focus of education efforts undertaken by other entities, another of the audiences identified in the 1994 education plan might be targeted.

7.2.7 Ground Water Protection Strategies

In 1984, EPD developed its first management plan to guide the management and protection of Georgia's ground water quantity and quality. The current version, Georgia Geologic Survey Circular 11, published in 1996, is the basis of Georgia's application to be certified by USEPA for a Comprehensive State Ground Water Protection Plan (CSGWPP). The goal of Georgia's ground water management plan is

> . . . to protect human health and environmental health by preventing and mitigating significant ground water pollution. To do this, Georgia will assess, protect, and, where practical, enhance the quality of ground waters to levels necessary for current and projected future uses for public health and significant ecological systems.

The goal recognizes that not all ground water is of the same value. The Division's goal is primarily preventive, rather than curative, but it recognizes that nearly all ground water in the state is usable for drinking water purposes and should remain so. EPD pursues this goal through a policy of antidegradation by which ground water resources are prevented from deteriorating significantly, preserving them for present and future generations. Selection of this goal means that aquifers are protected to varying degrees according to their value and vulnerability, as well as their existing quality, current use, and potential for future use.

EPD has adequate legal authority to prevent ground water from being significantly polluted and to cleanup ground water in the unlikely event pollution occurs. Extensive monitoring has shown that incidents of ground water pollution or contamination are uncommon in Georgia; no part of the population is known to be at risk.

In general, the prevention of ground water pollution includes (1) the proper siting, construction, and operation of environmental facilities and activities through a permitting system; (2) implementation of environmental planning criteria by incorporation into land use planning by local government; (3) implementation of a Wellhead Protection Program for municipal drinking water wells; (4) detection and mitigation of existing problems; (5) development of other protective standards, as appropriate, where permits are not required; and (6) education of the public to the consequences of ground water contamination and the need for ground water protection.

Ground water pollution is prevented in Georgia through various regulatory programs (administered by DNR) that regulate the proper siting, construction, and operation of the following:

- Public water supply wells, large irrigation wells and industrial wells withdrawing more than 100,000 gallons per day.
- Injection wells of all types.
- Oil and gas wells (including oil and gas production).
- Solid waste handling facilities.
- Hazardous waste treatment, storage, disposal facilities.
- Municipal and industrial land treatment facilities for waste and wastewater sludge.
- Municipal and industrial discharges to rivers and streams.

- Storage, concentration, or burial of radioactive wastes.
- Underground storage tanks.

EPD prevents the contamination of ground water used for municipal drinking water through an EPA-approved Wellhead Protection Program. As a result of this program, certain new potentially polluting facilities or operations are restricted from wellhead protection areas or are subject to higher standards of operation or construction. EPD also encourages local governments to adhere to the Criteria for the Protection of Groundwater Recharge Areas (a section of the Rules for Environmental Planning Criteria), which define higher standards for facility siting, operation, and cleanup in significant ground water recharge areas. The most stringent guidelines of these criteria pertain to those recharge areas with above-average ground water pollution susceptibility indexes.

Moreover, EPD has legal authority under the Georgia Water Quality Control Act to clean up ground water pollution incidents. Additional clean-up authority occurs as special trust funds established to clean up leaking underground storage tanks, abandoned hazardous waste sites, and scrap tire dumps.

Most laws providing for protection and management of ground water are administered by EPD. Laws regulating pesticides are administered by the Department of Agriculture; environmental planning, the Department of Community Affairs; and on-site sewage disposal, the Department of Human Resources. EPD has established formal Memoranda of Understanding with these agencies. The Georgia Groundwater Protection Coordinating Committee was established in 1992 to coordinate ground water management activities between the various departments of state government and the several branches of EPD.

7.3 Targeted Management Strategies

This section describes specific management strategies targeted to address the concerns and priority issues for the Tallapoosa River basin that were described in Section 6. Strategies are presented for each issue of concern with divisions by geographic area as appropriate. For each of the concerns identified, the management strategy statement consists of five components—a problem statement (identical to that given in Section 6), general goals, ongoing efforts, identified gaps and needs, and strategies for action. The purpose of these statements is to provide a starting point for key participants in the subbasin to work together and implement strategies to address each priority concern. In some cases, a strategy might simply consist of increased monitoring; in other situations, the stakeholders in the subbasin will need to develop innovative solutions to these water quality issues. Although EPD will continue to provide technical oversight, conduct monitoring surveys, and evaluate data on a basinwide scale, locally led efforts in the subbasins will be required to help to monitor, assess, restore, and maintain the water quality throughout the Tallapoosa River basin.

7.3.1 Metals

Problem Statement

The water use classification of fishing was not fully supported in one Tallapoosa River mainstem segment, and in 2 tributary stream segments due to exceedances of the water quality standards for metals. Lead standards were exceeded in the river due to nonpoint sources; lead, copper, cadmium, nickel, zinc and/or selenium were exceeded in Buffalo Creek and a tributary stream due primarily to an industrial site.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

Historic discharges from Southwire Company, and associated contamination of stream sediments, are attributed as a cause of violations of standards in Buffalo Creek watershed. Early in 1997 Southwire initiated a watershed modeling effort for the Buffalo Creek watershed to help identify and quantify nonpoint source loadings in the watershed. During 1998 Southwire is collecting calibration data for the model to ensure it provides an accurate reflection of stream flow quantity and quality. The model will be an effective tool for evaluating potential nonpoint source management options and Best Management Practices to ensure the most effective options are implemented. This focused effort will help ensure that public and private resources are allocated to the most beneficial projects, and that proposed strategies contribute to the goal of providing a healthy environment for aquatic life.

In 1997 Southwire also began research on a Storm Water Capture and Control project for the Copper Division of Southwire (CDS) facility. The objective of the proposed project is to minimize the metals transported off the site by storm water. Currently, except for periods of extremely high rainfall, all storm water from the central 23 acre basin at the facility is captured, treated, and utilized as plant process water. Most manufacturing and materials handling operations occur in this central basin.

Under the proposed project, storm water from the central basin and from another 26 acres of the site would be captured, treated, and reused. Any discharged water would be treated to remove metals. Available technology will be pilot tested to determine the most feasible and effective water treatment technology. The initial cost for the proposed project is estimated to be $15,000,000. If the research indicates this proposed project is feasible, implementation of the project will be a significant step towards improving water quality in streams leading from the site and overall aquatic health in the watershed.

Identified Gaps and Needs

The EPD is concerned with the accuracy of stream assessments showing criteria violations for metals because in many cases the metals database was minimal, with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data since it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce data of ensured quality. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine whether water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals might need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring might be appropriate to measure impacts along with concentrations of metals.

For Buffalo Creek, it is unclear, at this point, how metals concentrations in excess of water quality standards translate into actual risk to or impairment of aquatic life. Initial tests on waters from Buffalo Creek indicate that stream water with metals concentrations in excess of metals standards does not cause toxic effects on sensitive aquatic organisms. Therefore, additional work is needed to determine the actual effect of metals concentrations on aquatic life in the Buffalo Creek watershed. In the past the State

University of West Georgia has collected aquatic life data for Buffalo Creek. An effort will be made to compile this data to look for trends and determine if impairment to aquatic life has in fact been observed.

The sources of metals contamination in the Buffalo Creek watershed are diverse and not yet fully identified. The ongoing watershed modeling effort undertaken by Southwire will assist in quantifying metals contributions from the various sub-basins so that additional sampling efforts can be focused in these areas. As sources are identified through sampling, potential management options for minimizing their impact on water quality will be evaluated using the model.

Strategies for Action

Addressing metals loading from nonpoint sources will be a complex task, requiring a strong local component and assistance from all stakeholders. An initial task in all impacted segments will be to conduct additional monitoring to determine whether water quality standards are actually being exceeded. For Buffalo Creek, a watershed modeling and nonpoint source management option evaluation process has been initiated by Southwire and will be developed as a tool to help identify opportunities to meet water quality goals.

Key Participants and Roles

- EPD will monitor and assess use support in listed waters, continue to enforce point source compliance with metal limits through the NPDES permitting program, and conduct additional monitoring to document metals concentrations in segments affected by nonpoint sources of metals.
- Southwire will develop and apply the watershed model for the Buffalo Creek basin, evaluate nonpoint source management options, and maintain NPDES discharge permit compliance.
- Local governments will develop and implement storm water management strategies.
- The State University of West Georgia will assist with biota studies and monitoring programs for Buffalo Creek.
- Other participants would be identified contingent on further analysis to confirm metal concentrations and on identification of potential sources.

Specific Management Objectives

Employ watershed modeling and additional data collection to determine effective approaches to maintaining a healthy environment for aquatic life. Overview ongoing efforts by Southwire to complete cleanup efforts.

Management Option Evaluation

EPD will take the lead in conducting additional monitoring to confirm that water quality standards are being exceeded. If violations are documented, EPD will develop a plan to assess sources and identify alternative solutions. For Buffalo Creek, watershed modeling will be utilized to identify and quantify nonpoint sources and to evaluate options.

Action Plan

- Southwire will continue to develop the Buffalo Creek watershed model and use the model to identify and quantify non-point sources and evaluate management options.
- Southwire will initiate work on the Storm Water Capture and Control project for the CDS facility.
- Southwire will continue to ensure that its permitted point sources remain in compliance with permitted effluent limitations for metals.
- EPD and Southwire will continue to sample in targeted areas to help pinpoint nonpoint sources of metal loading in the Buffalo Creek watershed. These efforts should be complete by December 2001, in accordance with the RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2001, in accordance with the statewide RBMP management cycle.
- EPD will continue to administer the storm water regulations and will encourage local planning to address storm water management.
- EPD will continue to develop Rapid Bioassessment Protocol capabilities designed to assess impairment of aquatic life.
- Local governments may opt to develop a Storm Water Management Plan to address the urban runoff concerns.
- The basin team will reevaluate stream status and management strategies during the next basin cycle, scheduled for 2002.

Methods for Tracking Performance

Review of site cleanup progress and assessment of status of streams as new data are collected. An evaluation of the status of listed water bodies will be made coincident with the next iteration of the RBMP management cycle for the Tallapoosa basin in 2002.

7.3.2 Fecal Coliform Bacteria

Problem Statement

The water use classifications fishing or drinking water was not fully supported in one Tallapoosa River mainstem segment, one Little Tallapoosa River mainstem segment and 3 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. Four are attributed to urban nonpoint sources, representing a combination of urban runoff, septic systems, sanitary sewer overflows. One is attributed to rural nonpoint sources.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

The primary source of exceedance of water quality standards for fecal coliform bacteria in the Tallapoosa River basin is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows might also contribute to the problem.

Agriculture is making progress in controlling bacterial loads. Considerable effort has been directed toward animal confinement areas. Georgia universities and agricultural agencies or groups are conducting several agricultural efforts with statewide implementation. Sustainable Agriculture and Farm*A*Syst. Training will be scheduled in the near future within the basin. The UGA and ARS have submitted proposals for assessing nutrient- and coliform-reducing BMPs on 10 farms, which will have statewide implications. Soil and Water Conservation Districts annually convene Local Work Groups, composed of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their areas. These Local Work Groups develop proposals for USDA or other funding to address identified resource concerns.

NRCS, in cooperation with other agencies, is working with local landowners to implement agricultural best management practices with cost-sharing funds under PL-566. The project is referred to locally as the Lower Little Tallapoosa River Watershed Project. There have been local efforts to expand this project to include the entire Little Tallapoosa River Watershed.

The ongoing Lower Little Tallapoosa River Watershed Project is addressing agricultural animal waste as is the Section 319 Special BMP Demonstration Project in Carroll County. In addition, EPA and NRCS, in cooperation with the agricultural community in Georgia, are conducting field inventories to verify agricultural contributions to water quality impairments on streams for which a TMDL has been established.

Identified Gaps and Needs

Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal bacterial loads might be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods might be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows could be a source of fecal coliform. In addition, previous sampling was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle might be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine whether water quality standards are actually being exceeded.

Many coliform-reducing practices are expensive, and the percentage of reduction is often unknown. Many landowners are reluctant to spend today's dollars for long-term amortization in uncertain futures markets. Agricultural BMPs and cost-share dollars (Farm Bill and section 319 funds) and loans need to be concentrated in priority watersheds with a sufficient technical workforce to implement enough BMPs through long-term agreements or contracts to reduce sediment loading by 70 to 80 percent.

Strategies for Action

Separate strategies are needed to address nonpoint fecal coliform bacteria loadings from urban and rural sources.

A. Strategies for Urban Sources

Addressing urban runoff will be a complex task and will require implementation of watershed pollution control programs by local governments. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this 5 year phase of the basin management cycle, management will concentrate on source control and planning. The efficacy of this approach will be evaluated during the basin strategy reevaluation scheduled for October 2001 to September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles

- EPD will monitor and assess use support in listed stream segments and will encourage local efforts to address nonpoint source pollution.
- Local governments will continue to operate and maintain their sewer systems and wastewater treatment plants; monitor land application systems; and develop and implement storm water regulations, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local municipalities should work with local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.
- Citizen groups will implement Adopt-A-Stream programs and work with local governments in implementing watershed initiatives.

Specific Management Objectives

Facilitate local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation

Integrated management options will be proposed, implemented, and evaluated by local governments.

Action Plan

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will continue to administer the storm water program and encourage local planning to address storm water management.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.

- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses. Sampling will be completed by December 2001, in accordance with the statewide RBMP management cycle.

Method for Tracking Performance

EPD tracks point source discharges through inspections and evaluations of self-monitoring data. The status of listed waterbodies will be evaluated coincident with the next iteration of the RBMP management cycle for the Tallapoosa River basin in 2002.

B. Strategies for Rural Sources

Agricultural cost-share dollars (Farm Bill and section 319 funds) and loans need to be concentrated in priority watersheds with sufficient technical workforce to implement enough BMPs through long-term agreements or contracts.

Key Participants and Roles

- EPD will monitor and assess use support in listed streams, encourage local planning efforts, and regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D Councils, with assistance from NRCS, will promote implementation of agricultural management practices. Local SWCDs will convene Local Work Groups to identify local resource concerns and develop proposals for funding to address these concerns.
- Citizen groups will implement Adopt-A-Stream programs and will work with local governments in implementing watershed initiatives.
- Local municipalities should work with local health departments to identify locations of septic systems and educate owners about proper care and maintenance of septic systems.

Specific Management Objectives

Encourage and facilitate local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation

Evaluation will be consulted on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan

- EPD will continue to ensure that all permitted point source discharges remain in compliance with fecal coliform bacteria limits.
- EPD will continue monitoring and assessment of Land Application Systems.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling and will follow up on complaints related to coliform bacteria derived from agriculture. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill will be

targeted to areas of apparent water quality impact, including rural streams, which may sustain excessive fecal coliform loads from animal and cropland operations.

- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality. DHR will also use the criteria presented in the Growth Planning Act for septic system setbacks from high-value waters.

Method for Tracking Performance

Agricultural agencies will track rates of BMP implementation for cropland and animal operations. The status of listed waterbodies will be evaluated coincident with the next iteration of the RBMP management cycle for the Tallapoosa River basin in 2002.

7.3.3 Erosion and Sedimentation

Problem Statement

Water use classifications for fishing or drinking water are potentially threatened in many waterbody segments by erosion and loading of sediment, which can alter stream morphology, affect habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. At the present time there are no stream segments listed in this basin as not fully supporting designated uses due to poor fish communities or sedimentation; however, threats from sediment load are possible throughout the Tallapoosa River basin. A common strategy is proposed for addressing erosion and sedimentation throughout the basin; however, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

General Goals

Control erosion and sedimentation from land-disturbing activities to meet narrative turbidity water quality standards and support designated uses.

Ongoing Efforts

Forestry and agriculture have voluntary erosion and sediment control (E&SC) programs built around implementation of BMPs. Both forestry and agriculture have a water quality complaint resolution procedure in place. GSWCC recently updated and is distributing *Manual for Erosion and Sediment Control in Georgia* and the *Field Manual for Erosion and Sediment Control in Georgia*. The GSWCC and its agricultural partners have produced and distributed three E&SC pamphlets— *Guidelines for Streambank Restoration*, *A Guide to Controlling Erosion with Vegetation*, and *Agricultural Best Management Practices*. These and numerous other E&SC-related pamphlets and other informational materials are available in agricultural offices throughout the state. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs), composed of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their area. These LWGs develop proposals for USDA or other funding to address identified resource concerns.

GSWCC estimates that there are 95,000 agricultural acres within the Basin and that 10,200 of those acres are eroding above the soil loss tolerance.

NRCS, in cooperation with other agencies, is working with local landowners to implement agricultural best management practices with cost-sharing funds under PL-566. The project is referred to locally as the Lower Little Tallapoosa River Watershed Project. There have been local efforts to expand this project to include the entire Little Tallapoosa River Watershed. Also the West Georgia Soil and Water Conservation District chairs the Georgia Association of Conservation Districts Water Resources Committee and has a special interest in the Tallapoosa basin.

Forestry has made significant E&SC progress. GFC has been and is specifically targeting those landowner groups and regions with low compliance for increased BMP education through local talks, workshops, and demonstrations, including the Master Timber Harvesters Workshop sponsored by the Georgia Forestry Association's and the American Forest and Paper Association. The workshop's goal is to train every logger in the state on BMPs. In addition, the Georgia State Board of Registration for Foresters requires every licensed forester to implement BMPs as a minimum standard of practice. The new Forestry BMPs, scheduled for printing in June 1998, will result in additional sedimentation reductions and leave more riparian tree cover over perennial and intermittent streams when they become standard within the industry.

GFC conducted statewide BMP Compliance Surveys in 1991 and again in 1992 and is in the process of conducting one in 1998. During the 1992 survey, the GFC evaluated 250 acres in the Tallapoosa Basin and determined that, of the activities, 44 percent of the roads and 81 percent of the harvested acres were in compliance with BMPs. No site prepared acres or regenerated acres were evaluated.

EPD serves as an "Issuing Authority" in those localities across the state that do not have a local E & SC ordinance or program. EPD provides permitting, inspection, compliance, and enforcement services in these areas.

There are several urban-focused erosion educational initiatives are under way. Each year GSWCC and EPD conduct five formal E&SC courses to provide training to the regulated community, regulators, consultants, and interested citizens. GSWCC also provides detailed E&SC training to from 8 to 11 units of government each year. A task force established by the Lieutenant Governor, the Erosion and Sediment Control Technical Study Committee, also known as DIRT II, is assessing the economic and environmental impacts of erosion prevention and sediment control BMPs for urban construction sites. Another urban initiative is the U.S. Forest Service's Planting Along Stream Sides (PASS) which deals with vegetative plantings to reduce erosion from streambanks.

Identified Gaps and Needs

Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring, for which improved capabilities are needed. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. The WRD is working with the Integrated Biotic Index (IBI) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

A key for addressing erosion, sedimentation, and habitat issues on highly impacted streams is definition of appropriate management goals. Many such streams cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established through consultation among EPD, partners, and other stakeholders.

Many privately owned sawmills are not members of the American Forest and Paper Association, and there is no good way of requiring these mills and their producers to come to the Master Timber Harvesters Workshops. The GFC, UGA, GFA, and Southeastern Wood Producers Association are working on a solution. Education of private landowners who are selling timber for the last time prior to land development is still needed. Many such landowners attempt to maximize return on timber, sometimes at the expense of BMPs.

Much of the sediment being produced and adversely affecting streams and lakes is associated with road development and maintenance. In many instances, the E&SC plans, implementation, inspection, and enforcement are not adequate on Department of Transportation- and county-sponsored road projects. Without aggressive inspection and enforcement contractors sometimes tend to let erosion problems happen and attempt to mitigate after the fact. Georgia DOT and other agencies charged with E&SC need to work with county road departments in identifying road segments that are high sediment producers and recommend abatement measures. Further monitoring might be needed to quantify the impact of unpaved rural roads as a source of sedimentation into streams.

Strategies for Action

Understanding of the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are affected by a variety of stressors. An incremental or phased approach is needed to address these issues.

Most agricultural sediment reduction practices are expensive and landowners are reluctant to spend today's dollars for long term BMP amortization in uncertain future markets. Agricultural cost-share dollars (Farm Bill) and perhaps low-interest loans (Clean Water Act State Revolving Fund) need to be concentrated in priority watersheds with sufficient technical workforce to implement enough BMPs through long-term agreements or contracts to reduce sediment loading.

Key Participants and Roles

- EPD will encourage local government water quality improvement efforts and continue the development of biomonitoring methods.
- Local governments will enforce erosion controls for construction practices and implement land use planning.
- GSSWC and local SWCDs and RC&D Councils, with assistance from NRCS, will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will encourage compliance with forestry BMP guidelines.
- Citizen groups will implement Adopt-A-Stream programs and work with local governments in implementing watershed initiatives.

Specific Management Objectives

Control erosion and sedimentation from land-disturbing activities to meet water quality standards.

Management Option Evaluation

During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan

- GSSWC and local SWCDs and RC&D Councils, with assistance from NRCS, will encourage the implementation of BMPs to control erosion of agricultural lands. Local SWCDs will convene Local Work Groups to identify local resource concerns and develop proposals for funding to address these concerns.
- GFC will target landowner and user groups for BMP education to encourage compliance with forestry BMP guidelines.
- EPD will work with local governments with issuing authority for erosion and sedimentation controls first through education and second through enforcement to control erosion at construction site and will encourage local governments to implement land use planning.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic life.

Method for Tracking Performance

GSWCC, GFC, EPD, and issuing authorities will track BMP implementation—GSWCC by the number of E&SC plans reviewed and DAT evaluations and recommendations, GFC through its biannual surveys, and EPD through routine inspections of permitted projects and through surveillance for any noncompliance and the conduct of necessary compliance and enforcement activities. NRCS will track BMP implementation through its NIMS reporting system.

7.3.4 Nutrients

Excess nutrient loads are a concern for all surface waters since they promote undesirable growths of floating and attached algae that can degrade habitat, deplete dissolved oxygen, and result in filter clogging and taste and odor problems for public water supply systems. Impacts are typically greatest in lakes and reservoirs; however, nutrients can also stimulate undesirable growths of attached algae in smaller rivers and streams. For this iteration of the Tallapoosa River basin plan, nutrients have not been identified as a significant issue within the Georgia portion of the basin; however, nutrients may be an issue within Harris Reservoir in Alabama, which receives drainage from the Georgia portion of the basin.

Problem Statement

The water use classifications of fishing and recreation are potentially threatened in Harris Reservoir due to inputs of nutrients that might cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

General Goals

Meet water quality standards and maintain nutrient loading at levels sufficient to support designated uses within Harris Reservoir.

Ongoing Efforts

NRCS, in cooperation with other agencies, is working with local landowners to implement agricultural best management practices with cost-sharing funds under PL-566. The project is referred to locally as the Lower Little Tallapoosa River Watershed Project. There have been local efforts to expand this project to include the entire Little Tallapoosa River Watershed.

The Lower Little Tallapoosa River Watershed Project is addressing agricultural animal waste as is the Section 319 Special BMP Demonstration Project in Carroll County. Soil and Water Conservation Districts annually convene Local Work Groups (LWGs) which are comprised of resource professionals from a variety of disciplines and interested stakeholders at the local level, to identify resource concerns in their area. These LWGs develop proposals for USDA or other funding to address identified resource concerns.

Identified Gaps and Needs

The Clean Lake Study will provide information on nutrient concentrations and sources.

Strategies

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the Tallapoosa basin upstream of Harris Reservoir to minimize nutrient inputs into the lake and comply with future water quality standards.

7.3.5 Protection of Threatened and Endangered Species

Problem Statement

The Tallapoosa basin is home to a number of aquatic species that have been listed as threatened or endangered and require protection.

General Goals

To provide aquatic habitat and management to support the survival and propagation of threatened and endangered species; to meet or exceed state and federal laws, rules, and regulations for the protection of endangered species; and to incorporate planning for protection of threatened and endangered species into all aspects of basin planning.

Ongoing Efforts

Information on ongoing efforts to protect threatened and endangered species in the Tallapoosa River basin was not available at the time of the preparation of this draft plan.

7.3.6 Water Quantity Demand

Problem Statement

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate, and recreation uses might not be available within the Tallapoosa River basin (HUC 03150108). In addition, the state of Alabama is concerned about the potential effects of reservoir construction and growth of water use in west Georgia on downstream water flow and availability.

General Goals

Provide adequate water supplies to meet Georgia's needs for future water withdrawals and for assimilation of wastewater discharges.

Ongoing Efforts

In response to the 1986-1988 drought period and to the need for regional water supply options, the 1989 General Assembly passed the Water Supply Act, effective April 18, 1989. The Act authorizes the Department of Natural Resources (DNR) to initiate projects to provide adequate water for the State's future, to supplement current community needs in the event of prolonged drought, and promote the use of projects for the public good and general welfare. The Act authorizes DNR to acquire lands for water supply projects, compensate for any environmental alterations, and to manage the projects. Capital and operating costs would be recouped through user fees paid by local governments contracting with DNR for the water.

The DNR pursued the first regional reservoir site to satisfy 2050 water demand in the counties of Polk, Haralson, Carroll, Douglas, and Paulding. The intent was to build a reservoir that would maximize water supply for the surrounding area while minimizing the need for many smaller projects. DNR chose a site on the Tallapoosa River about 5 miles from the Alabama border. Alabama opposed the project and with the initiation of the ACT/ACF Comprehensive Study, this proposed regional reservoir was put on hold.

Water quantity needs and allocations throughout the entire basin are being addressed through the ACT/ACF Study. The ACT Compact has been approved, and Compact Commission meetings began in February of 1998. The Commission is charged with the responsibility of developing an allocation formula for the basin by December 31, 1998, which will be acceptable to the states of Alabama and Georgia, as well as the federal government. Projections of future water needs indicate that not all demands can be met under historic conditions of water shortages without construction of a reservoir.

While the ACT/ACF Study was underway, DNR undertook a water supply study to develop a number of water supply alternatives for this region. This water supply study was done in cooperation with the West Georgia Regional Water Authority Board (WGRWA), comprised of representatives from the five counties, and a Technical Advisory Group, consisting of representatives from stakeholders in the region. Ultimately, the WGRWA chose to go with the original Regional Reservoir site near the Alabama-Georgia state line and have the WGRWA apply for any permits necessary to build the reservoir. The WGRWA has agreed to postpone the permit application process until the three states have agreed on a water allocation formula for the ACT/ACF or until 12/31/98, whichever comes first.

Aquatic habitat can be adversely affected by unnatural variations in lake levels and river flow. One significant issue which is receiving increasing attention is that of the minimum stream flow rate which must be maintained below reservoirs and river water withdrawals. In September of 1996, the Directors of EPD and the Wildlife Resources Division (WRD) empaneled a multi-disciplinary group of stakeholders to review EPD's existing minimum stream flow policy of protecting the lowest seven-day average flow which occurs with a frequency of one in a ten-year period (7Q10 flow). In November of 1997 this group submitted a set of recommendations, which concluded that there was sufficient cause to modify the current policy to better protect stream biological diversity and aquatic habitats, but that there was not a sufficient number of site-specific studies in Georgia on which to base a definitive long-term modification to the current policy. The groups recommended that interim modifications to the current policy be employed until such time as sufficient data are available to establish a scientifically defensible long-term policy.

Identified Gaps and Needs

The models and databases that have been under development for the Comprehensive Study since 1991 must be completed and approved prior to development of an allocation formula. Negotiations will take place during 1998 to reach an agreement on water allocation out to the year 2050.

Additional data are required to establish a scientifically defensible long-term policy for minimum instream flows.

Strategies for Action

Water quantity will be managed in the context of the ACT/ACF allocation process, which is expected to address such issues as reservoir operation and storage volume reallocation, as well as defining the portion of Tallapoosa basin flows that will be available for Georgia's use. If successful, the allocation is expected to be effective by the latter half of 1999. Georgia will be responsible for delivery of certain flows to Alabama under specified conditions, but neither the Compact nor the Commission will interfere with Georgia's internal decision-making process or affect allocations of water within Georgia. Georgia will not agree to an allocation for the ACT basin that falls significantly short of its expected needs in a drought, though there might be less-than-optimal quantities of water for some uses in times of shortage.

Key Participants and Roles

- The ACT Compact Commission is responsible for developing the water allocation formula. The Commission consists of two voting members, who are the governors of the states of Georgia and Alabama, and one nonvoting Federal Commissioner, who has not yet been appointed by the President. In addition, each Commissioner has the right to appoint alternate Commissioners to act is his or her place when unable to attend.
- The states of Georgia and Alabama are parties to the ACT allocation process.
- The U.S. Army Corps of Engineers has the primary operational control of flow of water within the basin.
- Stakeholders representing the various public, private, and business interests in water use and conservation within the states of Alabama and Georgia are actively involved in providing input to the states and federal government about the best ways to manage water resources in the ACT basin.
- The federal government, with the Corps of Engineers as lead agency, is preparing an Environmental Impact Statement to evaluate the impacts of the chosen allocation formula and management procedures.
- The West Georgia Regional Water Authority is prepared to submit a Section 404 permit application to the Corps of Engineers for the West Georgia Regional Reservoir on the Tallapoosa River in Haralson County. The application may be delayed until the states have agreed upon a proposed water allocation formula for the ACT basin, that is until 1999. Once submitted, however, that application will initiate the formal environmental impact statement (EIS) process to meet the Corps of Engineers requirements for compliance with the National Environmental Policy Act (NEPA).

- EPD and WRD are responsible for establishing minimum instream flow requirements below permitted withdrawals.

Specific Management Objectives

Develop an allocation of water resources in the ACT basin, including the Tallapoosa River basin, which will satisfy the projected needs of Alabama and Georgia, as well as the federal government, through the year 2050.

Management Option Evaluation

A formal evaluation of management options will take place as part of the ACT basin allocation process. Planning for the Tallapoosa River basin must be consistent with the ACT allocation. However, detailed Tallapoosa basin management activities will not be determined by the interstate agreement since local control of water resource decisions will be retained.

Action Plan

- Complete ACT allocation formula by December 31, 1998.
- Federal concurrence (or nonconcurrence) within 255 days of the allocation formula.
- Following concurrence with the formula, EPD will work with county and municipal governments and with other stakeholders to develop an action plan that is consistent with the formula.
- EPD and WRD will develop a final long-term policy for minimum instream flow requirements.

Method for Tracking Performance

To be determined.

7.3.7 Source Water Protection for Drinking Water Sources

Problem Statement

Many public water supplies have no control over their source watersheds and have to spend additional treatment dollars to ensure a high-quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed and implemented.

General Goals

EPD will establish proactive planning and management to maintain the safety and high quality of drinking water sources on all streams with municipal water intakes by having watershed assessments and protection plans developed and implemented. All streams and existing lakes under serious consideration for use as public water supplies will have a source water assessment made early in the planning process.

Ongoing Efforts

Georgia EPD is developing a source water assessment program (SWAP) in alignment with EPA's initiatives. EPD is working with USGS on some program elements and is beginning to work with some water authorities in starting the process. Some water authorities and local governments have adopted source water protection measures in conjunction with Growth Strategies Initiatives.

Identified Gaps and Needs

This is a new and more comprehensive initiative, and neither EPD nor many local authorities have much experience in performing the assessments and developing the protection plans. The Implementation Plan is still under development by EPD.

There are complexities in developing an assessment that would be general to all watersheds because of the varying land uses. Therefore, EPD has the task of deriving a number of approaches that can be applied to a watershed depending on the development and land uses within it. EPD must derive these approaches with the assistance of advisory committees and the public prior to submitting the SWAP Implementation Plan to EPD.

EPD must also find effective measures to promote and encourage local communities to adopt source water protection programs using the assessment results.

Strategies for Action

EPD will develop a SWAP Implementation Plan and submit it to the USEPA by February 6, 1999. EPD will describe in the SWAP Implementation Plan methods and approaches for (1) delineating the source water protection areas for all public water supply sources within the state (the outer management zone for ground water sources); (2) inventorying potential contaminants within the delineated protection zone; (3) determining water supply susceptibility to significant potential contaminants within the protection zone; and (4) involving the public in developing SWAPs and making assessments available to the public.

Key Participants and Roles

EPD; local governments; water authorities; federal, state, and local agencies; and special interest groups.

Specific Management Objectives

EPD is actively working toward the following national goal: By the year 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs (SWPP) in place under both wellhead protection and watershed protection programs. EPD intends to accomplish this goal by developing and implementing a source water assessment program (SWAP) in alignment with EPA's initiatives.

Management Option Evaluation

Formulation will be on a site-by-site basis and will be updated with each planning cycle in the basin.

Action Plan

- EPD will submit a SWAP Implementation Plan to USEPA by February 6, 1999.
- Identify water intakes and authorities.
- Delineate watersheds contributing to intakes.

- Establish criteria and guidelines for assessments and protection plans.
- Provide support to water authorities and local governments.
- Review and approve source water protection plans.

Methods for Tracking Performance

To be determined.

In This Section

- Where Do We Go From Here?
- Working to Strengthen Planning and Implementation Capabilities
- Addressing the Impacts from Continued Population Growth and Land Development
- The Next Iteration of the Basin Cycle
- Priorities for Additional Data Collection

Section 8

Future Issues and Challenges

8.1 Where Do We Go From Here?

The Dynamic Process of Basin Management

This plan represents another step in managing the water resources in the Tallapoosa River basin, but not the final step. It is important for all to understand that effective basin management is ongoing and dynamic because changes in resource use and conditions occur continually, as do changes in management resources and perspectives. Therefore, management planning and implementation must remain flexible and adapt to changing needs and capabilities.

Building On Past Improvements

For the past few decades, management efforts have resulted in substantial improvements in water quality, and reduction in pollutant loading for many waters (see examples in Section 4). Many of these improvements stem from increased wastewater treatment by municipalities and industries, and from landowner implementation of best management practices that help reduce soil and contaminated runoff. Indeed, many of the waterbodies in the basin are fully supporting their designated uses. The assessments summarized in this plan show, however, that not all waters are at the level of quality deemed necessary to support designated uses. There are waters still in need of restoration and attention beyond existing management efforts.

Participation by Many Different Stakeholders

The current and proposed strategies summarized in this plan do not "solve" all existing problems. Many of the unsolved problems will require actions by stakeholders other than those that have been involved in planning to date. For example, resolution of fecal coliform bacteria problems will typically require local government (e.g., dealing with urban storm water issues and leaking and overflowing sanitary sewers) and private landowner actions (e.g., correcting failed septic systems; using best management practices in animal operations and land application of waste residuals). Other issues will require significant additional time and effort before they are addressed sufficiently (e.g., restoration of riparian zones and aquatic habitat). Some of these issues may require trial management efforts and adapting those efforts over time based on observations of what works well, particularly where there is no 100 percent effective solution evident at the time of strategy development. Future management should focus on the priorities among these continuing needs, as determined by communities and partners in management.

In addition, continued growth in population is expected in the Tallapoosa basin (see Section 2). This growth will place additional demands on water resources and require corresponding responses in management. More people means more water use (drinking water, industrial consumption, irrigation), more storm water runoff (from impervious surfaces of new houses, roads, industries, businesses, and parking lots), and more contamination (sediment; nutrients; organic material; pesticides, herbicides, and other toxics). Therefore, it is essential that stakeholders continue to work together to plan and implement the most cost-effective ways of restoring and protecting water resources.

Blending Regulatory and Voluntary Approaches

Although the regulatory authorities of agencies such as EPD are important to protection and restoration of Georgia's waters, RBMP partners will continue to emphasize voluntary and cooperative approaches to watershed management. This will take time and be very challenging. Long-term protection means that the people, local governments, and businesses must learn collectively what is needed for protection and adapt their lifestyles and operations accordingly. Experience indicates that we are much more likely to buy into proposed management solutions in which we have a say and control over how we spend our time and money. The challenge in the future, therefore, is to continue to "build bridges" between regulatory and voluntary efforts, using each where they best serve the people and natural resources of Georgia.

8.2 Working to Strengthen Planning and Implementation Capabilities

Understanding One Another's Roles

Increasing awareness and understanding of the roles and capabilities of local, state, and federal partners is one of the keys to future success in basin management for the Tallapoosa River. Lack of understanding can lead to finger pointing and frustration on the part of all involved. Increasing opportunities for stakeholders to develop this awareness and understanding should result in more effective management actions.

This basin plan provides one opportunity for stakeholders to increase their awareness of conditions in the basin, and to learn about ongoing and proposed new management strategies. Within this context, stakeholders can develop a better understanding of certain roles and responsibilities. For example, this basin plan points out several areas where EPD has regulatory authority and corresponding duties including:

- Establishing water quality use classifications and standards
- Assessing and reporting on water quality conditions
- Facilitating development of River Basin Management Plans
- Issuing permits for point source discharges of treated wastewater, municipal storm water discharges as required, and land application systems

- Issuing water supply permits
- Enforcing compliance with permit conditions

There are many areas, however, where organizations or entities other than EPD are responsible. For example,

- Septic tank permitting and inspection (county health departments) and maintenance (individual landowners)
- Land development (land use) and zoning ordinances (local governments)
- Sanitary sewer and storm water ordinances (local governments)
- Water supply source water protection ordinances (local governments)
- Urban storm water and drainage (local governments)
- Erosion and sediment control (local governments)
- Siting of industrial parks, landfills, and wastewater treatment facilities (local governments)
- Floodplain management (FEMA, local governments)
- Implementation of forestry best management practices (landowners and Georgia Forestry Commission)
- Implementation of agricultural best management practices (landowners with support from state and federal agricultural agencies)
- Proper use, handling, storage, and disposal of chemicals (businesses, landowners, municipalities, counties, etc.)

These are only a few of the areas involved, but they illustrate how responsibilities are spread across many stakeholders in each basin. Additionally, there are other agencies and organizations that assist in planning and implementation in many of these areas—regional development centers; federal, state, and local technical assistance programs; citizens groups; and business associations. As stakeholders become more familiar with one another's responsibilities and capabilities, they will more frequently become aware of appropriate partners with whom they can work with to address their issues of concern.

Using the RBMP Framework to Improve Communication

Raising awareness frequently involves two-way communication. The RBMP framework's interactive planning and outreach sessions provide additional opportunities that support two-way communication. For example, Basin Technical Planning Team meetings provide opportunities for partners to share information on their responsibilities and capabilities with one another. Similarly, Local Advisory Committee meetings and stakeholder meetings provide opportunities for citizens, businesses, government agencies, associations, and others to share information and learn from one another. Although often requiring considerable time, these interactions are critical to the future of management in the basin because they build the working relationships and trust that are essential to carrying out effective, integrated actions.

Continuing to Streamline Our Efforts

Increased coordination will also result if partners in this approach continue to streamline their efforts. There are many laws and requirements with related and complementary goals, e.g., Georgia's Growth Strategies Act, Planning Act, River Corridor Protection Act, Comprehensive Ground Water Management Plan, and River

Basin Management Planning requirements, in addition to federal Clean Water Act water quality regulations and Safe Drinking Water Act source water protection requirements. Partners should continue to find ways to make actions under these laws consistent and complementary by eliminating redundancy and leveraging efforts. Again, partners can use the forums within the RBMP framework (e.g., river basin team and advisory committees) to discuss and implement ideas to streamline roles and make the best use of their funds and staff resources.

8.3 Addressing the Impacts from Continued Population Growth and Land Development

Supporting More Consistent Implementation of Protection Measures

To address the impacts from anticipated population growth and increased land development in the basin, management will need to build on the increased understanding of roles and to use forums to coordinate and develop more specific action plans. Historically, mitigating impacts from newly developed areas has been approached mostly on a case-by-case basis. Unfortunately, this approach has resulted in inconsistent planning and implementation of water resource protection measures. River basin planning offers an opportunity for a more consistent approach by making it easier for landowners, local governments, and businesses to work together at the watershed and basin level.

One way that Georgia EPD will address this issue is by only approving new and expanding permits for water withdrawals and wastewater discharges that are consistent with the basin plan and meet the intent of the Georgia Planning Act. Rather than waiting for the permit application process, however, local governments can work together and with EPD to resolve some of these issues in advance. There are incentives for organizations such as the Georgia Water Pollution Control Association (WPCA), the Georgia Municipal Association (GMA), the Association of County Commissioners of Georgia (ACCG), and Regional Development Centers (RDCs) to work out consistent methods to conduct watershed assessments in developing areas and for improving the implementation of protection measures as development occurs. EPD, DCA, and other partners can coordinate by facilitating discussion at RBMP meetings and supporting local initiatives aimed at this issue. An excellent example of this cooperative effort is the Georgia Water Management Campaign being facilitated by ACCG in cooperation with the Georgia EPD, GMA, and the Georgia Environmental Facilities Authority.

Working Closely with the ACF Interstate Commission

Another future challenge is securing sufficient allocation of water from the ACF Interstate Commission to maintain needed water supplies for municipal, agricultural, and other purposes in the face of increasing growth and land development pressure. During the remainder of 1998, the states of Alabama, Florida, and Georgia, together with the Corps of Engineers, will complete the ACT/ACF data base and modeling effort to analyze alternative options for management of water quantity. The Interstate Commission will be responsible for developing a water allocation formula by the end of 1998. The affected states and their citizens will need to work together to critique, improve, approve, and implement the allocations.

8.4 The Next Iteration of the Basin Cycle

Building on Previous, Ongoing, and Planned Efforts

As discussed above and in Section 7, there is more work to do to adequately restore and protect all of Georgia's water resources. After focusing on the implementation of this plan, the Tallapoosa River basin will enter into its second iteration of the basin management cycle (scheduled for April 2000). The next cycle will provide opportunity to review issues that were not fully addressed during the first cycle and to reassess or identify of any new priority issues. In other words, future management efforts can and should build on the foundation created by previous, ongoing, and already planned management actions.

Providing Historical Reference for the Next Basin Plan

Partners will not have to "start from scratch" during the next iteration of the basin planning cycle. The information in this document provides a historical account of what is known and planned to date. Stakeholders in the Tallapoosa basin will know what was accomplished in the first iteration and therefore, will be able to focus on enhancing ongoing efforts or filling gaps. Data collection and public discussion activities scheduled early in the next cycle can draw on information in the plan to identify areas in need of additional monitoring, assessment, and strategy development.

8.5 Priorities for Additional Data Collection

In 1996, monitoring efforts were focused on the Tallapoosa, Oconee, and Tallapoosa River basins in accordance with the EPD basin planning schedule. Intensive monitoring will return to the Tallapoosa basin in support of the next iteration of the basin planning cycle in 2001. Prior to that time, EPD and partners will develop a strategic monitoring plan for the Tallapoosa. The monitoring plan will have two major components—general assessment of water quality status within the basin and targeted assessment to address priority issues and concerns.

River Basin Planning Act

(O.C.G.A. 12-5-520 to 525)

92 SB637/AP

Senate Bill 637

By: Senators Johnson of the 47th, Pollard of the 24th, Edge of the 28th and Egan of the 40th.

An Act

To amend Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, so as to define certain terms; to provide for the development of river basin management plans for certain rivers; to provide for the contents of such plans; to provide for the appointment and duties of local advisory committees; to provide for notice and public hearings; to provide for submission to and approval of plans to the Board of Natural Resources; to make certain provisions relative to issuing certain permits; to provide for the application for and use of certain funds; to provide that this Act shall not enlarge the powers of the Department of Natural Resources; to repeal conflicting laws; and for other purposes.

Be It Enacted by the General Assembly of Georgia:

Section 1. Chapter 5 of Title 12 of the Official Code of Georgia Annotated, relating to water resources, is amended by inserting at the end thereof the following:

Article 8

12-5-520. As used in this article, the term:

(1) "Board" means the Board of Natural Resources.

(2) "Director" means the director of the Environmental Protection Division of the Department of Natural Resources.

12-5-521. The director shall develop river basin management plans for the following rivers: Alapaha, Altamaha, Canoochee, Chattahoochee, Coosa, Flint, Ochlocknee, Ocmulgee, Oconee, Ogeechee, St. Marys, Satilla, Savannah, Suwanee, Tallapoosa, and Tennessee. The director shall consult the chairmen of the local advisory committees on all aspects of developing the management plans. The director shall begin development of the management plan for the Chattahoochee and Flint river basins by December 31, 1992, and for the Coosa and Oconee river basins by December 31, 1993. Beginning in 1994, the director shall begin development of one management plan per calendar year until all required management plans have been begun. All management plans shall be completed not later than five years after they were begun and shall be made available to the public within 180 days after completion.

12-5-522. The management plans provided by Code Section 12-5-521 shall include, but not be limited to, the following:

(1) A description of the watershed, including the geographic boundaries, historical, current, and projected uses, hydrology, and a description of water quality, including the current water quality conditions;

(2) An identification of all governmental units that have jurisdiction over the watershed and its drainage basin;

(3) An inventory of land uses within the drainage basin and important tributaries including point and nonpoint sources of pollution;

(4) A description of the goals of the management plan, which may include educating the general public on matters involving the environmental and ecological concerns specific to the river basin, improving water quality and reducing pollution at the source, improving aquatic habitat and reestablishing native species of fish, restoring and protecting wildlife habitat, and providing recreational benefits; and

(5) A description of the strategies and measures necessary to accomplish the goals of the management plan.

12-5-523. As an initial action in the development of a management plan, the director shall appoint local advisory committees for each river basin to consist of at least seven citizens and a chairman appointed by the director. The local advisory committees shall provide advice and counsel to the director during the development of the management plan. Each committee shall meet at the call of the chairman but not less than once every four months. The chairman and members of the local advisory committees shall serve without compensation or reimbursement of expenses.

12-5-524.

(a) Upon completion of the penultimate draft of a management plan, the director shall conduct public hearings within the river basin. At least one public hearing shall be held in each river basin named in Code Section 12-5-521. The director shall publish notice of each such public hearing in a newspaper of general circulation in the area announcing the date, time, place, and purpose of the public hearing. A draft of the management plan shall be made available to the public at least 30 days prior to the public hearing. The director shall receive public comment at the public hearing and for a period of at least ten days after the public hearing.

(b) The division shall evaluate the comments received as a result of the public hearings and shall develop the final draft of the management plan for submission to the board for consideration within 60 days of the public hearing.

(c) The board shall consider the management plan within 60 days after submission by the director. The department shall publish the management plan adopted by the board and shall make copies available to all interested local governmental officials and citizens within the river basin covered by such management plan.

(d) Upon the board's adoption of a final river basin management plan, all permitting and other activities conducted by or under the control of the Department of Natural Resources shall be consistent with such plan.

(e) No provision of this article shall constitute an enlargement of the existing statutory powers of the department.

12-5-525. The director is directed to apply for the maximum amount of available funds pursuant to Sections 106, 314, 319, and 104(b)(2) of Public Law 95-217, the federal Clean Water Act, and any other available source for the development of river basin management plans."

Section 2. All laws and parts of laws in conflict with this Act are repealed.

Georgia Instream Water Quality Standards For All Waters: Toxic Substances

(Excerpt From Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.03 Water Use Classifications and Water Quality Standards)

I Instream concentrations of the following chemical constituents which are considered to be other toxic pollutants of concern in the State of Georgia shall not exceed the criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones:

1. 2,4-Dichlorophenoxyacetic acid (2,4-D) 70 µg/l
2. Methoxychlor* 0.03 µg/l
3. 2,4,5-Trichlorophenoxy propionic acid (TP Silvex) 50 µg/l

II Instream concentrations of the following chemical constituents listed by the U.S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under 7-day, 10-year minimum flow (7Q10) or higher stream flow conditions except within established mixing zones or in accordance with site specific effluent limitations developed in accordance with procedures presented in 391-3-6-.06.

1. Arsenic
   - (a) Freshwater 50 µg/l
   - (b) Coastal and Marine Estuarine Waters 36 µg/l
2. Cadmium
   - (a) Freshwater
     - (at hardness levels less than 100 mg/l) 0.7 µg/l*
     - (at hardness levels of 100 mg/l to 199 mg/l) 1.1 µg/l*
     - (at hardness levels greater than or equal to 200 mg/l) 2.0 µg/l*

   Note: Total hardness expressed as $CaCO_3$.
   - (b) Coastal and Marine Waters 9.3 µg/l
3. Chlordane*
   - (a) Freshwater 0.0043 µg/l
   - (b) Coastal and Marine Estuarine Waters 0.004 µg/l
4. Chromium (VI)
   - (a) Freshwater 11 µg/l
   - (b) Coastal and Marine Estuarine Waters 50 µg/l
5. Total Chromium
   - (at hardness levels less than 100 mg/l) 120 µg/l
   - (at hardness levels of 100 mg/l to 199 mg/l) 210 µg/l
   - (at hardness levels greater than or equal to 200 mg/l) 370 µg/l

   Note: Total hardness expressed as $CaC0_3$.
6. Copper
   - (a) Freshwater
     - (at hardness levels less than 100 mg/l) 6.5 µg/l*
     - (at hardness levels of 100 mg/l to 199 mg/l) 12 µg/l
     - (at hardness levels greater than or equal to 200 mg/l) 21 µg/l

     Note: Total hardness expressed as $CaCO_3$.
   - (b) Coastal and Marine Estuarine Waters 2.9 µg/l*
7. Cyanide*
   - (a) Freshwater 5.2 µg/l
   - (b) Coastal and Marine Estuarine Waters 1.0 µg/l

8. Dieldrin* 0.0019 µg/l
9. 4,4'-DDT* 0.001 µg/l
10. a-Endosulfan*
    (a) Freshwater 0.056 µg/l
    (b) Coastal and Marine Estuarine Waters 0.0087 µg/l
11. b-Endosulfan*
    (a) Freshwater 0.056 µg/l
    (b) Coastal and Marine Estuarine Waters 0.0087 µg/l
12. Endrin* 0.002 µg/l
13. Heptachlor*
    (a) Freshwater 0.0038 µg/l
    (b) Coastal and Marine Estuarine Waters 0.0036 µg/l
14. Heptachlor Epoxide*
    (a) Freshwater 0.0038 µg/l
    (b) Coastal and Marine Estuarine Waters 0.0036 µg/l
15. Lead*
    (a) Freshwater
        (at hardness levels less than 100 mg/l) 1.3 µg/l
        (at hardness levels of 100 mg/l to 199 mg/l) 3.2 µg/l
        (at hardness levels greater than or equal to 200 mg/l) 7.7 µg/l
        Note: Total hardness expressed as $CaCO_3$.
    (b) Coastal and Marine Estuarine Waters 5.6 µg/l
16. Lindane [Hexachlorocyclohexane (g-BHC-Gamma)] 0.08 µg/l
17. Mercury*
    (a) Freshwater 0.012 µg/l
    (b) Coastal and Marine Estuarine Waters 0.025 µg/l
18. Nickel
    (a) Freshwater
        (at hardness levels less than 100 mg/l) 88 µg/l
        (at hardness levels of 100 mg/l to 199 mg/l) 160 µg/l
        (at hardness levels greater than or equal to 200 mg/) 280 µg/l
        Note: Total hardness expressed as $CaCO_3$.
    (b) Coastal and Marine Estuarine Waters 8.3 µg/l
19. Pentachlorophenol*
    (a) Freshwater 2.1 µg/l
    (b) Coastal and Marine Estuarine Waters 7.9 µg/l
20. PCB-1016 0.014 µg/l
21. PCB-1221 0.014 µg/l
22. PCB-1232 0.014 µg/l
23. PCB-1242 0.014 µg/l
24. PCB-1248 0.014 µg/l
25. PCB-1254 0.014 µg/l
26. PCB-1260 0.014 µg/l
27. Phenol 300 µg/l
28. Selenium
    (a) Freshwater 5.0 µg/l
    (b) Coastal and Marine Estuarine Waters 71 µg/l
29. Silver **
30. Toxaphene 0.0002 µg/l
31. Zinc
    (a) Freshwater
        (at hardness levels less than 100 mg/l) 60 µg/l
        (at hardness levels of 100 mg/l to 199 mg/l) 110 µg/l
        (at hardness levels greater than or equal to 200 mg/l) 190 µg/l
        Note: Total hardness expressed as $CaCO_3$.
    (b) Coastal and Marine Estuarine Waters 86 µg/l

Notes:

- The in-stream criterion is lower than the EPD laboratory detection limits.

** Numeric limits are not specified. This pollutant is addressed in 391-3-6-.06.

III Instream concentrations of the following chemical constituents listed by the U. S. Environmental Protection Agency as toxic priority pollutants pursuant to Section 307(a)(1) of the Federal Clean Water Act (as amended) shall not exceed criteria indicated below under annual average or higher stream flow conditions:

1. Acenaphthene **
2. Acenaphthylene **
3. Acrolein 780 µg/l
4. Acrylonitrile 0.665 µg/l
5. Aldrin 0.000136 µg/l

6.	Anthracene	110000 µg/l
7.	Antimony	4308 µg/l
8.	Arsenic	0.14 µg/l
9.	Benzidine	0.000535 µg/l
10.	Benzo(a)Anthracene	0.0311 µg/l
11.	Benzo(a)Pyrene	0.0311 µg/l
12.	3,4-Benzofluoranthene	0.0311 µg/l
13.	Benzene	71.28 µg/l
14.	Benzo(ghi)Perylene	**
15.	Benzo(k)Fluoranthene	0.0311 µg/l
16.	Beryllium	**
17.	a-BHC-Alpha	0.0131 µg/l
18.	b-BHC-Beta	0.046 µg/l
19.	Bis(2-Chloroethyl)Ether	1.42 µg/l
20.	Bis(2-Chloroisopropyl)Ether	170000 µg/l
21.	Bis(2-Ethylhexyl)Phthalate	5.92 µg/l
22.	Bromoform (Tribromomethane)	360 µg/l
23.	Carbon Tetrachloride	4.42 µg/l
24.	Chlorobenzene	21000 µg/l
25.	Chlorodibromomethane	34 µg/l
26.	2-Chloroethylvinyl Ether	**
27.	Chlordane	0.000588 µg/l
28.	Chloroform (Trichloromethane)	470.8 µg/l
29.	2-Chlorophenol	**
30.	Chrysene	0.0311 µg/l
31.	Dibenzo(a,h)Anthracene	0.0311 µg/l
32.	Dichlorobromomethane	22 µg/l
33.	1,2-Dichloroethane	98.6 µg/l
34.	1,1-Dichloroethylene	3.2 µg/l
35.	1,3-Dichloropropylene (Cis)	1700 µg/l
36.	1,3-Dichloropropylene (Trans)	1700 µg/l
37.	2,4-Dichlorophenol	790 µg/l
38.	1,2-Dichlorobenzene	17000 µg/l
39.	1,3-Dichlorobenzene	2600 µg/l
40.	1,4-Dichlorobenzene	2600 µg/l
41.	3,3'-Dichlorobenzidine	0.077 µg/l
42.	4,4'-DDT	0.00059 µg/l
43.	4,4'-DDD	0.00084 µg/l
44.	4,4'-DDE	0.00059 µg/l
45.	Dieldrin	0.000144 µg/l
46.	Diethyl Phthalate	120000 µg/l
47.	Dimethyl Phthalate	2900000 µg/l
48.	2,4-Dimethylphenol	**
49.	2,4-Dinitrophenol	14264 µg/l
50.	Di-n-Butyl Phthalate	12100 µg/l
51.	2,4-Dinitrotoluene	9.1 µg/l
52.	1,2-Diphenylhydrazine	0.54 µg/l
53.	Endrin Aldehyde	0.81 µg/l
54.	Endosulfan Sulfate	2.0 µg/l
55.	Ethylbenzene	28718 µg/l
56.	Fluoranthene	370 µg/l
57.	Fluorene	14000 µg/l
58.	Heptachlor	0.000214 µg/l
59.	Heptachlor Epoxide	0.00011 µg/l
60.	Hexachlorobenzene	0.00077 µg/l
61.	Hexachlorobutadiene	49.7 µg/l
62.	Hexachlorocyclopentadiene	17000 µg/l
63.	Hexachloroethane	8.85 µg/l
64.	Indeno(1,2,3-cd)Pyrene	0.0311 µg/l
65.	Isophorone	600 µg/l
66.	Lindane [Hexachlorocyclohexane (g-BHC-Gamma)]	0.0625 µg/l
67.	Methyl Bromide (Bromomethane)	4000 µg/l
68.	Methyl Chloride (Chloromethane)	**
69.	Methylene Chloride	†
70.	2-Methyl-4,6-Dinitrophenol	765 µg/l
71.	3-Methyl-4-Chlorophenol	**
72.	Nitrobenzene	1900 µg/l
73.	N-Nitrosodimethylamine	8.12 µg/l
74.	N-Nitrosodi-n-Propylamine	**
75.	N-Nitrosodiphenylamine	16.2 µg/l
76.	PCB-1016	0.00045 µg/l
77.	PCB-1221	0.00045 µg/l
78.	PCB-1232	0.00045 µg/l
79.	PCB-1242	0.00045 µg/l
80.	PCB-1248	0.00045 µg/l
81.	PCB-1254	0.00045 µg/l
82.	PCB-1260	0.00045 µg/l
83.	Phenanthrene	**
84.	Phenol	4,600,000 µg/l
84.	Pyrene	11,000 µg/l
85.	1,1,2,2-Tetrachloroethane	10.8 µg/l
85.	Tetrachloroethylene	8.85 µg/l
87.	Thallium	48 (6.3) µg/l ‡
88.	Toluene	200000 µg/l
89.	1,2-Trans-Dichloroethylene	**
90.	1,1,2-Trichloroethane	41.99 µg/l
91.	Trichloroethylene	80.7 µg/l
92.	2,4,6-Trichlorophenol	6.5 µg/l
93.	1,2,4-Trichlorobenzene	**
94.	Vinyl Chloride	525 µg/l

Notes:

** Numeric limits are not specified. These pollutants are addressed in 391-3-6-.06.

† EPD has proposed to the Board of Natural Resources changing numeric limits for methylene chloride from unspecified to 1600 µg/l consistent with EPA's National Toxics Rule.

‡ EPD has proposed to the Board of Natural Resources changing numeric limits for thallium from 48 to 6.3 µg/l consistent with EPA's National Toxics Rule.

IV Site specific criteria for the following chemical constituents will be developed on an as-needed basis through toxic pollutant monitoring efforts at new or existing discharges that are suspected to be a source of the pollutant at levels sufficient to interfere with designated uses:

1. Asbestos

V Instream concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) must not exceed 0.0000012 µg/l under long-term average stream flow conditions.

(e) Applicable State and Federal requirements and regulations for the discharge of radioactive substances shall be met at all times.

Point Source Control Efforts

Georgia DNR's management has promoted continuing improvement in the quality of return flows from permitted point sources in the basin. During the past twenty-five years, the majority of our municipal wastewater treatment plants were constructed or updated to meet state and/or federally mandated effluent standards. State and federal construction grants and the citizens of local municipalities funded these projects. This massive construction program has been so successful that over 90% of all these facilities in Georgia are currently meeting their effluent limits. We must protect our investments in these facilities and in the State's water quality.

The history of construction improvements for permitted dischargers within the Tallapoosa basin is summarized in the following table:

HUC 03150108

1956	West Haralson School 0.015 MGD septic tank system with sand filters constructed.
1970	Haralson County High School 0.015 MGD package treatment plant with aerated polishing pond constructed.
1971	Southwire Company installed 0.0225 MGD physical/chemical treatment system, $250,000.
1972	Plantation Pipeline in Bremen installed a dissolved air floatation treatment unit to remove suspended oil.
1974	Southwire Company treated industrial wastewater redirected to City of Carrollton sewer system.
1975	Buchanan 0.12 MGD extended aeration treatment plant constructed.
1976	Southwire Company cooling water collection and recycle system installed, $500,000.
1977	Copper Division of Southwire Company, CDS, installed a one million gallon collection impoundment and hydroxide precipitation treatment system to remove metals from stormwater, $240,000.
1979	CDS hydroxide precipitation plant upgraded with an additional clarifier and filters, $60,000.
1979	Carroll County Board of Education constructed a 0.015 MGD Mount Zion Sanitary Waste System. This subsurface system contained two gravel pre-filters, dosing chamber, sand filter and chlorine contact chamber.
1981	CDS constructed 150,000 gallon stormwater collection basin with pumping station, $150,000.
1987	CDS replaced the 1 MG stormwater impoundment with a 3 MG concrete tank, $1,300,000.
1990	City of Carrollton Little Tallapoosa Water Pollution Control Facility Spray Irrigation System constructed, $10,000,000.
1990	Carroll County Water Authority expanded the Fairfield Plantation WPCP and utilize spray irrigation for disposal.
1991	Southwire Company installed a wastewater evaporator to reduce recycle flow and sludge, $150,000.

1992	CDS replaced their existing stormwater treatment plant with a new 900 gallons per minute system using combined hydroxide/sulfide precipitation, $1,300,000.
1994	West Haralson School sand filtration system reworked with new sand and rock.
1994	Plantation Pipeline upgraded treatment system to include air stripper, $50,000.
1996	Bremen Buck Creek WTF upgraded and expanded to 0.9 MGD, $1,667,864.
1997	Southwire Company pretreatment system modified to add carbon filtration, $200,000.

NPDES Permits for Discharges in the Tallapoosa River Basin

Facility Name	NPDES #	Permitted Flow	Major?	County	Receiving Stream
HUC 03150108					
Bowdon WPCP	GA0023493	0.400		Carroll	Indian Creek
Bremen, Buck Crk WPCP	GA0021016	0.900		Haralson	Buck Creek
Bremen, Baxter Crk WPCP	GA0021008	0.200		Haralson	Baxter Creek
Buchanan WPCP	GA0021512	0.170		Haralson	Cochran Creek
DIT #44	GA0035921	0.009		Haralson	Williams Creek
Mt. Zion Elementary	GA0035769	0.015		Carroll	Little Turkey Creek
Plantation Pipeline	GA0030945	NPR		Haralson	Turkey Creek / Turner Creek Tributary
Southwire Wire Plant	GA0001139	NPR		Carroll	Buffalo Creek to Little Tallapoosa River
Southwire CDS	GA0001571	NPR		Carroll	Buffalo Creek
Tallapoosa WPCP	GA0020982	1.000	Y	Haralson	Green Creek
Villa Rica, Tallapoosa WPCP	GA0027162	0.260		Carroll	Little Tallapoosa River

Notes: NPR: Not a permit requirement.

Support of Designated Uses for Rivers and Streams in the Tallapoosa River Basin, 1996-1997

Name	Location (HUC 03150108)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses - HUC 3150108										
Baxter Creek (2)	Bremen - Haralson County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Beach Creek (4)	Haralson County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Brooks Creek	Carroll/Haralson Counties	Fishing	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Buck Creek (2)	Downstream Bremen - Carroll County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Cochran Creek (6)	Upstream Tallapoosa River - Haralson County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Lassetter Creek (4)	Haralson County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Little Tallapoosa River (1)	Little Tallapoosa Lake to Hwy 16	Fishing	S	N/A	N/A	N/A	11	N/A	N/A	N/A
Little Tallapoosa River (1,6)	Carrollton to Buffalo Creek	Fishing	S	N/A	N/A	N/A	16	N/A	N/A	N/A
Mann Creek (4)	Haralson County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Mud Creek	Carroll/Paulding Counties	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Swinney Branch (4)	Haralson/Polk Counties	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Tallapoosa River (4)	McClendon Creek to Water Mill Creek - Paulding and Haralson Counties	Drinking Water	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Thomasson Creek (4)	Haralson/Paulding Counties	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Trestle Creek (6)	Temple - Carroll County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Water Mill Creek (4)	Haralson/Paulding Counties	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A

Name	Location (HUC)	Water Use Classification	Status	Criterion Violated	Evaluated Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priorty
Rivers and Streams Partially Supporting Designated Uses - HUC 3150108										
Little Tallapoosa River (1,6)	Hwy 16 to Carrollton WPCP	Fishing	NS	Tox	I1	Douglas and Lomason eliminated the discharge 7/1/96.	2	X	1	NA
Little Tallapoosa River (1)	Buffalo Creek to Stateline	Fishing	NS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	14	X	X	3
Tallapoosa River (1,2,10)	Hwy. 100 to Stateline - Haralson County	Fishing	NS	Pb*	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	10	X	X	3
Tallapoosa River (1)	Water Mill Creek to Beach Creek	Fishing	NS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	21	X	X	3
Town Branch (1)	Villa Rica - Carroll/Douglas Counties	Fishing	NS	Tox	M	City completed toxicity reduction evaluation in 1994 and in compliance with permit.	1	X	2	1

Name	Location	Water Use Classification	Status	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Not Supporting Designated Uses - HUC 3150108										
Buffalo Creek (1)	Upstream Little Tallapoosa River	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	6	X	X	3
Buffalo Creek (1)	Downstream Southwire Corp. - Carroll County	Fishing	PS	Cu,Pb	I2	EPD Hazardous Waste Management Branch is working with the Southwire Corporation to assess and develop site cleanup options.	3	X	X	2

Name	Location	Water Use Classification	Status	Criterion Violated	Potential Cause(s)	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Tributary to Baxter Creek (2)	Bremen	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	1	X	3	3
Tributary to Buck Creek (2)	Bremen	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	1	X	3	3
Tributary to Buffalo Creek (1)	Carrollton	Fishing	PS	Cd,Cu,Pb,Ni,Zn, Se	I2	EPD Hazardous Waste Management Branch is working with the Southwire Corporation to assess and develop site cleanup options.	1	X	X	2

Data Source Codes (Column 1)

1 = EPD Watershed Planning and Monitoring Program
2 = EPD Permitting Compliance and Enforcement Program (Municipal)
4 = Wildlife Resources Division
7 = Gainesville College
8 = Georgia Institute of Technology
9 U.S. Environmental Protection Division
10 = U.S. Geologic Survey
11 = U.S. Army Corps of Engineers
14 = Cobb County
15 = DeKalb County
16 = Douglas County Water & Sewer Authority
17 = Fulton County
18 = Gwinnett County
20 = City of Gainesville
22 = Georgia Mountains, R.D.C.
25 = Lake Blackshear (Lake Blackshear Watershed Association)
26 = Lake Lanier (University of Georgia)
27 = West Point (LaGrange College/Auburn University
28 = Georgia Power Company
32 = Jones Ecological Resource Center
33 = Alabama DEM
34 = City of College Park
36 = University of Georgia
38 = Columbus Unified Government

Use Support Status (Column 4)

S = Supporting
PS = Partially Supporting
NS = Not Supporting

Criterion Violated Codes (Column 5)

Bio = Biota Impacted
Cd = Cadmium
Cu = Copper
DO = Dissolved Oxygen
FC = Fecal Coliform Bacteria
FCG = Fish Consumption Guidelines
Hg = Mercury
Pb = Lead
Temp = Temperature
Tox = Toxicity Indicated
Zn = Zinc
* = Minimal Database

Potential Cause Codes (Column 6)

CSO = Combined Sewer Overflow
I1 = Industrial Facility
I2 = Residual From Industrial Sources
M = Municipal Facility
NP = Nonpoint Sources/ Unknown Sources
UR = Urban Runoff/Urban Effects