Coosa 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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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 Coosa 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, Georgia 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

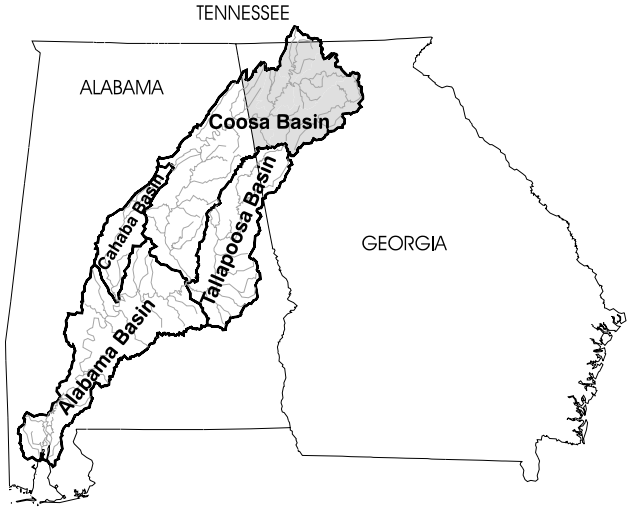
The purpose of this plan is to provide relevant information on the characteristics of the Coosa River basin, describe the status of water quality and quantity in the Coosa River basin, identify present and future water resource demands, present and facilitate the implementation of water quality protection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

This Coosa 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 Coosa River basin over the next five years. It contains useful information on the health of the Coosa River basin and recommended strategies to protect the basin now and into the future.



Coosa River Basin Characteristics

The Coosa River basin is located in the northwest part of Georgia, occupying an area of 4,619 square miles. The basin is characterized by mountainous terrain sloping down to rolling hills and plateaus. The upstream end of the basin reaches into Tennessee, and the whole basin drains into Alabama.

Water Resources

The surface water resources of the basin include several major rivers whose drainages define hydrologic units of the basin: the Coosa River mainstem, the Conasauga River, the Coosawattee River, the Oostanaula River, the Chattooga River, and the Etowah River. There are also two major reservoirs: Lake Allatoona, and Carters Lake.

Biological Resources

The basin encompasses parts of four major land resource areas (Cumberland Plateau, Valley and Ridge, Blue Ridge, Upper Piedmont), with a wide range of elevations, and slopes, providing many different ecosystem types. These ecosystems provide habitat for diverse species of aquatic and terrestrial wildlife including at least 87 species of fish, 28 species of amphibians, and 11 species of freshwater molluscs. Several of these species are currently threatened or endangered.

Population and Land Use Characteristics

More than 600,000 people live in the Georgia portion of the basin. The major population centers include bedroom communities of metropolitan Atlanta, as well as Rome and Dalton. The population is expected to increase slowly over the next several decades at a rate of almost 1 percent per year.

More than 75 percent of the basin is covered by forests, including large areas of National Forest, 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 Coosa basin includes part or all of 20 Georgia counties. These counties are members of four different Regional Development Centers. There are also 132 incorporated municipalities in the basin.

Water Quantity Conditions

Surface water supplies in the basin include water in rivers, ponds, and reservoirs. 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. The headwaters area of the Coosa basin provides the second most used source for drinking water in the state of Georgia, supplying over 725,000 people. Georgia's Drinking Water Program oversees 48 active and permitted public water systems in the Coosa River basin.

The primary demands for water supply in the basin include municipal and industrial use, agricultural use, power generation, and recreation. The demand for drinking water is expected to increase due to growth in the metropolitan Atlanta area as well as from the construction of many retirement and secondary homes in the north Georgia area. The total municipal and industrial demand, however, is expected to decrease due to increases in efficiency of use and lower water demand from industry. Agricultural water demand is expected to continue to increase only gradually over the next several decades. Water supplies in the basin are expected to be adequate to meet demands.

Water Quality Conditions

The major environmental stressors that impair or threaten water quality in the Coosa 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, combined sewer overflows, and storm sewers; 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 runoff and rural nonpoint sources are now the major sources of failure to support designated uses of water bodies in the Coosa 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 16 permitted major municipal wastewater discharges with flows greater than 1 MGD in the Coosa River basin. There are also 13

minor public discharges. EPD monitors compliance of these permits and takes appropriate enforcement action for violations. As of the 1996-1997 water quality assessment, 3 stream segments (totaling 38 miles) were identified in which municipal discharges contributed to a failure to support designated uses. Water quality standards violations in these segments are being addressed through the NPDES permitting process.

Industrial discharges. There are relatively few industrial wastewater dischargers in the basin including 7 major facilities. EPD identified 3 stream segments (totaling 5 miles) where permitted industrial discharges contributed to a failure to support designated uses. These segments are currently being addressed through the NPDES permitting process.

Combined sewer overflows. Combined sewers mix sanitary waste and storm water and may discharge untreated waste during wet weather. In response to the 1990 session of the Georgia Legislature requiring the elimination or treatment of all combined sewer overflows (CSOs), the two cities with CSOs in the Coosa River basin (the City of Rome and the City of Cedartown) recently completed the elimination of their CSOs.

Permitted storm water discharges. Urban storm water runoff in the Coosa basin has been identified as a major source of water quality impairment. Urban runoff which is collected by storm sewers is now subject to NPDES permitting and control. EPD has issued 7 municipal separate storm system (MS4) permits in the Coosa basin.

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 Coosa basin indicate that urban and rural nonpoint sources contribute significantly 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 Coosa River basin support or partially support their designated uses. EPD assessed the streams and major lakes in the Coosa basin and reported the results in *Water Quality in Georgia, 1996-1997*. This assessment indicated that 99 out of 178 stream segments (653 miles) fully supported uses, and 28 out of 178 (209 miles) partially supported uses, while 51 out of 178 (392 miles) did not support designated uses. Carters Lake and Lake Allatoona were found to be partially supporting designated uses.

Key Environmental Stressors

The major threats to water quality in the Coosa 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 236 miles, constituting 20 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, mercury) were the second most commonly listed cause of failure to support designated uses. Metals concentrations contributed to lack of full support on 181 miles, constituting 25 stream segments. In most cases, these metals are attributed to nonpoint urban runoff and storm water.

Nutrient loading. Nutrient loading is an important issue for Lake Allatoona and Lake Weiss (downstream 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 Coosa basin are agricultural runoff, urban runoff, storm water, and wastewater treatment facilities.

Fish tissue contamination. Fish consumption guidelines for individual fish species or commercial fishing bans are in effect for 30 stream segments (296 miles). Guidelines for reduced consumption are also in place for large carp and bass on Lake Allatoona and for walleye on Carters Lake. The majority of the guidelines and bans for stream segments are the result of PCB contamination in the area of Rome and downstream. PCBs were released by historical industrial operations in Rome. Although PCBs are no longer used, residuals remain in river and riparian sediments. Elevated levels of mercury are found in tissue of a few fish species in other stream and lake segments. Most of the mercury load is believed to be of natural and atmospheric origin.

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 Coosa 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

At this time, water quantity appears to be adequate for all uses within the Georgia portion of the Coosa basin, and there are no major new water supply projects proposed. There are, however, several water quantity concerns in the Coosa basin which are of significance to decision makers.

One of the major water quantity concerns in the Coosa River basin is the population growth in the counties near Lake Allatoona (i.e., Cherokee, Bartow, Forsyth and Cobb), and the corresponding additional water needs. Water resources within the political boundaries of individual counties in the region may not be sufficient to meet longer-term "in-county" needs; therefore, regional cooperation to develop water supply options will become ever more important to support growth in the region. Interbasin diversion of water to meet the growing needs in the region is another option that will likely get more attention.

ACT/ACF Allocations. Water quantity within the Coosa 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- Coosa-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 Coosa basin in Georgia. It is expected that the allocation will establish some operational requirements for Lakes Allatoona and Carters, including 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. However, it is possible that there may be limitations on quantities of water which will be available for various uses in the Coosa basin.

Sources of water supply to meet the long term needs of the Dalton area have not been decided at this time. Further allocations by the COE of water supply storage within both Carters Lake and Lake Allatoona are uncertain until the ACT/ACF Comprehensive Study is completed and reallocation formulas are agreed upon. Because of the high proportion of industrial uses in the Coosa basin, this constraint causes local governments within the Coosa basin to be concerned about losing the stability and possible growth associated with their cooperation with industry.

Strategies for Water Quality

Water quality in the Coosa 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 Coosa 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 Coosa 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 Coosa 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 Coosa 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, 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 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 Coosa 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.
- **Lake Water Quality Standards**. Georgia law requires comprehensive assessments and standards for major, publicly owned lakes in Georgia. Comprehensive studies of Lakes Allatoona and Carters are ongoing based on EPA Clean Lakes funding. Georgia will initiate the standards setting process for Lakes Allatoona and Carters following completion and approval of the Clean Lakes studies.
- **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 Coosa River basin is a

mixture of livestock and poultry operations and commodity production. About 15 percent of the basin land area is in agricultural use. 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 Coosa basin and commercial forest lands represent over 75 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 Coosa River Basin

This basin plan represents one step in managing the water resources in the Coosa 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 Coosa 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 Coosa River basin plan is planned for mid-summer 2004.

In This Section

Section 1

Introduction

What Is the Purpose of This Plan?

This document presents Georgia's river basin management plan for the Coosa 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 Coosa River basin characteristics, describe the status of water quality and quantity in the Coosa 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. 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 Coosa 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 Coosa River (Figure 1-1). Under the RBMP approach, the Coosa 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 Coosa 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 Coosa 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.

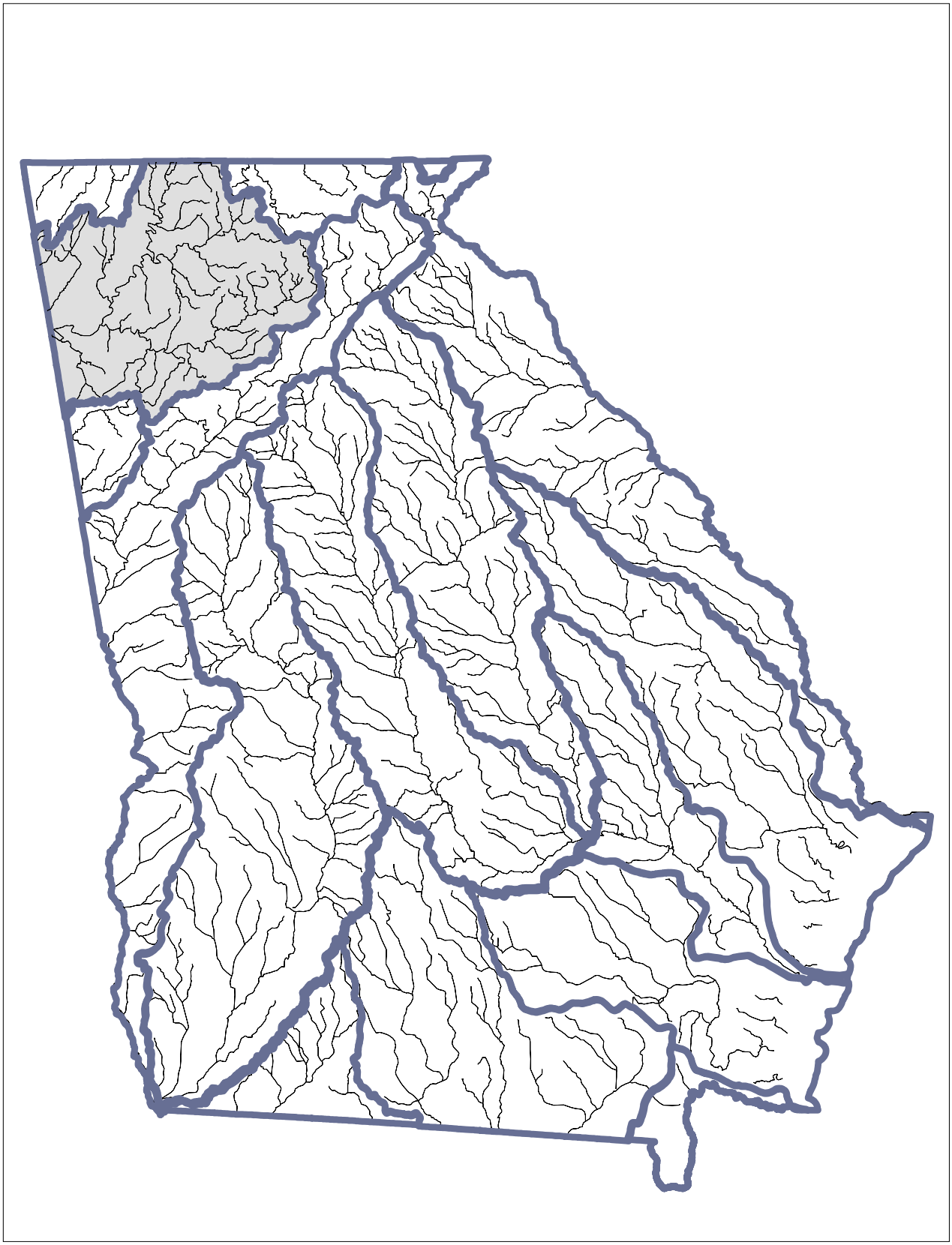


Figure I-1. The Coosa River Basin

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 Coosa River basin. It contains useful information on the health of the Coosa 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 Coosa basin.

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

The schedule of activities for the first two Coosa River basin cycles , i.e., 1993-2000 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 RBMPinfrastructure have caused the first basin cycle to be somewhat condensed. In the Coosa basin, this has meant that there was not as much time available in the first cycle (1993-2000) 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 Coosa basin planning cycle beginning in April of 2000 (and every five years thereafter).

This prolonged implementation phase provides an opportunity for the Coosa 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:

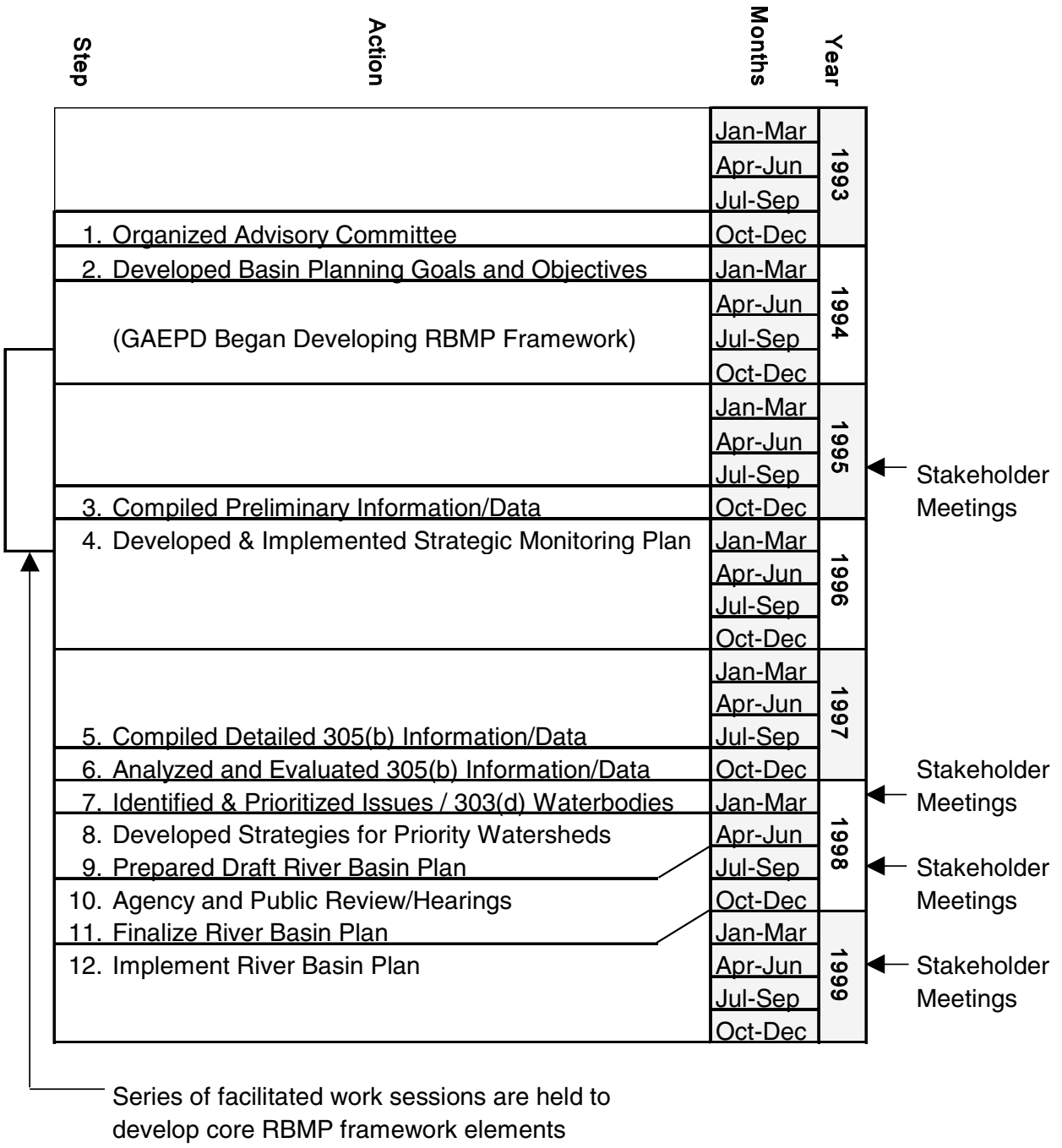


Figure I-2. Coosa River Basin Schedule, Ist Cycle, 1993-1999

Support the Basin Team

Every basin planning cycle begins with the organization of the basin team. The Coosa 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

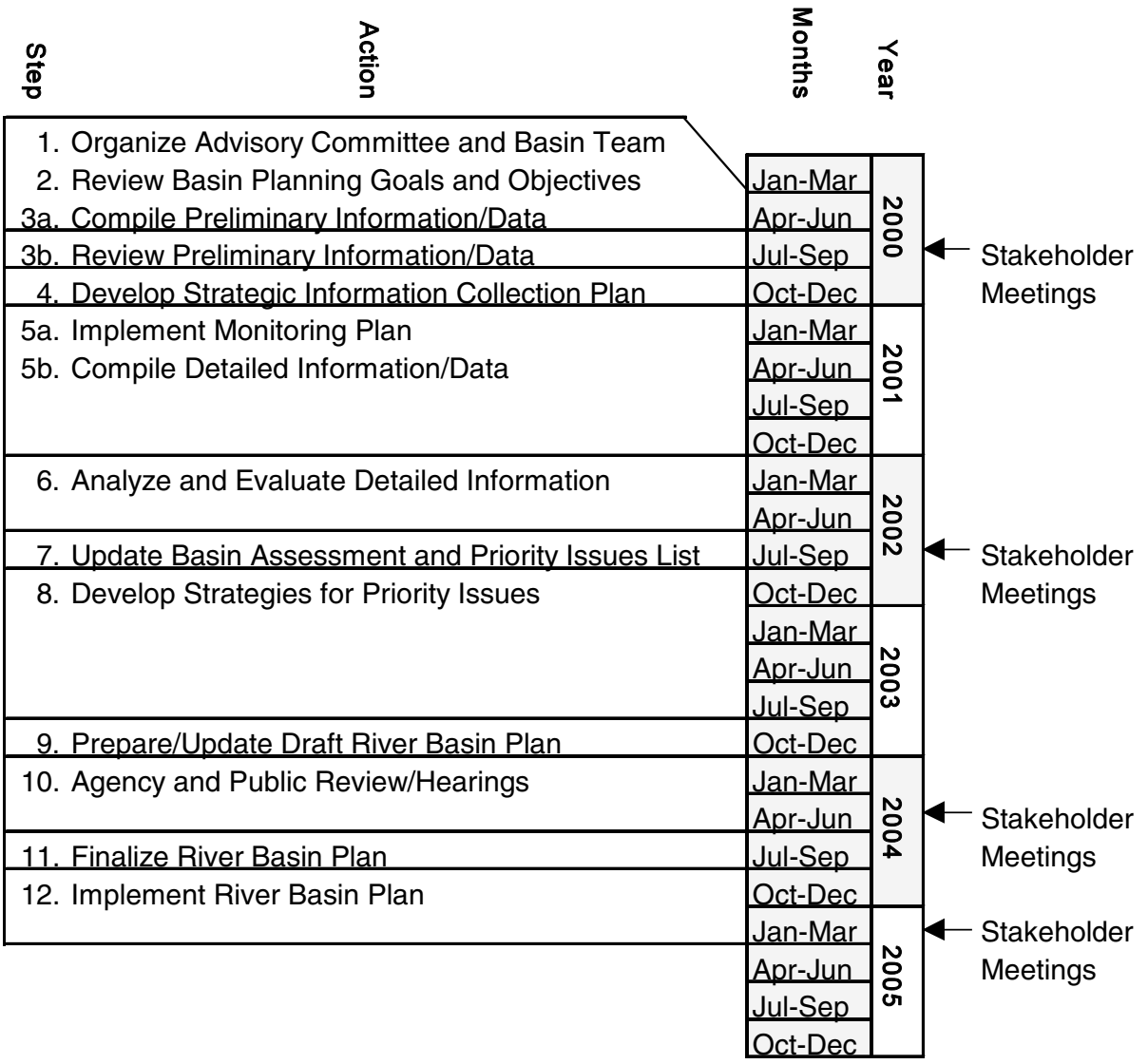


Figure I-3. Coosa River Basin Schedule, 2nd Cycle, 2000-2005

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.

The committees consist of local people representing a variety of stakeholder interests including local governments, agriculture, industry, forestry, environmental groups, land-owners, 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 Coosa River Basin Local Advisory Committee serving for the first planning cycle (1995-1999).

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.

Table I-I. Coosa River Basin Local Advisory Committee Members

Mr. Billy Baker
Division Director
City of Rome
Post Office Box 1711
Rome, GA 30162-1711
770/236-4560

Mr. Bobby Bell
108½ Sycamore Street
Rome, GA 30165
706/234-8006

Mr. Jerry Brown
2887 Alabama Highway
Rome, GA 30165
706/235-0131

Mr. Mike Poley
Resident Brewmaster
Anheuser Busch, Inc.
Post Office Box 200248
Cartersville, GA 30120
770/386-2000

Mr. John Collins
1201 N. Tennessee Road
Cartersville, GA 30120

Kelly Cornwell
Public Works Superintendent
700 West Line Street
Calhoun, GA 30703
706/829-4701

Mr. Bill Evans
Environmental Affairs
Georgia Power Company
Bin 10221
245 Ralph McGill Boulevard, N.E.
Atlanta, GA 30308-3374
404/506-7031

Mr. Phillip Greear
Board for Nature Conservancy
330 Mount Alto Road
Rome, GA 30165-4148
706/234-0954

R. Jayanth Manay
Vice President-Technical Director
Astro Dye Works, Inc.
Calhoun, GA 30701
770/629-2224

Mr. Paul Molla
Resource Manager
U.S. Army Corps of Engineers
(Carters Lake)
Post Office Box 96
Oakman, GA 30732
708/334-2248

Mr. Robert Neel
61 Aubrey Road, NE
White, GA 30184
770/382-3400

Mr. Tom Ritch
Inland Container Corporation
Post Office Box 100
Coosa, GA 30129
706/232-0851

Mr. Dennis Scudder
297 West Junction Court
Kennesaw, GA 30144
770/926-8936

Ms. Nancy Smith
1825 Martha Berrh Boulevard
Rome, GA 30165
706/236-6304

Mr. James Stafford
Water/Sewer Superintendent
Post Office Box 1390
Cartersville, GA 30120
770/387-5653

Figures 1-2 and 1-3 show the timing of stakeholder meetings that have been and will be held as part of the Coosa basin RBMP cycles. The first two groups of stakeholder meetings have already been held for the current planning cycle. EPD hosted initial stakeholder meetings at Cartersville, Dalton and Rome in July, 1995 to invite and encourage stakeholder input early in the planning process for the Coosa River basin. Second stakeholder meetings were held at Dalton and Rome 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—is planned for the "fall" of 1998. A fourth group of meetings in 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 RBMP in the Coosa basin. The dates of ensuing stakeholder meetings are indicated in Figure 1-3.

What's Next?

This plan was reviewed by governmental partners, the Coosa 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 following major characteristics of the Coosa River basin:

- *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 that might affect 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 best 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 Coosa River basin.

The physical characteristics of the Coosa River basin include its location, physiography, soils, climate, surface water and ground water resources, and natural water quality. These physical characteristics influence the basin's biological habitats and the ways people use the basin's land and water resources.

2.1.1 River Basin Boundaries

The Coosa River and its tributary streams occupy most of the northwest corner of Georgia (Figure 2-1). Downstream of Georgia, the Coosa extends through northeast Alabama. The Coosa River basin or watershed, comprising all land areas draining into the river above the confluence with the Tallapoosa River near Wetumpka, Alabama, occupies a total area of about 10,059 square miles, of which 4,579 square miles (46 percent) lie in Georgia, 5,353 square miles (53 percent) lie in Alabama, and 127 square

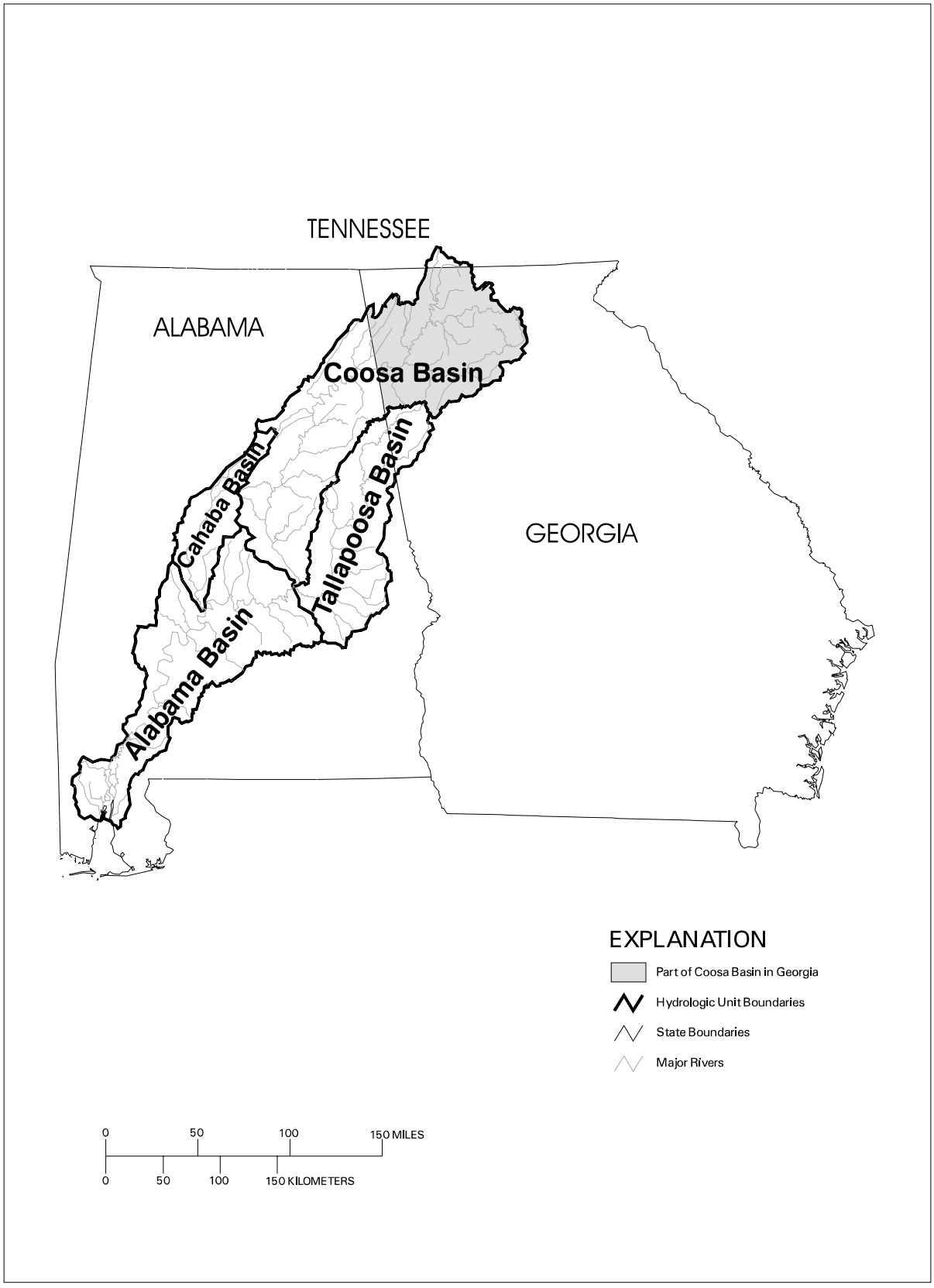


Figure 2-I. Location of the Coosa River Basin

miles (1 percent) lie in Tennessee (referred to by Tennessee as the Conasauga and Coahulla River basin). Water resources within the Coosa 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 Georgia portion of the Coosa basin into five subbasins, or Hydrologic Unit Codes (HUCs; see Table 2-1). These HUCs are referred to repeatedly in this report to distinguish conditions in different parts of the Coosa River basin. Figure 2-2 shows the location of these subbasins and the associated counties within each subbasin.

Table 2-I. Hydrologic Unit Codes (HUCs) of the Coosa River Basin in Georgia

03150101	Conasauga River Basin
03150102	Coosawattee River Basin
03150103	Oostanaula River Basin
03150104	Etowah River Basin
03150105	Mainstem Coosa below Rome and Chattooga River Basin

2.1.2 Climate

The Coosa River basin is characterized by a moist and temperate climate. Mean annual precipitation ranges from 52 to 64 inches. Precipitation chiefly occurs as rainfall, and to a lesser extent, as snowfall. Rainfall is fairly evenly distributed throughout the year, but a distinct dry season usually occurs from mid-summer to late fall. Winter is the wettest season and March the wettest month, on average. The mean annual temperature is about 60 degrees Fahrenheit (Robinson et al., 1996).

2.1.3 Physiography, Geology, and Soils

The Coosa River basin within Georgia contains parts of the Cumberland Plateau, Valley and Ridge, Blue Ridge, and Piedmont physiographic provinces, which extend throughout the southeastern United States. The bulk of the basin lies within the Cumberland Plateau and Piedmont provinces. Similar to much of the upland Southeast, the basin's physiography reflects a geologic history of mountain building in the Appalachian Mountains (Robinson et al., 1996).

The Cumberland Plateau province is dominated by relatively flat plateaus ranging in altitude from 1,500 to 1,800 feet that bound narrow, northeast-southwest-trending linear valleys.

The Valley and Ridge province consists of relatively narrow, northeast-trending linear ridges at altitudes ranging from about 600 to 1,600 feet. Intervening streams drain relatively wide valleys.

The Blue Ridge province is dominated by mountains as high as about 4,100 feet above sea level. Land-surface altitude of intermountain plateaus within the province ranges from about 1,600 to 1,700 feet. The Blue Ridge is distinguished from the Piedmont Province chiefly by its greater topographic relief (Clark and Zisa, 1976).

The Piedmont province is a well-dissected upland characterized by rounded interstream areas to the north and rolling topography further south. Prominent

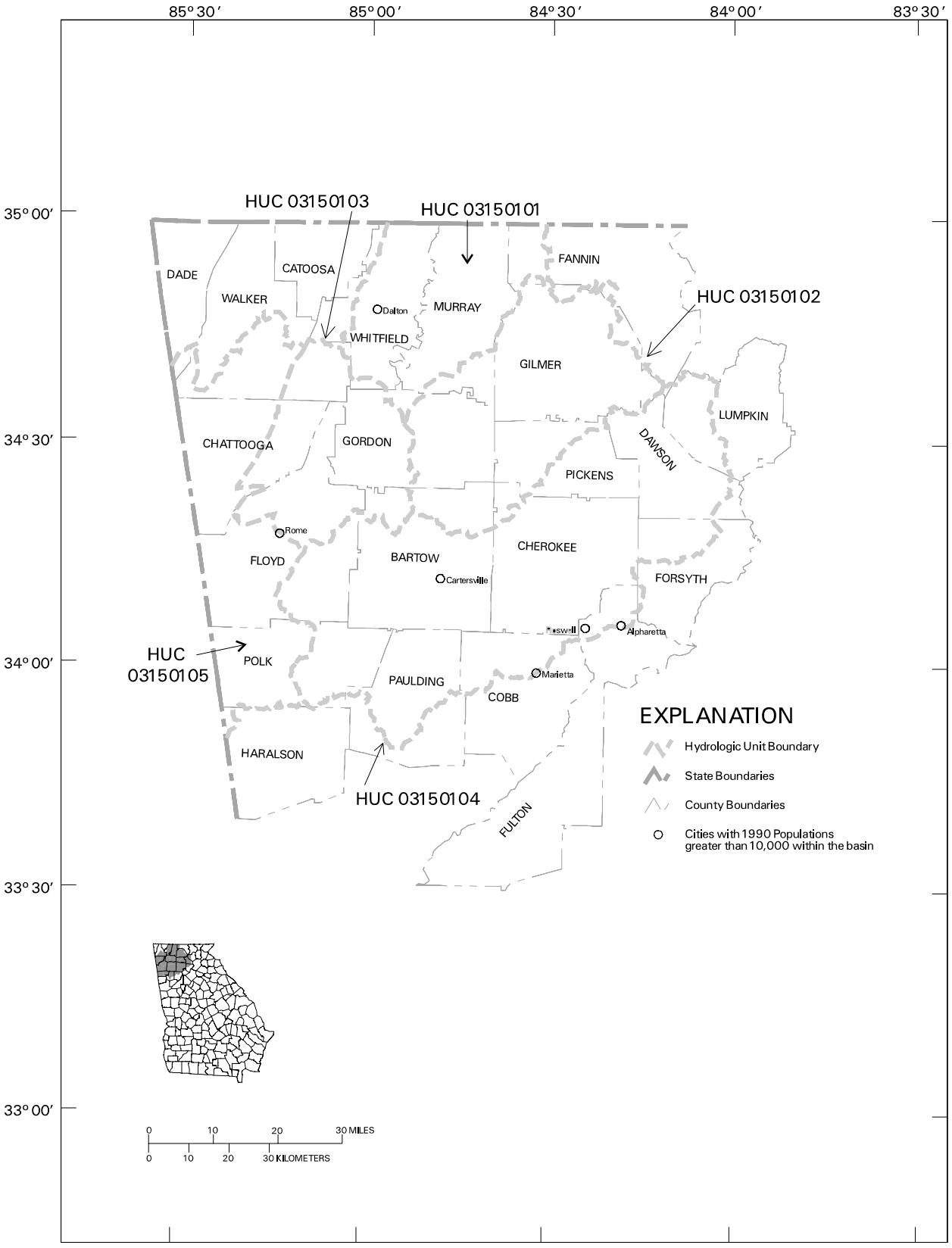


Figure 2-2. Hydrologic Units and Counties of the Coosa River Basin

topographic features generally reflect the erosional and weathering resistance of various rock formations. Altitude ranges from about 550 to 1,500 feet above sea level.

Geology

The geology of the Coosa River basin strongly influences its physiography, geochemistry, soils, and surface and ground water resources. The Coosa River basin in Georgia is underlain by a diverse and complex geology which is generally aligned with the physiographic provinces. The discussion presented here is adapted from Robinson et al. (1996).

Geology of the Blue Ridge and Piedmont Provinces

The Blue Ridge and Piedmont provinces are characterized by complex sequences of igneous rocks of Precambrian to Paleozoic age, and metamorphic rocks of late Precambrian to Permian age (Miller, 1990); in the Piedmont, isolated igneous rocks of Mesozoic age are also present. Collectively, these rocks are called crystalline rocks. 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 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. The Piedmont contains major fault zones that generally trend northeast-southwest and form the boundaries between major rock groups (Georgia Geologic Survey, 1976).

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 ft, 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. Regolith thickness generally is less in the Blue Ridge province than in the Piedmont because of the steeper slopes. 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.

Geology of the Valley, Ridge, and Cumberland Plateau Provinces

Rocks of Paleozoic age characterize the Valley and Ridge and Cumberland Plateau provinces. These rocks are folded, faulted, and thrusted clastic and carbonate rocks of fluvial and marine origin that have been only locally metamorphosed. The deformation of rocks in the Cumberland Plateau is less intense than those in the Valley and Ridge. Fold axes trend northeast to southwest. Typical rock types include shale, siltstone, sandstone, limestone, and dolostone. Discontinuous quartz sand and gravel beds of Cenozoic age have been deposited in the valley floor of the Coosa River.

Soils

Soils of the Coosa River basin are divided into four major land-resource areas (MLRAs, formerly called soil provinces), which generally reflect the physiographic provinces and are shown in Figure 2-3. About 50 percent of the area is in the Southern Appalachian Ridges and Valleys MLRA, about 25 percent in the Blue Ridge MLRA, 20 percent in the Southern Piedmont MLRA, and 5 percent in the Sand Mountain MLRA.

The Southern Appalachian Ridges and Valleys portion of the Coosa basin is characterized by a series of limestone, sandstone, and shale ridges separated by gentler sloping valleys. Soils are highly variable, ranging from shallow to very deep, and from

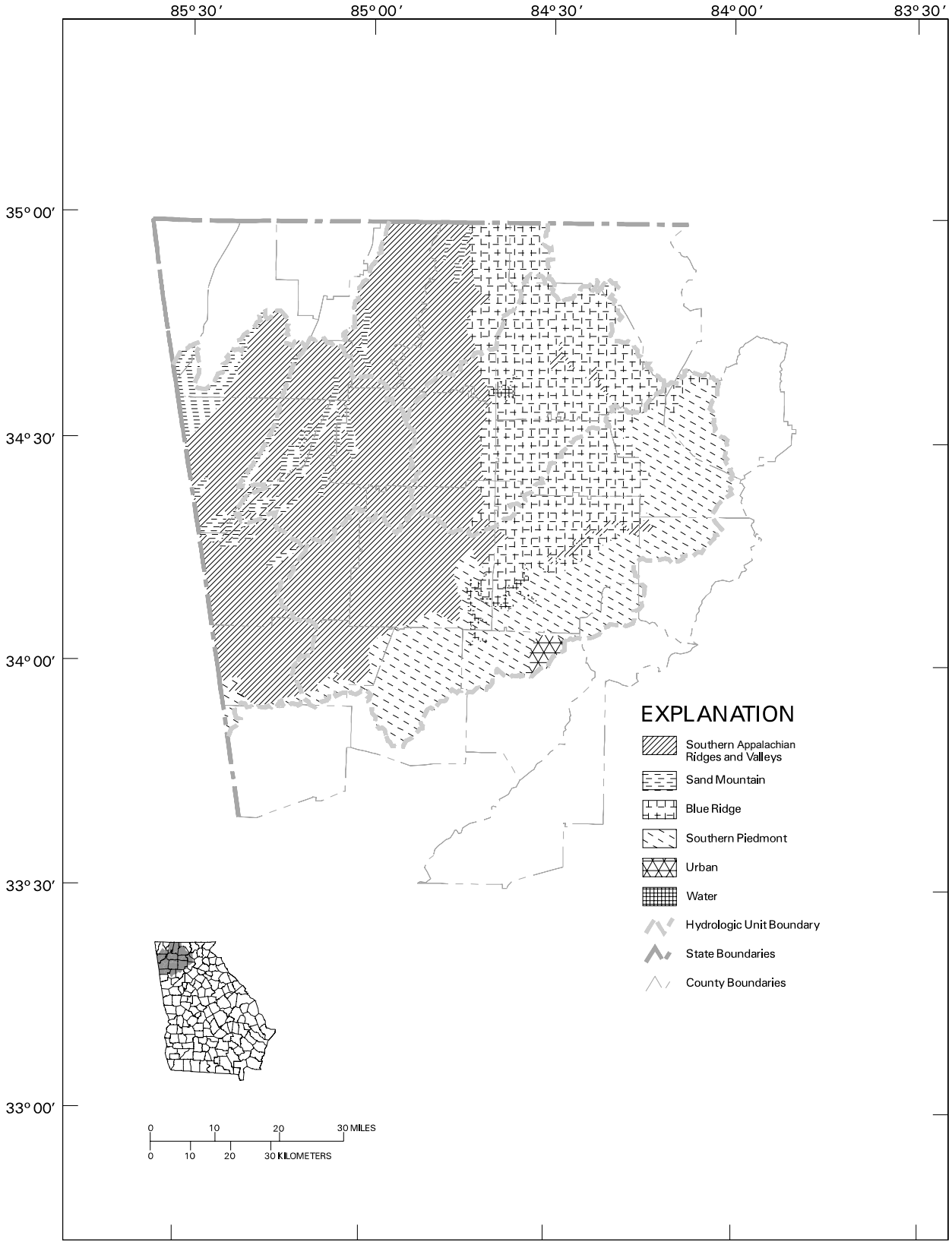


Figure 2-3. Major Land Resource Areas in the Coosa River Basin

clayey to loamy, with varying amounts of rock fragments. Most of the soils have silt loam or gravelly silt loam surface textures. Soils developed on the cherty limestone ridges are primarily very deep and have loamy subsoils with various amount of chert. Soil on the shale ridges normally have clayey subsoils, and vary in content of shale fragments in the soil and in depth to soft shale bedrock. Limestone valleys generally have soils with heavy clay subsoils and are moderately deep over limestone. Flood plains and stream terraces are significant landforms in the regions. Soils on these landforms are very deep, and are dominantly well drained or moderately well drained.

The Blue Ridge portion of the basin is underlain primarily by mica schist, gneiss, quartzite, slate, and conglomerate. Most soils are steep or very steep. Dominant soils have a fine sandy loam or cobbly sandy loam surface layer and a yellowish red loamy subsoil over soft mica schist and phyllite at shallow depths.

The Southern Piedmont portion of the basin is underlain primly by mica schist, biotite, gneiss, and quartzite. Dominant soils have fine sandy loam surface layers and deep red clayey subsoils.

A small portion of the Coosa basin falls within the Sand Mountain MLRA. Soils in this area have fine sandy loam surface textures and loamy subsoils. Soils on the less sloping ridgetops are generally moderately deep. Steeper soils on the side slopes are shallow over sandstone bedrock, and have various amounts of stones and boulders on the surface.

2.1.4 Surface Water Resources

The Coosa River basin contains several major rivers, as well as man-made reservoirs. The Coosa River itself is formed by the confluence of the Oostanuaula and Etowah Rivers near Rome, Georgia. The Oostanuala River in turn is formed by the confluence of the Conasauga and Coosawatee Rivers. The basin also contains the Chattooga River, which joins the Coosa River in Alabama. Each of these rivers is described below. As discussed in Section 2.1.1, the Coosa River basin is subdivided into five Hydrologic Units (HUCs). Stream networks within the Georgia portions of each of these HUCs are shown in Figures 2-4 through 2-8.

Conasauga River

The Conasauga River flows in a northerly direction for about 13 miles from its beginning near Blue Ridge, Georgia. It then flows in a westerly direction 13 miles where it bends, after emerging from the mountains, and flows in a southerly direction for 62 miles. There it joins the Coosawattee River near Resaca, Georgia, and forms the Oostanaula River.

The Conasauga River drains an area of 727 square miles. About 127 square miles are in Tennessee and the remaining area is in Georgia. It has a channel 50 to 150 feet wide with banks 10 feet high along the flood plain. From its source, the river falls at a rate of about 35.5 feet per mile for 41 miles through the mountains. Then it descends at a more gradual slope of about 3 feet per mile for 47 miles to its mouth. Bankfull capacity (the amount of flow the river can carry without overflowing its banks) at Tennga, Georgia is approximately 700 cfs in the upper reaches of the stream. At Tilton, Georgia, bankfull capacity is approximately 4,700 cfs. The largest tributaries are Coahulla Creek with a drainage area of 178 square miles and Jacks River which drains 88 square miles.

Coosawattee River

The Cartecay and Ellijay Rivers form the Coosawattee River at Ellijay, Georgia. It drains an area of 865 square miles. It flows 48 miles from its source, in a generally

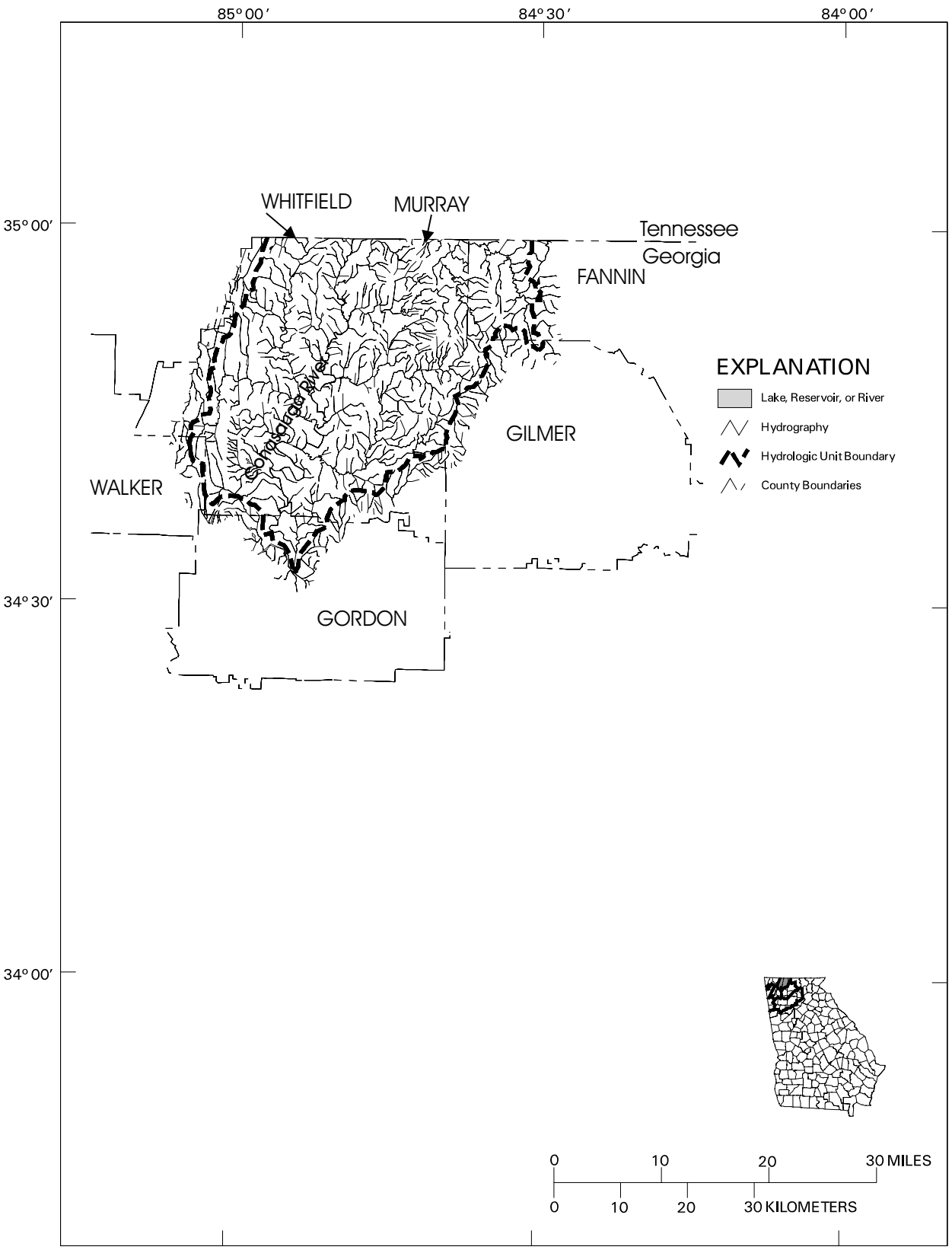


Figure 2-4. Hydrography, Coosa River Basin, HUC 03150101 (Conasauga River Basin)

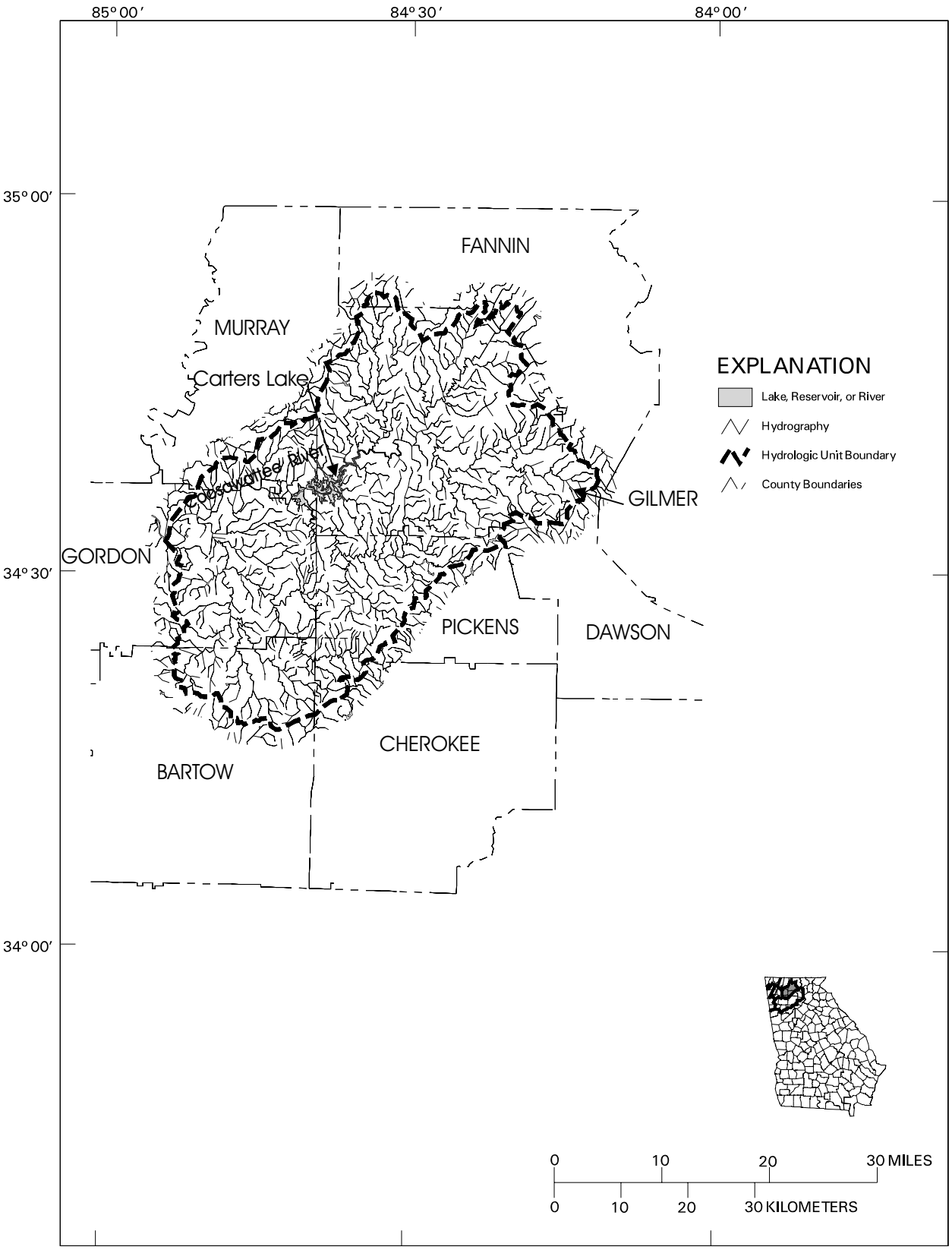


Figure 2-5. Hydrography, Coosa River Basin, HUC 03150102 (Coosawattee River Basin)

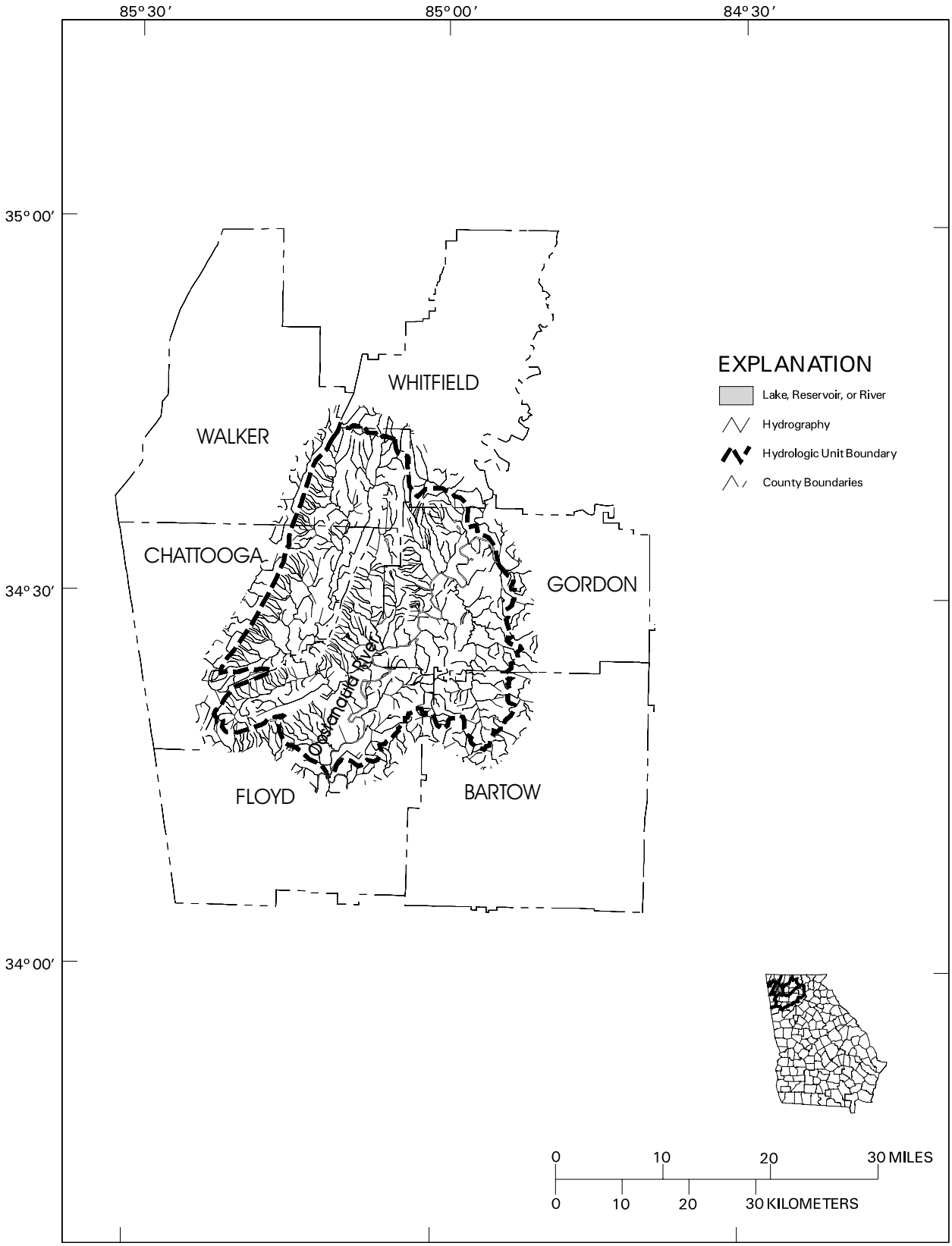


Figure 2-6. Hydrography, Coosa River Basin, HUC 03150103 (Oostanaula River Basin)

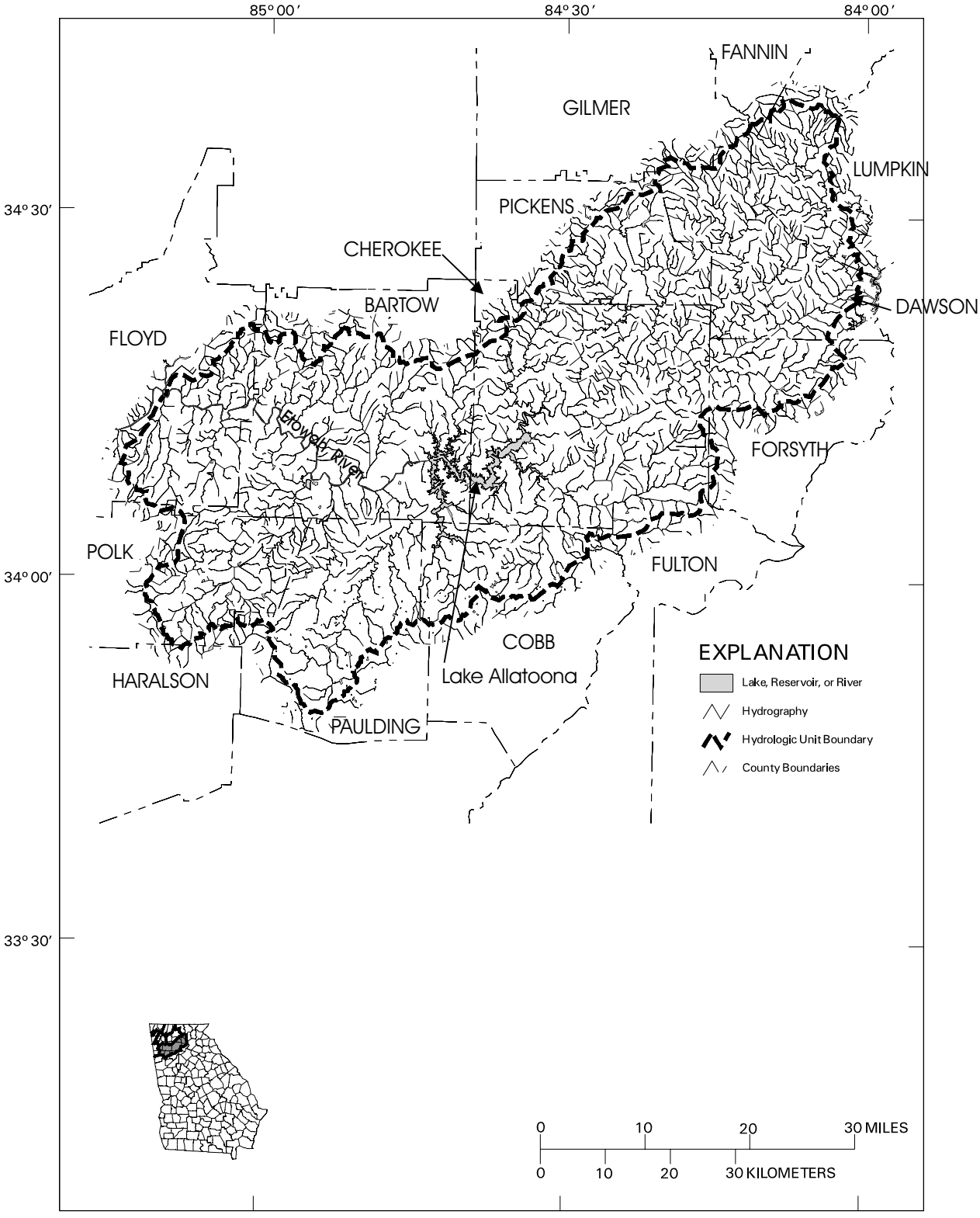


Figure 2-7. Hydrography, Coosa River Basin, HUC 03150104 (Etowah River Basin)

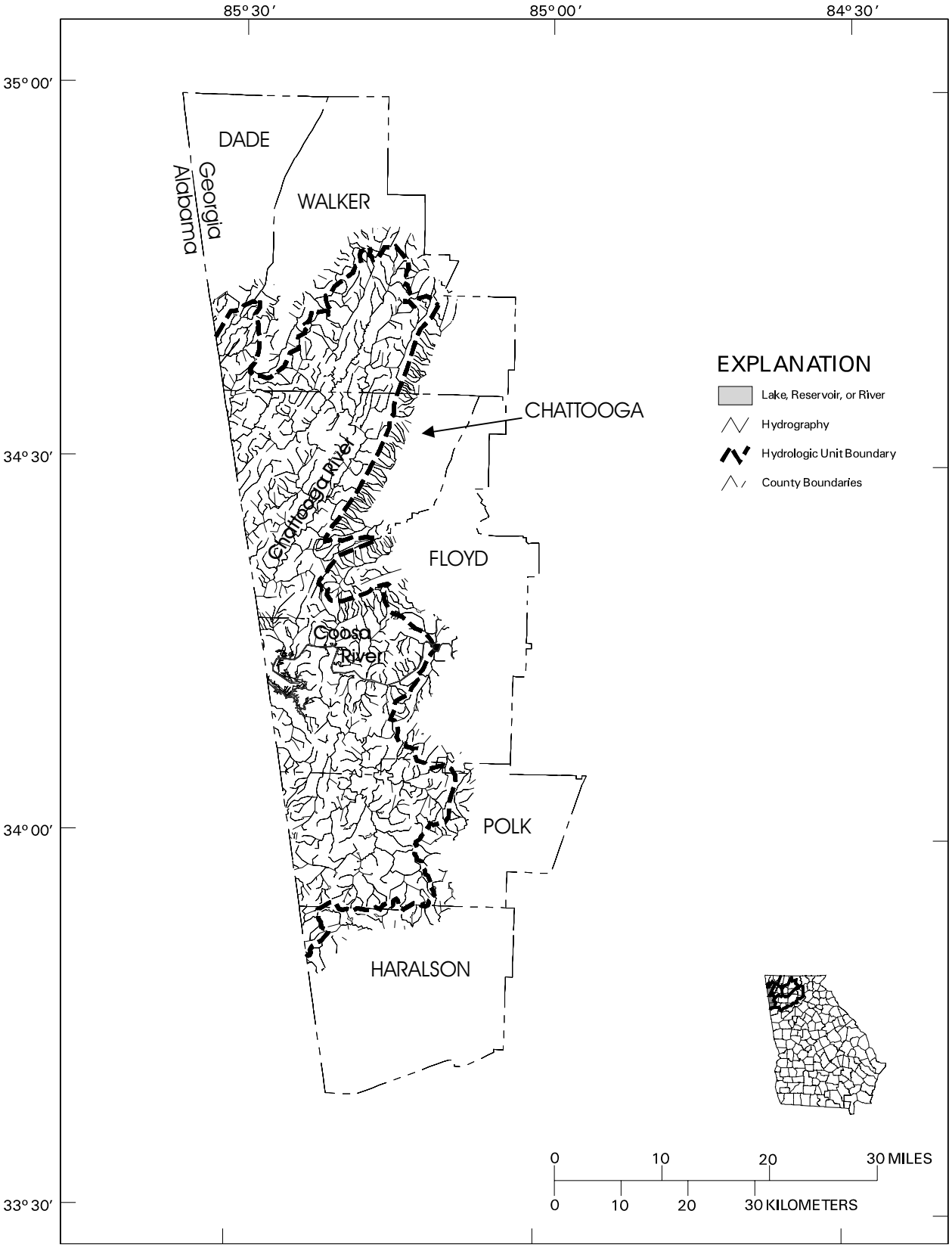


Figure 2-8. Hydrography, Coosa River Basin, HUC 03150105 (Coosa below Rome and Chattooga River Basin)

westward direction, to its juncture with the Conasauga River. The Coosawattee begins its descent at a relatively moderate rate of about 10 feet per mile for two miles. Then it drops 552 feet in the next 19 miles to the escarpment of the mountains, for an average fall of 29 feet per mile. In the lower 27 miles below the mountains to its mouth, the river has a total fall of 50 feet or an average of nearly two feet per mile. The channel, which varies in width from 120 to 150 feet, has banks that are 10 feet high in areas subject to flooding. Near the source of the river at Ellijay, bankfull capacity is approximately 3,500 cfs. Bankfull capacity is approximately 5,000 cfs at Pine Chapel, Georgia, about seven miles above the mouth. Carters Dam is on this stream, 26.8 miles above its mouth. The Carters project has an operating head of about 392 feet. The Carters Reregulation Dam is a short distance downstream, and is designed to moderate the impact of power-generation releases. Sallacoa Creek, with a drainage of 241 square miles, is the largest stream contributing to the Coosawattee River. The headwater streams, Cartecay and Ellijay Rivers, drain areas of 136 and 92 square miles, respectively.

Oostanaula River

The Oostanaula River flows in a southerly direction from its source at the juncture of the Conasauga and Coosawattee Rivers for 47 miles to join the Etowah River at Rome. The Oostanaula basin has an area of 2,150 square miles all of which, except for 140 square miles of the Conasauga River area, are in Georgia. The Oostanaula River has an average width of about 200 feet and banks 15 to 20 feet high. The slope of the river is relatively flat with a fall averaging about one foot per mile. Bankfull capacity at Resaca is approximately 10,000 cfs and is approximately 12,000 cfs at Rome. The largest tributary entering below the Conasauga and Coosawattee Rivers is Armuchee Creek that drains an area of 225 square miles.

Etowah River

The Etowah River begins in the Blue Ridge Mountains near Dahlonega, Georgia, and flows about 150 miles in a southwesterly direction to its confluence with the Oostanaula River at Rome. The basin drains an area of 1,860 square miles in Georgia. The Allatoona Dam is on this river, located about 48 miles above its mouth near Cartersville, Georgia. The Allatoona project has an operating head of about 150 feet. Portions of a small privately owned dam (Thompson and Weinman Dam) remain about four miles downstream from Allatoona Dam. This structure is maintained in accordance to agreements made with the Corps of Engineers and has no effect on streamflow. The river, with banks 25 feet high along the flood plain, varies in width from 100 to 300 feet. From its source, the Etowah River falls at a rate of about 45 feet per mile to the vicinity of Dawsonville. Then it falls 4.5 feet per mile for the next 43 miles to the reservoir of Allatoona Dam. It has an average fall of 3.2 feet per mile in the 48-mile-long reach from the dam to the mouth. Bankfull capacity is approximately 800 cfs at Dawsonville, approximately 3,500 cfs at Canton, approximately 9,200 cfs near Cartersville and approximately 10,000 cfs at Rome. The principal streams contributing to the Etowah River are the Little River of Georgia which drains a 210-square-mile area, and Euharlee, Pumpkinvine and Allatoona Creeks.

Coosa River

The Coosa River, from its beginning at the juncture of the Oostanaula and Etowah Rivers at Rome, flows in a westward direction for 30 miles into Alabama before flowing in a southerly direction past Gadsden and Childersburg, joining the Tallapoosa River just south of Wetumpka to form the Alabama River. For the upper reaches of the Coosa River from Rome to Gadsden bankfull flow capacity ranges from about 15,000 cfs to about 50,000 cfs. The total drainage area for the Coosa basin is 10,161 square miles.

Approximately 4,400 square miles are in Georgia and Tennessee with the remaining area in Alabama. The river from its source falls 420 feet in 267 miles in a series of six successive pools to Jordan Dam. The Coosa River channel, about 286 miles long, varies in width from 300 to 500 feet with banks 25 feet in height along the flood plain. The principal tributaries entering the Coosa River below Rome are: Chatooga River, Little River, and Cedar Creek, which flow into Weiss Lake; Big Wills, Terrapin, and Big Canoe Creeks, which flow into H. Neely Henry Lake; Choccolocco Creek, which flows into Logan Martin Lake; Yellowleaf and Waxahatchee Creeks, which flow into Lay Lake; and Weogufka and Hatchet Creeks, which flow into Mitchell Lake.

Flow rates for the Coosa River

The estimated mean annual discharge of the Coosa River at the Georgia-Alabama border is between 6,700 and 8,200 cfs, using values based on mean-annual stream discharge data collected at Coosa River near Rome, Georgia (USGS gage 02397000) and Coosa River at Leesburg, Alabama (USGS gage 02399500), respectively (Robinson et al. 1989). The majority of the flow from the Georgia portion of the Coosa River basin passes the Rome gage. Figure 2-9 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 1,890 cfs in 1988 to 7,240 cfs in 1990 over the last 20 years. The maximum daily average flow observed between 1975 and 1996 was 64,200 cfs on March 18, 1990, while the minimum was 907 cfs on October 14, 1988. Measures of instantaneous peak flows at this station are available since 1897, with maximum peak flow reported of 70,200 cfs on 30 December, 1932 (prior to regulation of the basin). A flood peak of April 1, 1886 is estimated by USGS to have been in excess of 100,000 cfs.

Chattooga River

The Chattooga River, with a total drainage area of the 675 square miles, drains portions of Walker and Chattooga counties in Georgia before entering Lake Weiss in Alabama.

Reservoirs and Dams

Three dams are located within the Georgia portion of the Coosa River basin, while a fourth, the Weiss Dam in Alabama, has an impoundment which extends into Georgia (Figure 2-10, Table 2-2). Modern dam construction in the Coosa basin began in 1914 with the construction of Lay Dam by Alabama Power Company. By 1930 two additional dams had been constructed in Alabama to harness the natural power present at the Fall Line (where the Peidmont meets the Coastal Plain). Within Georgia, multi-purpose projects have been constructed to harness the power potential of headwater streams, beginning with Allatoona Dam, constructed by the Corps of Engineers in 1949 and followed by Carters Dam on the Coosawattee River in 1974. There is also a re-regulation dam below Carters Dam which captures water for pump back and moderates the impacts of hydropower generation flow. Total annual flow in the basin has not been appreciably altered by the system of dams., although storage is used to augment flows during periods of low flow; and daily fluctuations below some reservoirs can be dramatic.

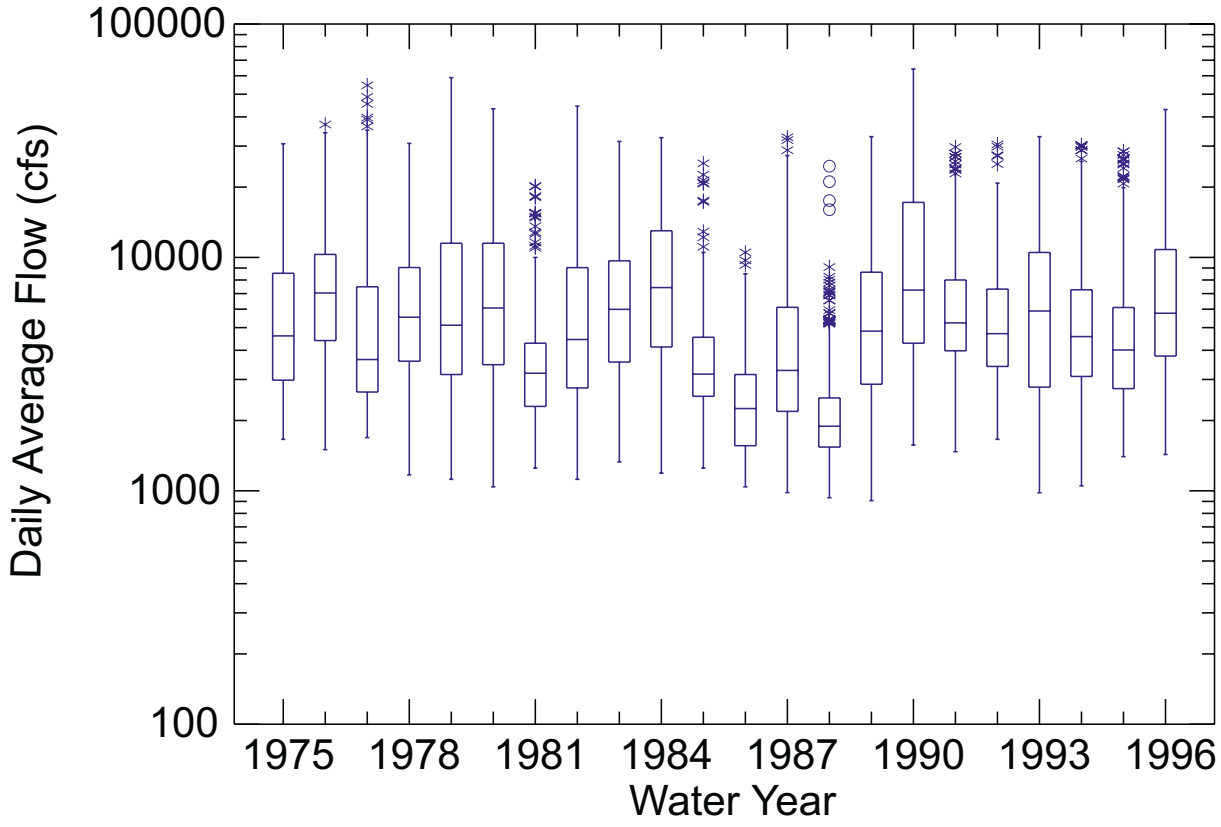


Figure 2-9. Mean Daily Discharge for the Coosa River at Rome (USGS Station 02397000)

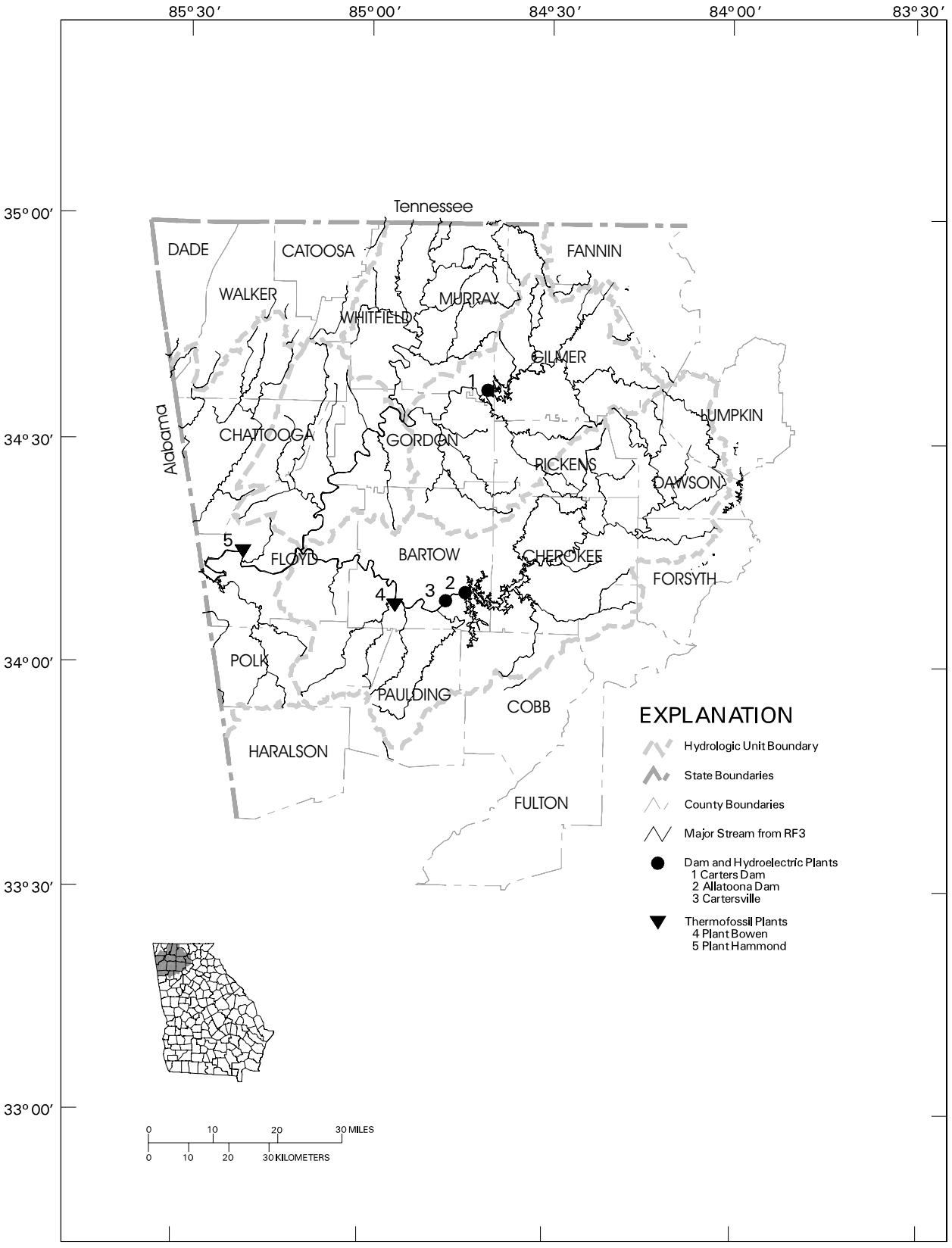


Figure 2-10. Location of Mainstem Dams and Power-Generating Plants in the Coosa River Basin

Table 2-2. Major Dams and Impoundments in the Georgia Portion of the Coosa River Basin

Project Name	Owner Year Initially Completed	Drainage Area (Sq. mi.)	Reservoir Size (Ac)	Reservoir Storage Volume (Ac-Ft)	Total Power Capacity (kW)	Normal Lake Elevation (ft)
Carters Lake and Dam	Corps of Engineers, 1974	376	3,220	383,565	125,000	1,074
Carters Reregulation Dam	Corps of Engineers, 1974	521		19,300	0	700
Allatoona Lake and Dam	Corps of Engineers, 1949	1,110	11,860	670,050	74,400	840
Weiss Lake and Dam	Alabama Power Company, 1961	5,270	30,200	360,400	135,000	564

The major dams and associated impoundments are shown in Table 2-2 and Figure 2-10. The following impoundments have a surface area greater than 500 acres and are considered major lakes:

Carter's Lake

Carters Dam near Redbud, Georgia is located at river mile 63.7 on the Coosawattee River, a tributary of the Oostanaula River in Murry County Georgia and impounds Carter's Lake. Construction was completed in November 1974. It is a storage project with normal operating head of 390 feet and a drainage area of 376 square miles.

Carters Re-regulation Dam near Redbud, Georgia is located at river mile 62.2 on the Coosawattee River, a tributary of the Oostanaula River in Murray County, Georgia. Construction was completed in November 1974. This project provides temporary storage for the generation water from the main dam before some of the discharge is pumped back to the main reservoir. Talking Rock Creek enters the lake adding a drainage area of 145 square miles between the main dam and the re-regulation dam.

Lake Allatoona

Allatoona Dam is located between Cartersville and Canton at river mile 47.8 on the Etowah River. Construction was completed in December 1949 and impounds Lake Allatoona. It is a storage project with normal operating head of 190 feet and a drainage area of 1,110 square miles.

Lake Weiss

Weiss Dam is located on the Coosa River at river mile 225.7 near Leesburg, Cherokee County, Alabama and impounds Lake Weiss. Construction was completed in July 1962. Lake Weiss is a storage project with normal operating head of 53 to 56 feet and a drainage area of 5,270 square miles.

2.1.5 Ground Water Resources

The geology of the Coosa River basin determines the ground water characteristics of the area. Three aquifer systems underlie the Coosa River basin: the Piedmont and Blue Ridge crystalline rock aquifers, the Valley and Ridge and Cumberland Plateau sandstone aquifers, and the Valley and Ridge and Cumberland Plateau carbonate aquifers. The

crystalline rock and sandstone aquifers are fracture-conduit aquifers, while the carbonate aquifers are solution-conduit aquifers. Generalized outcrop areas of major aquifers for the Coosa River basin are shown in Figure 2-11. Ground-water yields from the crystalline rock aquifers tend to be low, but are significant in areas in the Coosa basin which are underlain by carbonate and fractured sandstone aquifers. Brief descriptions of the aquifer systems, adapted from Robinson et al. (1996), are presented below.

Crystalline rock aquifers

Crystalline rock aquifers of the Blue Ridge and Piedmont provinces occur as fracture-conduit aquifers in igneous and metamorphic rocks. Two general water-bearing zones comprise the groundwater flow system in fracture-conduit aquifers: (1) the shallow regolith, consisting of saprolite, soil, colluvium, and alluvium; and (2) the deeper, fractured bedrock. The soil and alluvium of the regolith has the characteristics of a porous-media aquifer, but generally grades downward into a highly weathered, clay-rich, relatively impermeable zone that overlies a less-weathered and more permeable transition zone (Heath,1989). Porosity of the regolith can range from 20 to 30 percent.

In fracture-conduit aquifers, nearly all ground-water movement is through fractured or broken rock and through openings between cleavage planes. Secondary porosity is created by faulting and fracturing and is enhanced by weathering along these openings. The bedrock below the weathered zone and beyond fractures typically has little or no porosity. Ground-water storage primarily is in the overlying weathered rock. The volume of water in storage is controlled by the porosity and thickness of the regolith, which is thicker in marble, schist, and gneiss, and in valleys (Kidd, 1989); 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.

Within the crystalline rock aquifers well yields are variable, due to local and discontinuous properties, but water quality is generally good. Yields of 1 to 25 gallons per minute are typical of wells, but some wells in this aquifer system may exceed 500 gallons per minute yield.

Sandstone aquifers

Sandstone aquifers of the Valley and Ridge and Cumberland Plateau provinces also occur as fracture-conduit aquifers. These aquifers share many of the properties of the crystalline rock aquifers, with the volume of water in storage generally controlled by the porosity and thickness of the overlying weathered surfaces. Well yields range from 10 to 200 gallons per minute (Bossong, 1989). Fracture-conduit aquifers formed in shale, siltstone, and sandstone of the Valley and Ride and Cumberland Plateau provinces may yield quantities of water suitable for public or industrial supply. Most public water-supply wells in the sandstone aquifers of the Coosa basin yield less than 100 gallons per minute.

Carbonate aquifers

Carbonate aquifers of the Valley and Ridge and Cumberland Plateau provinces occur as solution conduits in well-cemented carbonate rocks. These carbonate rocks have little primary porosity or permeability. Secondary porosity features, such as solution-enlarged fractures and bedding planes, form a system of interconnected conduits through which water moves (Bossong, 1989). The weathered zone above many of the carbonate-rock

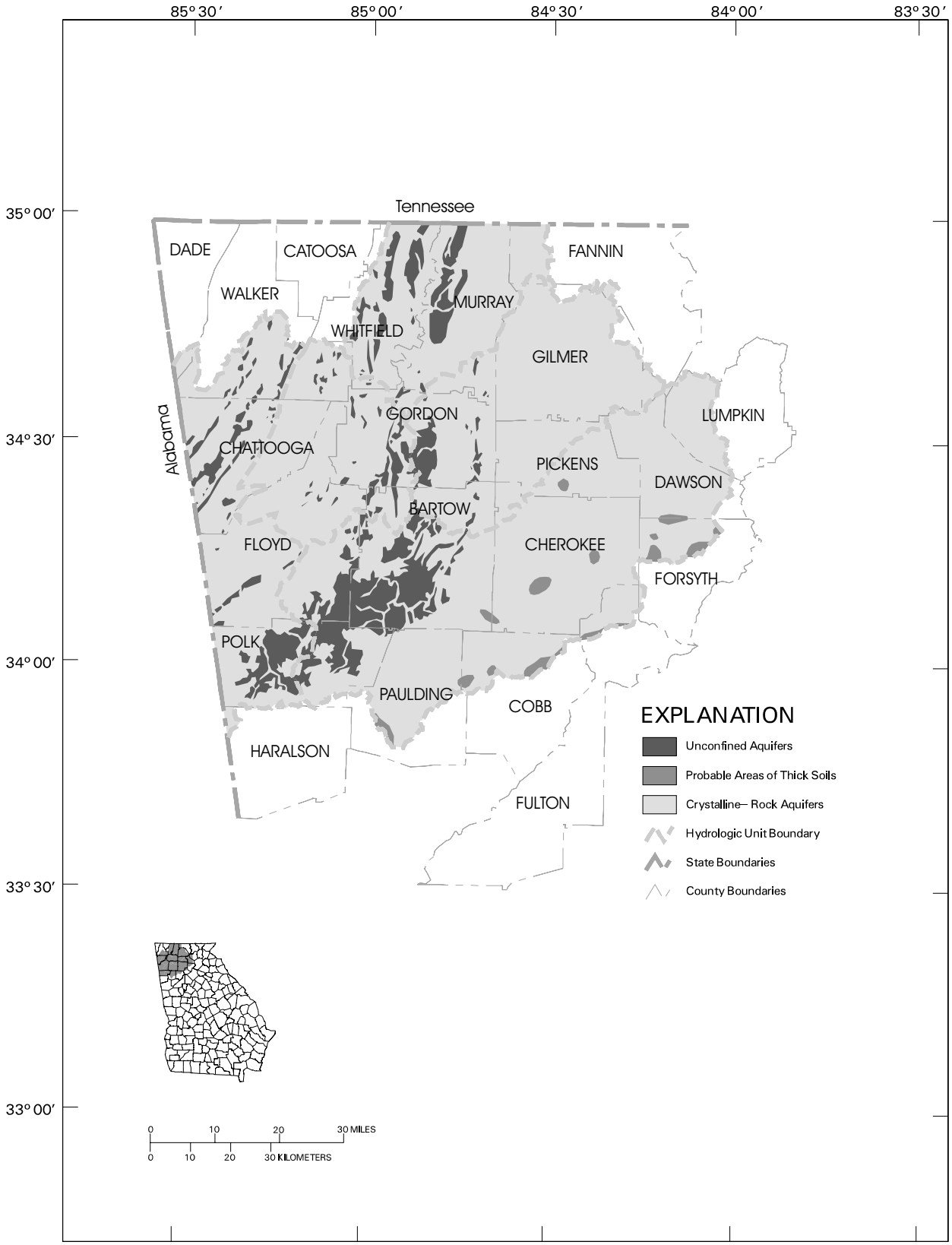


Figure 2-11. Hydrogeologic Units Underlying the Coosa River Basin

aquifers contains a layer of chert rubble that stores and transmits water slowly to the underlying aquifer. The carbonate-rock aquifers exhibit preferential flow directions (anisotropy) because of the local and discontinuous nature of water-bearing units in the bedrock.

The solution-conduit aquifers are widely used for public water supply, although the water may have high concentrations of calcium and bicarbonate. Wells completed in solution-conduit aquifers may supply several thousand gallons of water per minute. Wells that do not intercept secondary porosity zones will, however, seldom supply more that 10 gallons per minute or may be dry. Most public water-supply wells completed in solution-conduit aquifers in the Coosa Basin yield 350 to 700 gallons per minute (Bossong, 1989). As in any solution-conduit aquifer system, ground-water withdrawal and consequent water-level declines potentially induce sinkhole development. Because water can flow rapidly through large conduits, solution-conduit aquifers are also susceptible to contamination from land surface and surface water sources.

Ground Water/Surface Water Interactions

Ground water and surface water have important interactions in the Coosa River basin. Streamflow is composed of two major components: overland or surface runoff, and baseflow, representing ground-water discharge to the stream during dry periods. Robinson et al. (1996) estimate that mean annual baseflow river in the Coosa River and tributaries at the Georgia-Alabama state line is about 4,600 cfs, or about 58 to 64 percent of the mean annual stream discharge. During drought periods this contribution may be greatly reduced; the estimated baseflow discharge at the state line during the drought of 1941 was only 990 cfs. Analysis of Georgia stream gage records (Robinson et al., 1996) indicates that unit-area mean annual baseflow varies considerably, ranging from 1.46 cubic feet per second per square mile for the Etowah River at Canton, Georgia (USGS gage 02392000, with aquifers predominantly fracture-conduit type in igneous and metamorphic rock) to 0.775 cubic foot per second per square mile for Cedar Creek near Cedartown, Georgia (USGS gage 02397500, with aquifers predominantly solution-conduit type in carbonate rocks).

2.1.6 Biological Resources

The Coosa 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. The basin encompasses parts of four major land resource areas, with a wide range of elevations and slopes, providing many different habitat types. Large portions of the basin are managed as part of the Chattahoochee National Forest, which includes a number of wilderness and wildlife management areas. 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 Coosa 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 in the Piedmont regions.

Prior to European settlement, the Coosa River basin was mostly forested. Historically, the Blue Ridge province was covered by oak-chestnut-hickory forests, with hemlock in moist coves and white pine in drier ridges. Chestnut was extirpated from these forests as a result of the Chestnut Blight. Native forests in the Piedmont province were dominantly deciduous hardwoods and mixed stands of pine and hardwoods.

Cumberland Plateau Region

The northwest part of the Coosa River basin includes the Cumberland Plateau region. Streamside forests in this region are often associated with deep gorges and steep slopes. Typical species of the slopes and ravines bordering streams in this region include *Quercus rubra, Q. prinus, Ostrya virginiana, Fagus grandifolia, Carya ovata, C. glabra, C. tomentosa, Celtis occidentalis, Platanus occidentalis, Carpinus caroliniana, Acer negundo, A. rubrum, Rhododendron arborescens, Kalmia latifolia, Ilex opaca, I. verticillata*, and *Asimina triloba*. Upland sag ponds and sinks occur on top of Lookout and Pigeon mountains, and provide habitat for interesting combinations of mesic and xeric species, such as *Quercus prinus, Nyssa sylvatica, Acer rubrum*, and *Salix nigra.* Bottomland forests of the Cumberland Plateau region are similar to those of the Blue Ridge region, but contain some hardwood species such as *Quercus phellos, Q. michauxii, Q. nigra*, and *Q. shumardii* which are absent from the Blue Ridge-Cohutta mountains. Species found in bottomland areas such as The Pocket at Pigeon Mountain include *Quercus alba, Q. velutina, Acer rubrum, A. saccharum, Aesculus octandra, Tilia heterophylla, Sassafras albidum, Carya ovata, C. glabra, Robinia pseudoacacia, Prunus serotina, Carpinus caroliniana, Fraxinus americana, Halesia carolina*, and *Cercis canadensis*.

Valley and Ridge Region

The Valley and Ridge (Great Appalachian Valley) region includes the Chickamauga Valley, Armuchee Ridges, and Great Valley districts. It is bounded on the east by the Cartersville Fault, and on the west by the Lookout-Pigeon Mountain escarpment. Bottomland forests in this area are associated with streams of the Alabama drainage, except for the upper part of the Chickamauga Valley, which drains into the Tennessee system. Typical species of these forests include *Quercus phellos, Aesculus octandra, Acer negundo, Ostrya virginiana, Fagus grandifolia, Carpinus caroliniana, Nyssa sylvatica, Ulmus rubra,* and *Prunus serotina.*

The Great Valley District represents a major portion of Georgia's section of the Coosa River floodplain, whose drainage system extends into the Coastal Plain of Alabama. This area represents a rather unique river/floodplain forest system with many Coastal Plain elements, including *Cornus stricta, Acer floridanum,* and *Carya aquatica* (Wharton, 1978). The Great Valley District also contains the highest concentration of sagponds in northwest Georgia. These fluctuating-water habitats are connected by dendritic drainage patterns during the wetter parts of the year. Sagponds contain many plants common to the Coastal Plain, including *Ilex glabra* and *Quercus laurifolia.* Trees and shrubs bordering sagponds may include *Acer rubrum, Quercus phellos, Q. falcata, Nyssa biflora, Lyonia lucida, Cephalanthus occidentalis, Cornus florida,* and *Itea virginica*.

Blue Ridge Region

The Blue Ridge habitat region includes the Cohutta and Blue Ridge mountain districts, and the McCaysville Basin District. The Talladega Upland and Sharp Top-Pine Log mountain regions (see Pehl and Brim, 1985), while physiographically and geologically related, are considered part of the Upper Piedmont region below.

Streams in this region comprise the headwaters of major alluvial rivers of the Piedmont. Blue Ridge streams are generally fast-moving and clear, with rocky substrates. These highly oxygenated waters are often fed by springs or seeps. Floodplains are

generally narrow, and are bordered by *Kalmia latifolia, Rhododendron maximum, Tsuga canadensis, Acer rubrum, A. saccharum, Ostrya virginiana, Carpinus caroliniana, Pinus strobus,* and *Alnus serrulata.* Many of the wider floodplains have been cleared and planted.

Forests of the Blue Ridge mountain coves are similarly rich in species to those of the Cumberland Plateau, but harbor several more montane trees such as *Magnolia fraseri, Betula lenta, B. lutea,* and *Tsuga canadensis.* Common species shared with the Cumberland Plateau lower slope forests include *Aesculus octandra, Tilia heterophylla, Liriodendron tulipifera, Magnolia acuminata, Magnolia tripetala, Carya cordiformis, C. tomentosa, C. glabra, Quercus rubra, O. alba, Acer rubrum, A. negundo, A. saccharum, A. saccharinum, Platanus occidentalis, Salix nigra, Carpinus caroliniana, Ostrya virginiana,* and *Liquidambar styraciflua.*

Upper Piedmont Region

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. 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 Coosa 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 riverain ecosystems.

Assessments of wetland resources in Georgia have been carried out with varying degrees of success by the Natural Resources Conservation Service (NRCS), the U.S. Fish and Wildlife Service National Wetland Inventory, and Georgia's Department of Natural Resources. Georgia DNR compiled a wetlands 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 8572 acres or 0.3 percent of land area in the Coosa River basin. These data may 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 fishes, amphibians, aquatic reptiles, and aquatic invertebrates. However, the Coosa 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.

According to Burkhead et al. (1997) the Coosa River and its major tributaries may have had more recent extirpations and extinctions of aquatic organisms than any other

equally-sized river system in the United States. They estimate that the Etowah River has more imperiled fishes and invertebrates than any other river system of similar length in the southeastern United States, and that the Conasauga River has the second highest number of such imperiled species. According to Neves et al. (1997), 26 of 82 species of aquatic gastropods (snails) historically known from the Coosa River Basin are now considered extinct (a 63 percent decline in species diversity).

Fish Fauna

The diverse fish fauna of the Coosa River basin includes 87 species representing 17 families. The largest group of fish species found in the Coosa Basin 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.

Fisheries. There are several lakes within the Coosa River basin that provide excellent habitat for various freshwater fisheries. The Wildlife Resources Division manages Rocky Mountain Public Fishing Area, with 202 and 357 acre lakes in Floyd County. The lakes offer excellent fishing for largemouth bass, bluegill, redear sunfish, channel catfish, black crappie, and hybrid bass.

Carters Lake is a U.S. Army Corps of Engineers reservoir on the Coosawattee River in Murray and Gilmer counties. Impounded in 1975, this oligotrophic mountain reservoir is the deepest in Georgia. The lake has good fisheries for walleye, striped bass, spotted bass, largemouth bass, crappie, and channel catfish.

Lake Allatoona is another U.S. Army Corps of Engineers reservoir on the Etowah River in Bartow, Cherokee and Cobb counties. Impounded in 1949, this 11,860 acre reservoir just north of Atlanta receives heavy recreational use. The lake has good fisheries for crappie, largemouth bass, striped bass, white bass, hybrid bass, channel catfish and flathead catfish.

Below Carters Reservoir, the Coosawattee flows unimpeded for approximately 50 miles to its confluence with the Etowah River. The Etowah, downstream of Lake Allatoona, flows approximately 30 miles to its confluence with the Coosawattee. Together the two rivers form the Coosa River. A significant recreational river fishery exists in the Coosa River. The river has good fisheries for white bass, striped bass, largemouth bass, black crappie, blue, channel, and flathead catfishes, and various sunfish species. The landlocked striped bass population in this section of the Coosa River is unique as it is one of the few in the United States that are naturally reproducing.

Thirteen fish species occurring within the Coosa River basin (as well as a myotis bat) have been listed for protection by Federal or State agencies as endangered, threatened, or rare (Table 2-3). The majority of these species occur in HUC 03150101 (Conasauga drainage) or 03150104 (Etowah).

Amphibians and Reptiles

Twenty-eight documented species of amphibians (14 salamanders and 14 frogs) inhabit the Coosa River basin that require freshwater for all or part of their life cycle (Williamson and Moulis, 1994). Four additional salamanders, the slimy salamander

Table 2-3. Federal and State Protected Aquatic and Wetland Species in the Coosa River Basin

Common Name	Species	Federal Status	State Status	Ranking	Occurrence by HUC				
					03150102	03150103	03150104	03150105
Vertebrate Animals									
Gray Myotis Bat	*Myotis grisescens*	LE	E	Globally imperiled or rare; critically imperiled in state because of extreme rarity.			✔	✔	
Alabama Map Turtle	*Graptemys pulchra*		R	Apparently secure in state.	✔				
Blue Shiner	*Cyprinella caerulea*	LT	E	Globally imperiled because of rarity; imperiled or critically imperiled in state.	✔	✔			
Bluestripe Shiner	*Cyprinella callitaenia*		T	Globally imperiled; critically imperiled in state because of extreme rarity.				✔	
Holiday (Ellijay) Darter	*Etheostoma brevirostrum*		T	Globally imperiled because of rarity; imperiled or critically imperiled in state.	✔	✔		✔	
Coldwater Darter	*Etheostoma ditrema*		T	Imperiled in state because of rarity.	✔				✔
Etowah Darter	*Etheostoma etowahae*	LE	T	Critically imperiled in state because of extreme rarity.				✔	
Cherokee Darter	*Etheostoma scotti*	LT	T	Globally imperiled; imperiled or critically imperiled in state.		✔		✔	
Trispot Darter	*Etheostoma trisella*		T	Imperiled in state because of rarity.	✔	✔	✔		
Bigeye Chub	*Hybopsis amblops*		R	Demonstrably secure in state.	✔			✔	
River Redhorse	*Moxostoma carinatum*		R	Apparently secure in state.	✔				
Frecklebelly Madtom	*Noturus munitus*		E	Rare or uncommon in state.	✔			✔	

Common Name	Species	Federal Status	State Status	Ranking	03150102	03150103	03150104	03150105
					Occurrence by HUC			
Freckled Madtom	*Noturus nocturnus*		E	Globally secure; of historical occurrence in state, not verified in last 20 years.			✔	
Amber Darter	*Percina antesella*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity	✔		✔	
Goldline Darter	*Percina aurolineata*	LT	T	Globally imperiled; critically imperiled in state because of extreme rarity.	✔			
Conasauga Logperch	*Percina jenkinsi*	LE	E	Critically imperiled globally and in state because of extreme rarity	✔			
Freckled Dater	*Percina lenticula*		E	Globally imperiled; critically imperiled in state because of extreme rarity.	✔		✔	
Invertebrate Animals								
Upland Combshell	*Epioblasma metastriata*	LE	E	Globally of historical occurrence; critically endangered in state because of extreme rarity; taxonomy uncertain.	✔			✔
Southern Acornshell	*Epioblasma othcaloogensis*	LE	E	Globally of historical occurrence; critically endangered in state because of extreme rarity, taxonomy uncertain.	✔	✔		✔
Southern Combshell	*Epioblasma penita*	LE		Critically imperiled globally and within state because of extreme rarity.				✔
Fine-lined Pocketbook	*Lampsilis altilis*	LT	T	Thought to be imperiled in state because of rarity.	✔			✔
Alabama Moccasinshell	*Medionidus acutissimus*	LT	T	Critically imperiled globally and in state because of extreme rarity.	✔	✔		✔
Coosa Moccasinshell	*Medionidus parvulus*	LE	E	Imperiled or critically imperiled globally; critically imperiled in state because of extreme rarity.	✔			✔

Common Name	Species	Federal Status	State Status	Ranking	Occurrence by HUC				
						03150102	03150103	03150104	03150105
Gulf Moccasinshell	*Medionidus penicillatus*	PE		Imperiled globally and in state because of rarity.	✔				
Southern Clubshell	*Pleurobema decisum*	LE	E	Globally imperiled or critically imperiled; of historical occurrence in the state.	✔	✔	✔		
Southern Pigtoe	*Pleurobema georgianum*	LE	E	Critically imperiled globally and in state because of extreme rarity.	✔		✔		✔
Ovate Clubshell	*Pleurobema perovatum*	LE	E	Globally critically imperiled because of extreme rarity; of historical occurrence in state.	✔				
Triangular Kidneyshell	*Ptychobranchus greenii*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity.	✔				✔
Plants									
Fraser Loosestrife	*Lysimachia fraseri*		R	Globally imperiled or rare; critically imperiled in state because of extreme rarity.					✔
Coosa Barbara Buttons	*Marshallia mohrii*	LT	T	Globally rare or uncommon; critically imperiled in state because of extreme rarity.					✔
Monkeyface Orchid	*Platanthera integrilabia*		T	Globally imperiled; imperiled or critically imperiled within state.				✔	
Little River Water-Plantain	*Sagittaria secundifolia*	LT	T	Critically imperiled globally and within state because of extreme rarity.					✔
Green Pitcherplant	*Sarracenia oreophila*	LE	E	Globally imperiled; critically imperiled in state because of extreme rarity.		✔			
Tennessee Yellow-eyed Grass	*Xyris tennesseensis*	LE	E	Critically imperiled globally and in state because of extreme rarity.	✔	✔		✔	✔

E: Endangered T: Threatened R: Rare L: Listed P: Proposed

(*Plethodon glutinosus)*, southern red-back salamander (*P. serratus*), Webster's salamander (*P. websteri*), and seepage salamander (*Desmognathus aeneus*), that omit an aquatic life-stage are nevertheless strongly associated with riparian zones of the Coosa River basin and others. Further, five undocumented amphibians, the wood frog (*Rana sylvatica*), green salamander (*Aneides aeneus*), flatwoods salamander (*Ambystoma talpoideum*, mud salamander (*Pseudotriton montanus*), and Alabama waterdog (*Necturus alabamensis*), are quite likely to inhabit this region either due to their occurrence in the adjacent Alabama portions of the Coosa drainage (Mount, 1975) or because they are not considered evolutionarily specific to the Coosa and occur in other nearby drainage basins of Georgia (Jensen, 1996). Of these 37 amphibian species, nine (*Aneides aeneus, Desmognathus aeneus, Eurycea longicauda, E. lucifuga, Hemidactylium scutatum, Necturus alabamensis, Plethodon websteri, Pseudotriton montanus,* and *Rana sylvatica*) are considered of "Special Concern" by the Georgia Natural Heritage Program. *Aneides aeneus* is state listed/protected as "Rare" in Georgia. Additionally, *Eurycea aquatica*, although of questionable validity as a separate species from the southern two-lined salamander (*E. cirrigera*), is nearly endemic to the Coosa River basin and is considered globally imperiled by The Nature Conservancy.

Ten turtle and five snake species comprise the documented reptiles strongly associated with freshwater habitats (Williamson and Moulis, 1994) of the Coosa River basin and others. Two map turtles, the common map turtle (*Graptemys geographica*) and Alabama map turtle (*G. pulchra*), are currently known from nowhere else in Georgia and are therefore state listed/protected as "Rare". Among other things, these two turtles are threatened by the reduction of their molluscan prey resulting from sedimentation and other stream perturbations.

This region of Georgia is unusually rich in both flora and fauna typically associated with the Coastal Plain (Wharton, 1978; Jensen, pers. obs.). Amphibians and reptiles that fit this description include the barking tree frog (*Hyla gratiosa*), flatwoods salamander (*Ambystoma talpoideum*), and cottonmouth (*Agkistrodon piscivorus*).

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 riverain 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). Eleven species of freshwater molluscs native to the Coosa basin are currently listed or proposed for listing as endangered or threatened (Table 2-3).

Several factors have contributed to the decline of freshwater mussels, including their own complicated life-history strategy and the many impacts on riverain habitat. Mussels have a parasitic larval stage 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).

The Nature Conservancy and the U.S. Fish and Wildlife Service are working with other stakeholders to identify ways to protect habitat and improve water quality in the

Conasauga River. Plans are being developed for propagation and reintroduction of endangered and threatened mussels in selected reaches.

Hobbs (1981) lists 15 crayfish species, representing three genera, that occur in the Coosa basin. All four of the ecological groups discussed by Hobbs (stream dwellers, lake pond and ditch inhabitants, the burrowers, and the cave dwellers) are found in the basin.

Aquatic and Wetland Vegetation

Although the Coosa River basin supports a diverse population of upland plants, wetland areas are limited, while lakes and ponds occur only as a result of human activities. The Georgia Natural Heritage Program has identified six "Special Concern" wetland or aquatic plant species occurring in the Coosa River basin that are rare, threatened, or endangered (Table 2-3).

2.2 Population and Land Use

2.2.1 Population

As of 1995 more than 606,000 people lived in the Georgia portion of the Coosa River basin, with more than 26 percent of that population in the two counties of Cherokee and Paulding, bordering the Atlanta metropolitan area (DRI/McGraw-Hill, 1996). Population centers in the Coosa watershed outside the Metropolitan Atlanta area include Rome and Dalton. Population distribution in the basin at the time of the 1990 Census by Census blocks is shown in Figure 2-12. A summary of 1990 population estimates for the Coosa Basin by HUC units based on census tract/block centroids (EPA Geographic Information Query System) for Georgia, Alabama, and Tennessee is shown in Table 2-4.

Between 1975 and 1995, the population in the Coosa River basin increased at a rate of 2.7 percent per year. Although past growth has been strong, a heavy dependence on declining industrial sectors is expected to temper growth in the long term (DRI/McGraw-Hill, 1996). Basin population is projected to increase at a rate of 0.8 percent per year between 1995 and 2050. The largest increases in population are projected for Cherokee, Dawson, Paulding and Pickens Counties, along the southeast edge of the basin in HUC 03150104 (Etowah River basin). The predominantly rural counties in the northern part of Figure 2-12 the basin are projected to have stable or slightly declining populations by this study (DRI/McGraw-Hill, 1996), although the predictions have been questioned by local governments in the area.

2.2.2 Employment

The Georgia portion of the Coosa River basin supported 209,000 jobs in 1990, of which nearly 40 percent were in manufacturing. This market share is expected to shrink dramatically in coming years, and by 2050 manufacturing is expected to account for 12 percent of all jobs in the basin (DRI/McGraw-Hill, 1996). Every manufacturing sector is expected to suffer heavy losses. Between 1990 and 2050, jobs in the dominant textiles sector are predicted to fall at an annual rate of 3.0 percent, eliminating 40,000 of today's 48,000 jobs. Following textiles, the greatest losses are expected to be in durables, which will shrink to half of today's 15,000 jobs. Despite job loss, industrial output is expected to see strong growth due to increasing productivity. Strong job growth is expected in the areas of financial institutions and real estate, services, and government (DRI/McGraw-Hill, 1996).

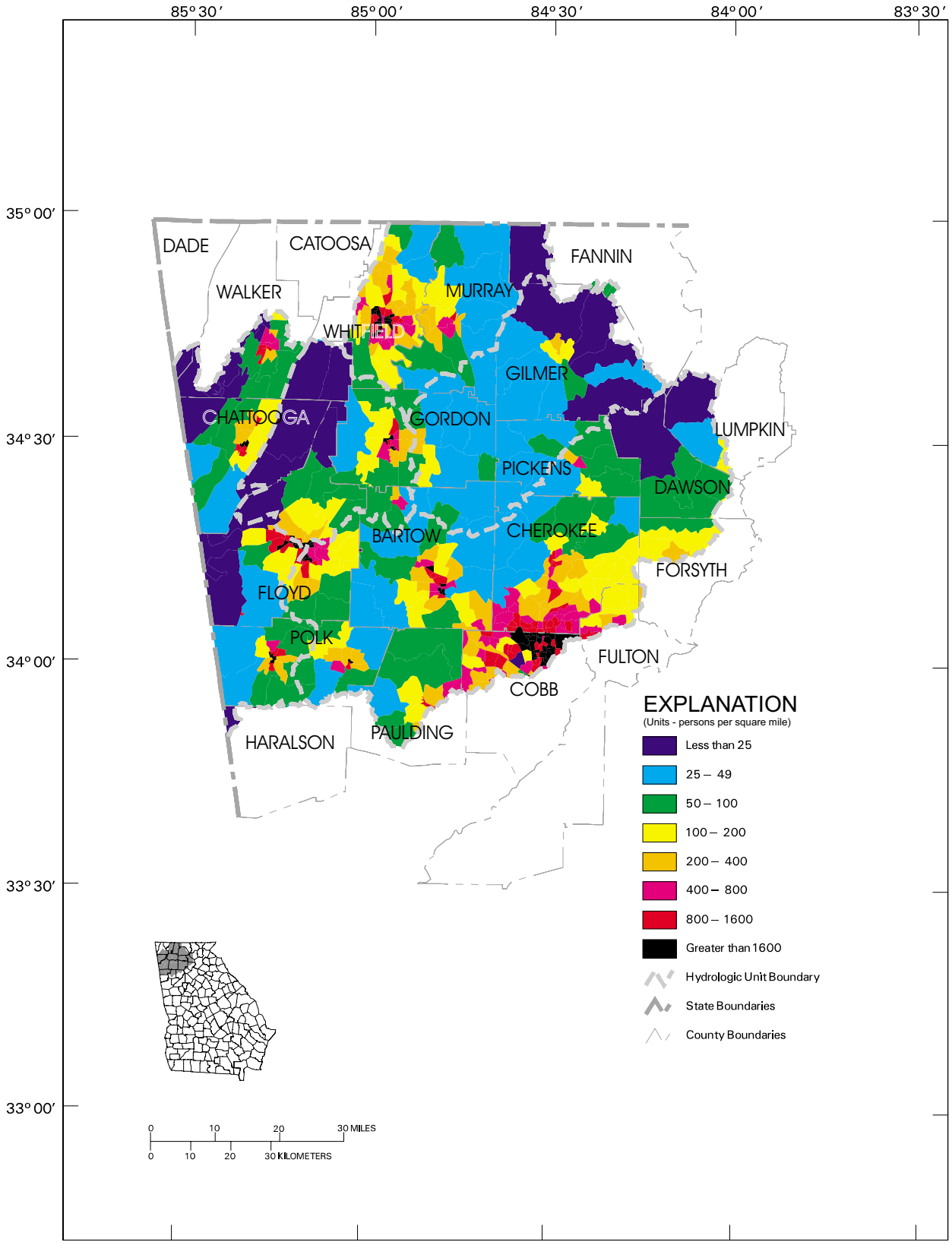


Figure 2-12. Population Density in the Coosa River Basin, 1990

Table 2-4. Population Estimates for the Coosa River Basin by HUC (I990)

HUC	Population	Housing Units
03150101 (Georgia, Tennessee)	104247	41310
03150102 (Georgia)	31542	13996
03150103 (Georgia)	52330	20680
03150104 (Georgia)	344437	132063
03150105 (Georgia, Alabama)	114544	48405
Total	*647100*	*256454*

2.2.3 Land Cover and Use

Land use/land cover classification was determined for the Coosa River basin based on high-altitude aerial photography for 1972-1976 and 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 (Figures 2-13 through 2-17) indicated that 77.5 percent of the basin land areas was forest, 17.4 percent was agriculture, and 2.9 percent was urban land use, with 2.1 percent in other land uses, including less than 0.1 percent wetlands. The large percentage in forest includes the extensive landholdings of the Chattahoochee National Forest within this basin.

The 1988-1990 land cover interpretation showed 76 percent of the basin in forest cover, 0.3 percent in wetlands, 2.9 percent in urban land cover, and 15.4 percent in agriculture (Figures 2-18 through 2-22). Statistics for 15 landcover classes in the Georgia portion of the Coosa basin for the 1988-1990 coverage are presented in Table 2-5 (GA DNR, 1996).

Forestry

Forestry is a major part of the economy within the basin. Markets for forest Figure 2-13 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 of 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.

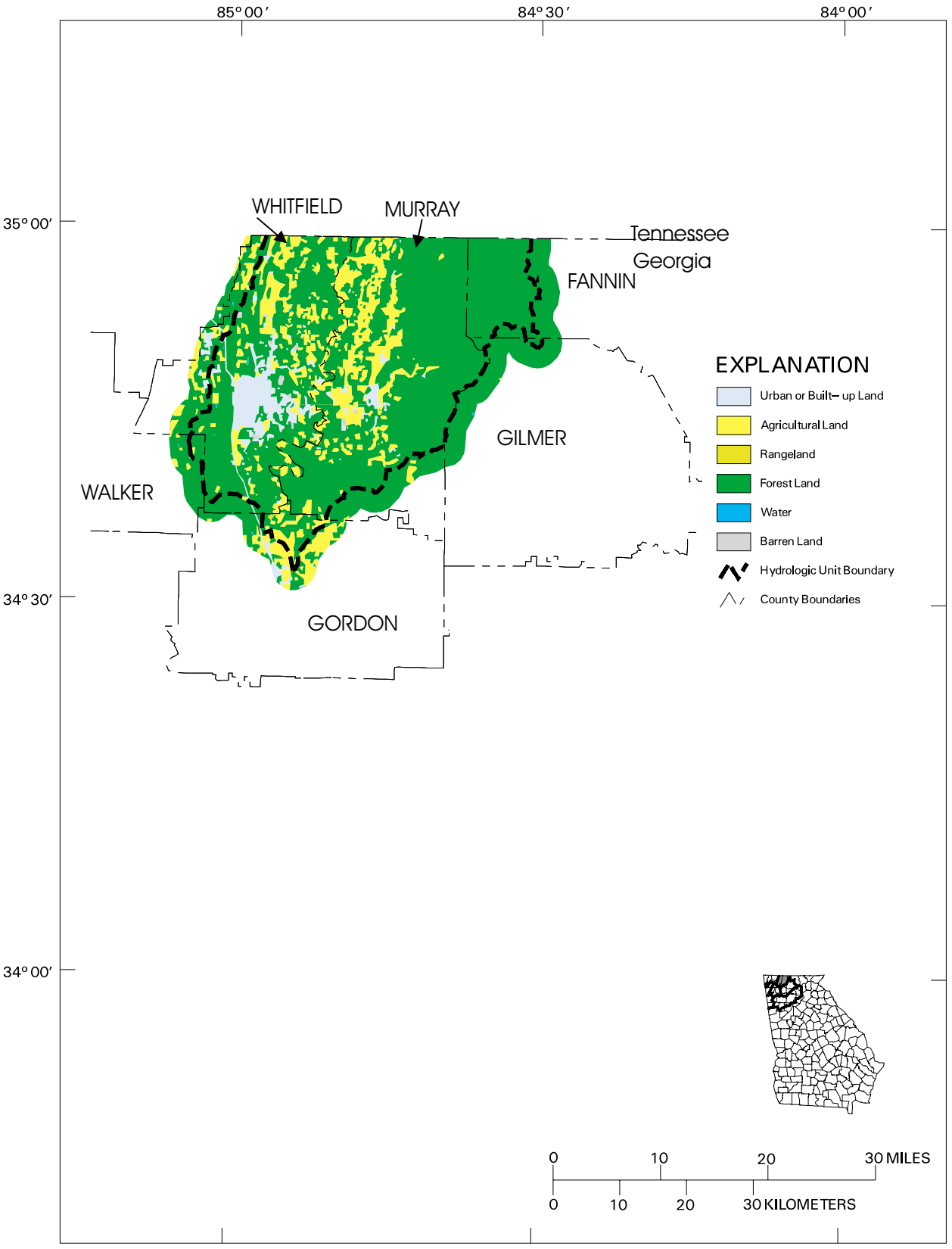


Figure 2-13. Land Use, Coosa River Basin, HUC 03150101, USGS 1972-76 Classification Updated with 1990 Urban Areas

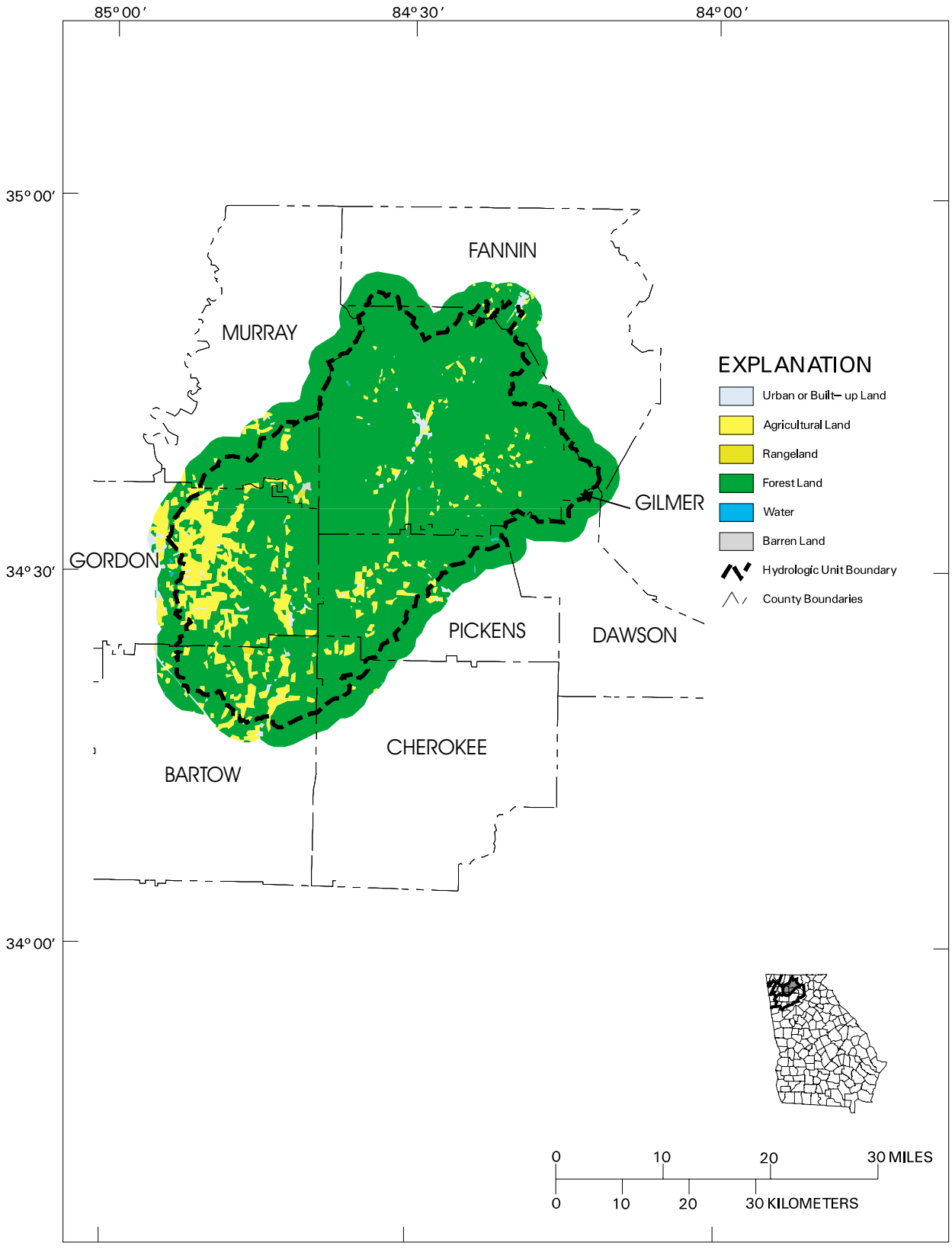


Figure 2-14. Land Use, Coosa River Basin, HUC 03150102, USGS 1972-76 Classification Updated with 1990 Urban Areas

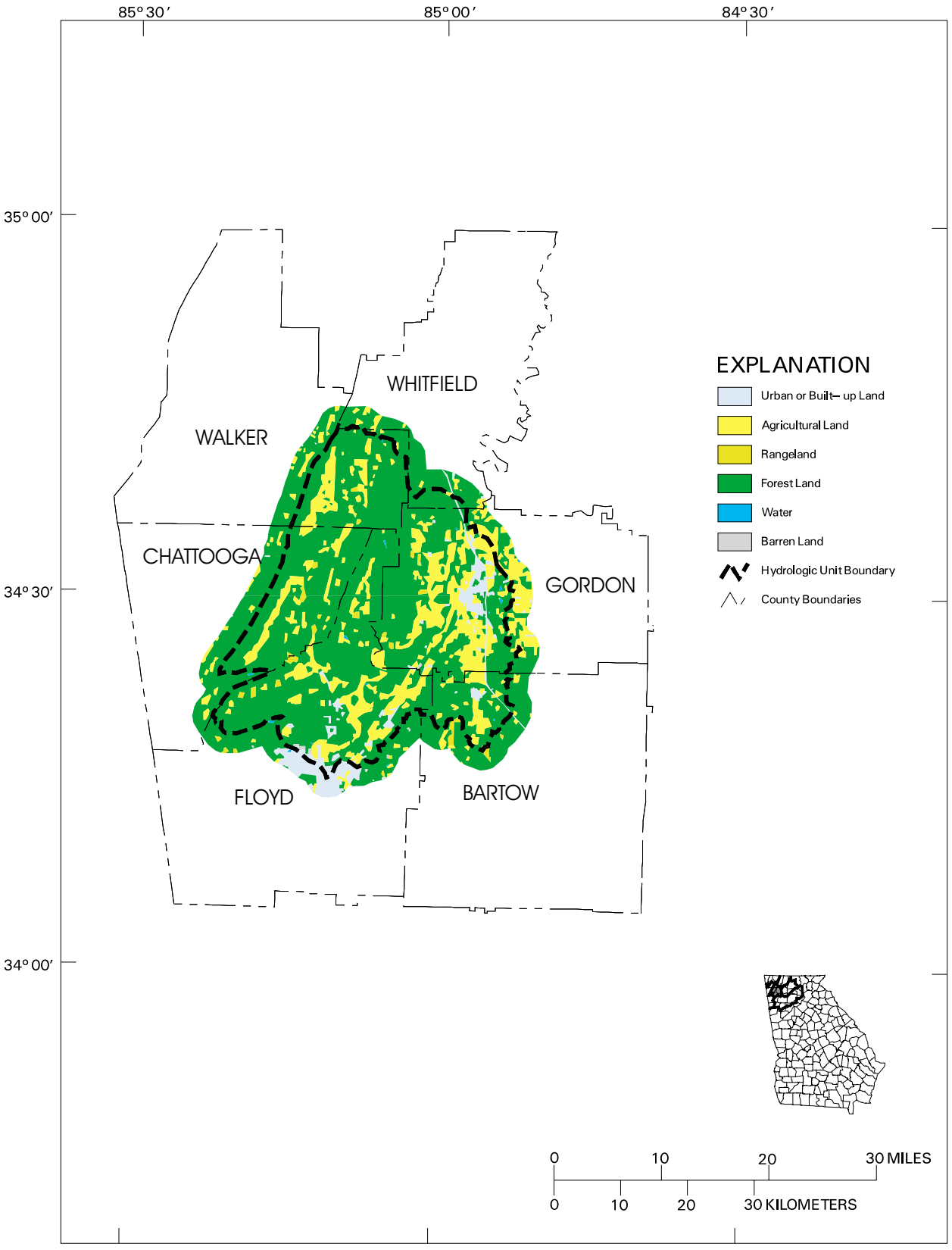


Figure 2-15. Land Use, Coosa River Basin, HUC 03150103, USGS 1972-76 Classification Updated with 1990 Urban Areas

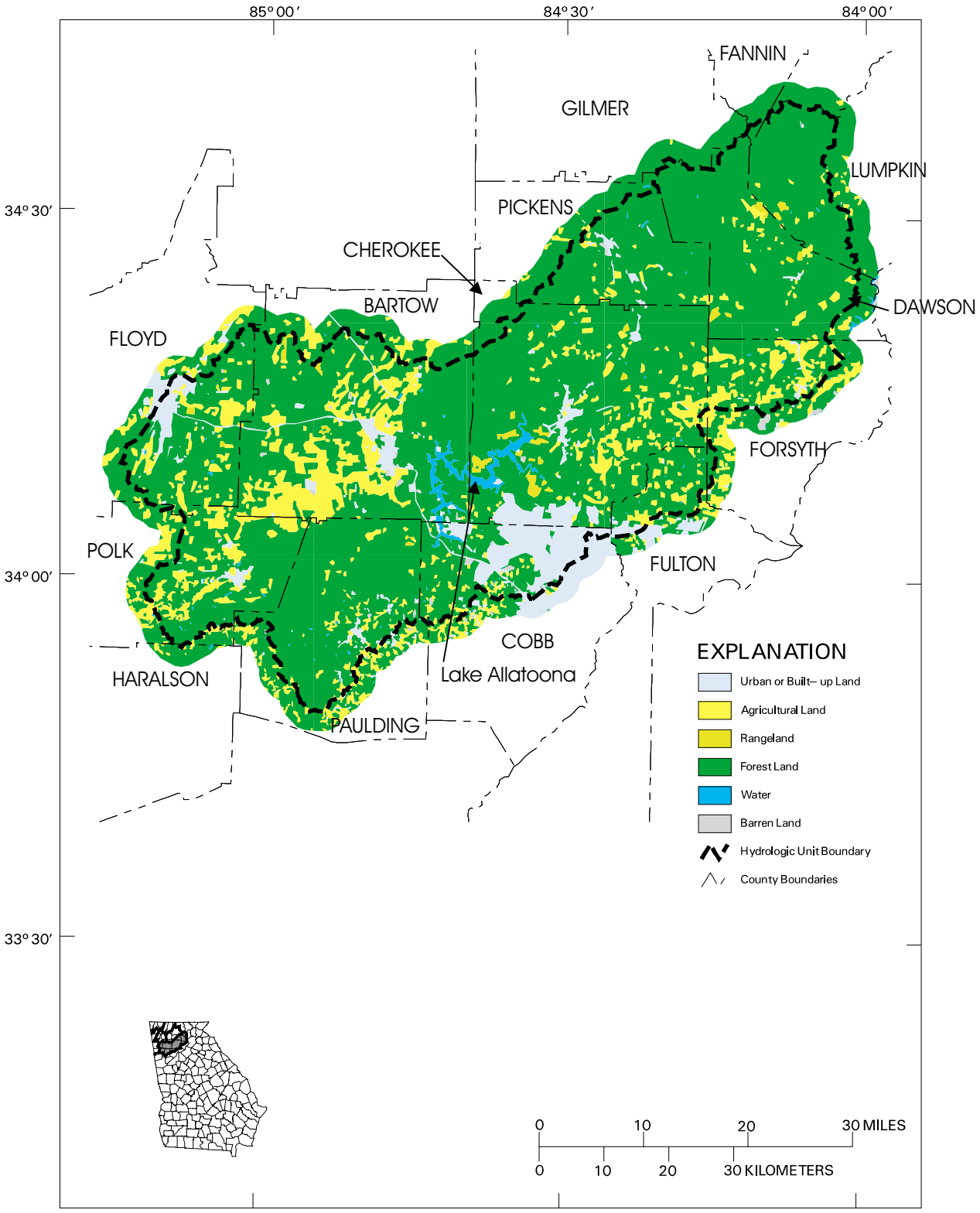


Figure 2-16. Land Use, Coosa River Basin, HUC 03150104, USGS 1972-76 Classification Updated with 1990 Urban Areas

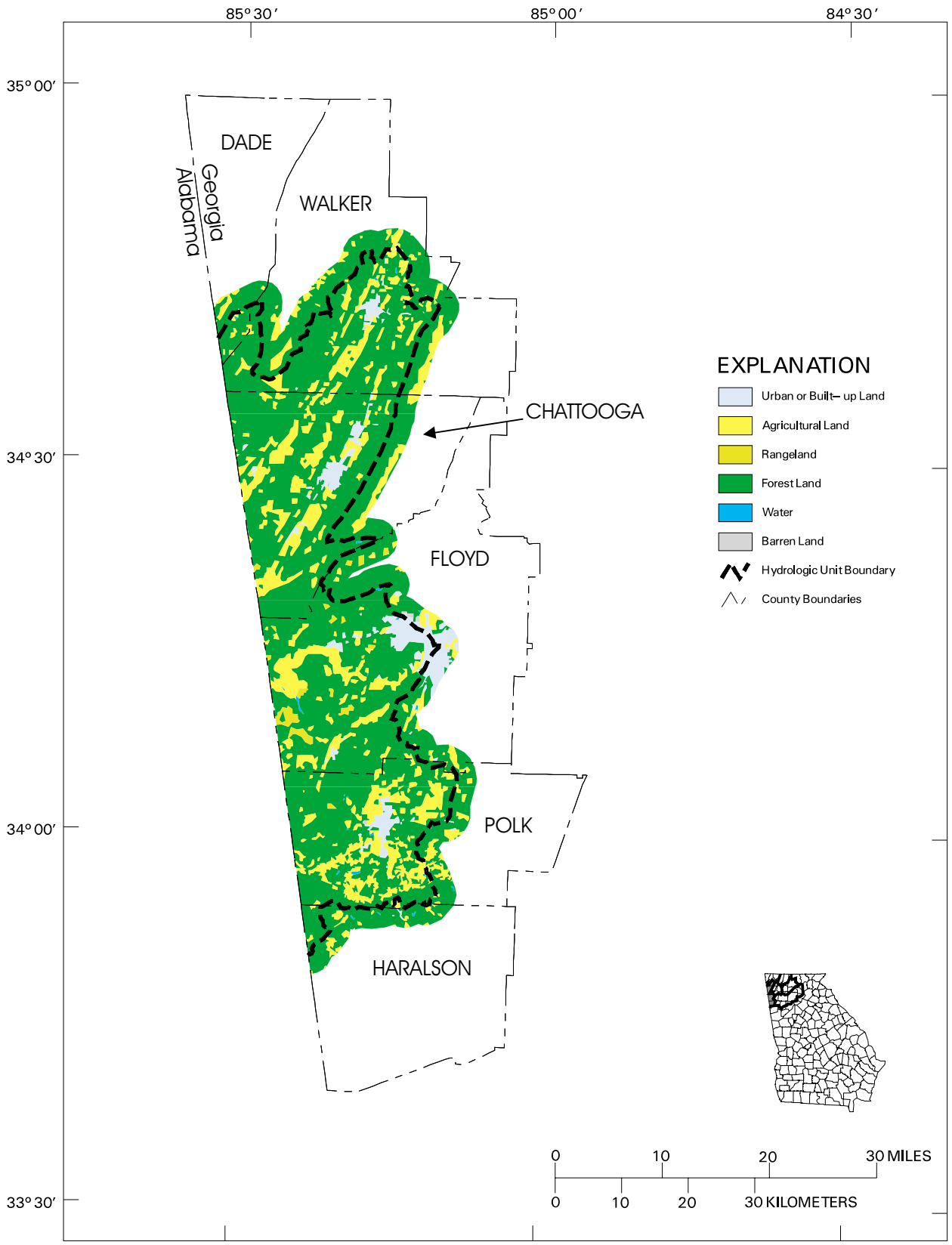


Figure 2-17. Land Use, Coosa River Basin, HUC 03150105, USGS 1972-76 Classification Updated with 1990 Urban Areas

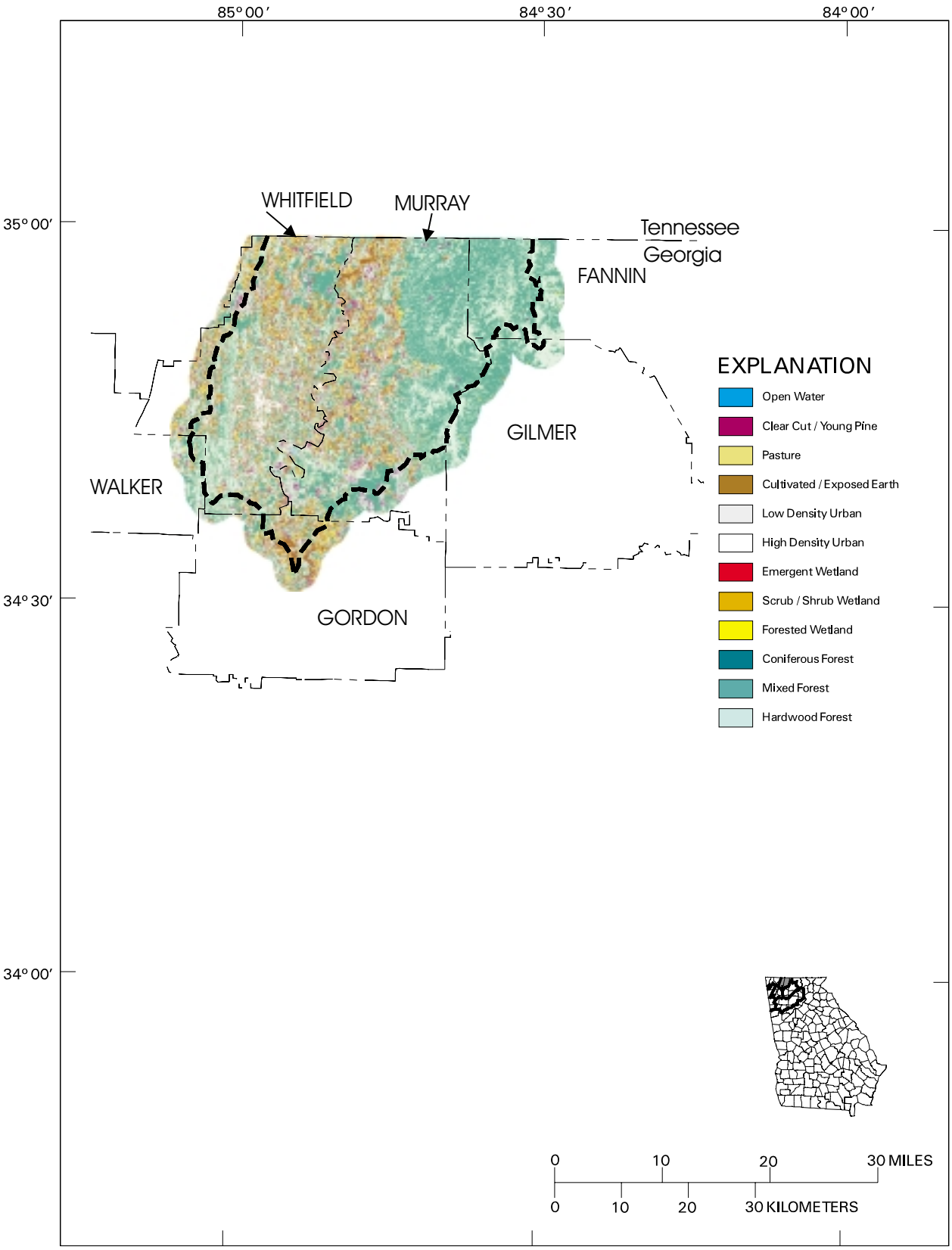


Figure 2-18. Land Cover 1990, Coosa River Basin, HUC 03105010l

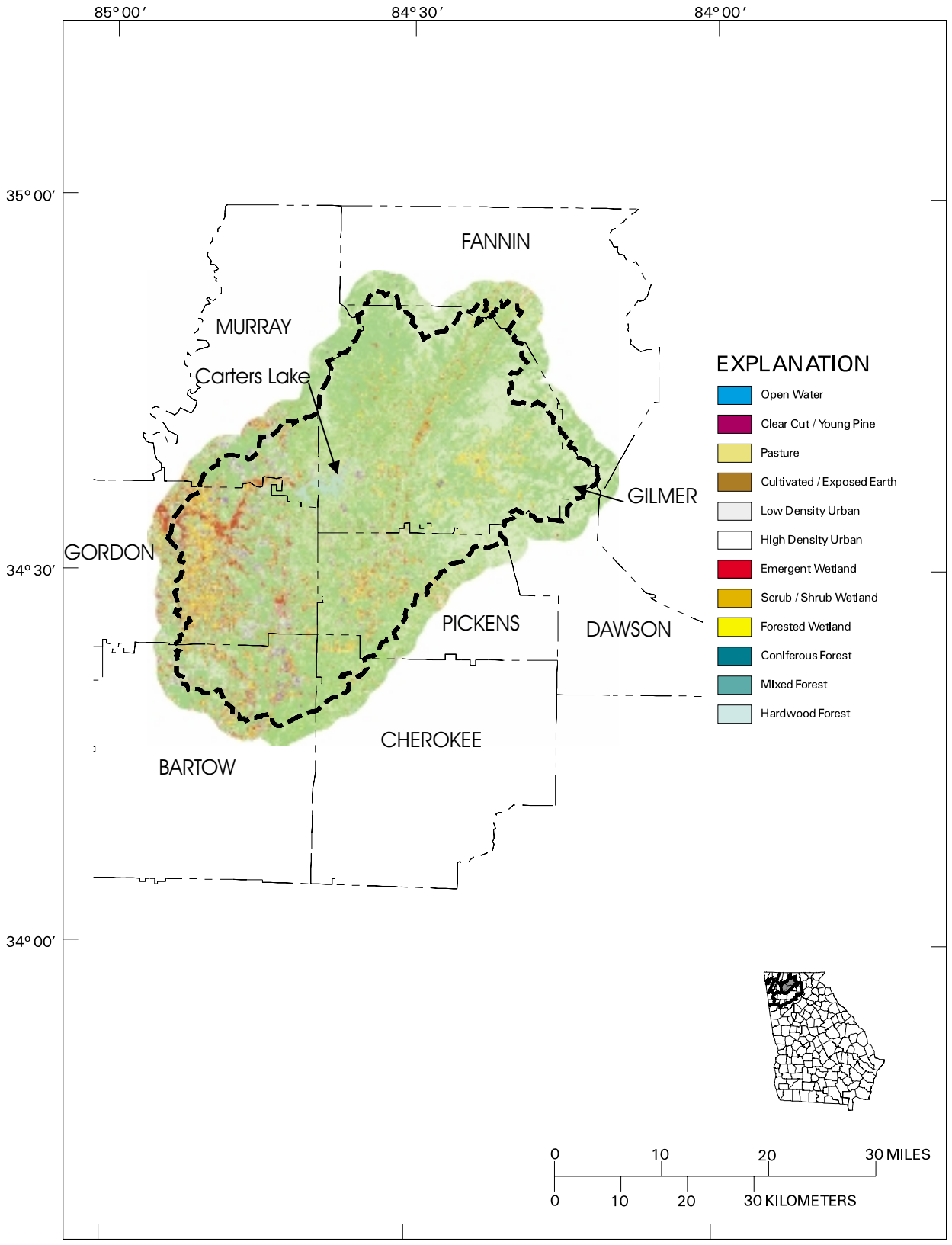


Figure 2-19. Land Cover 1990, Coosa River Basin, HUC 03150102

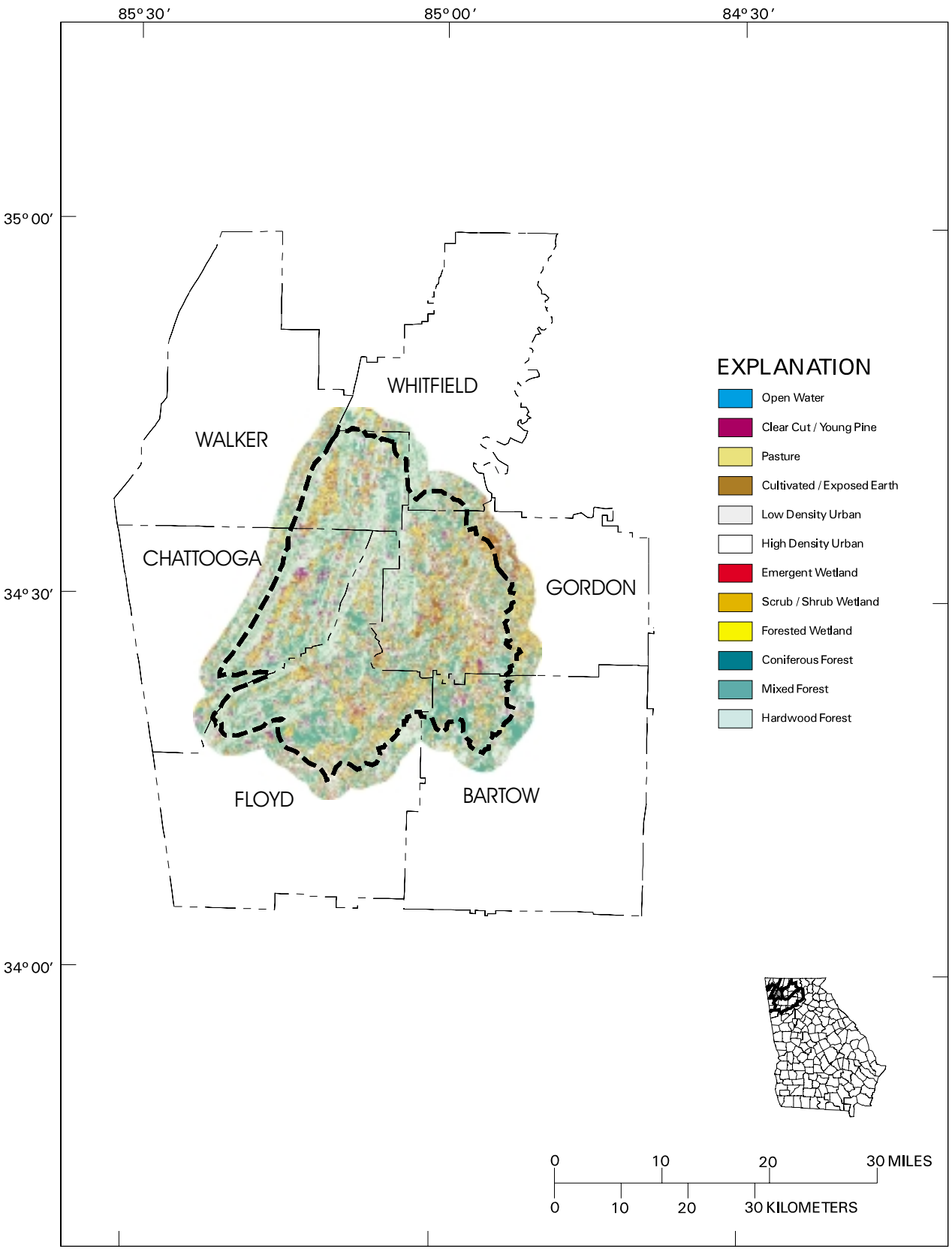


Figure 2-20. Land Cover 1990, Coosa River Basin, HUC 03150103

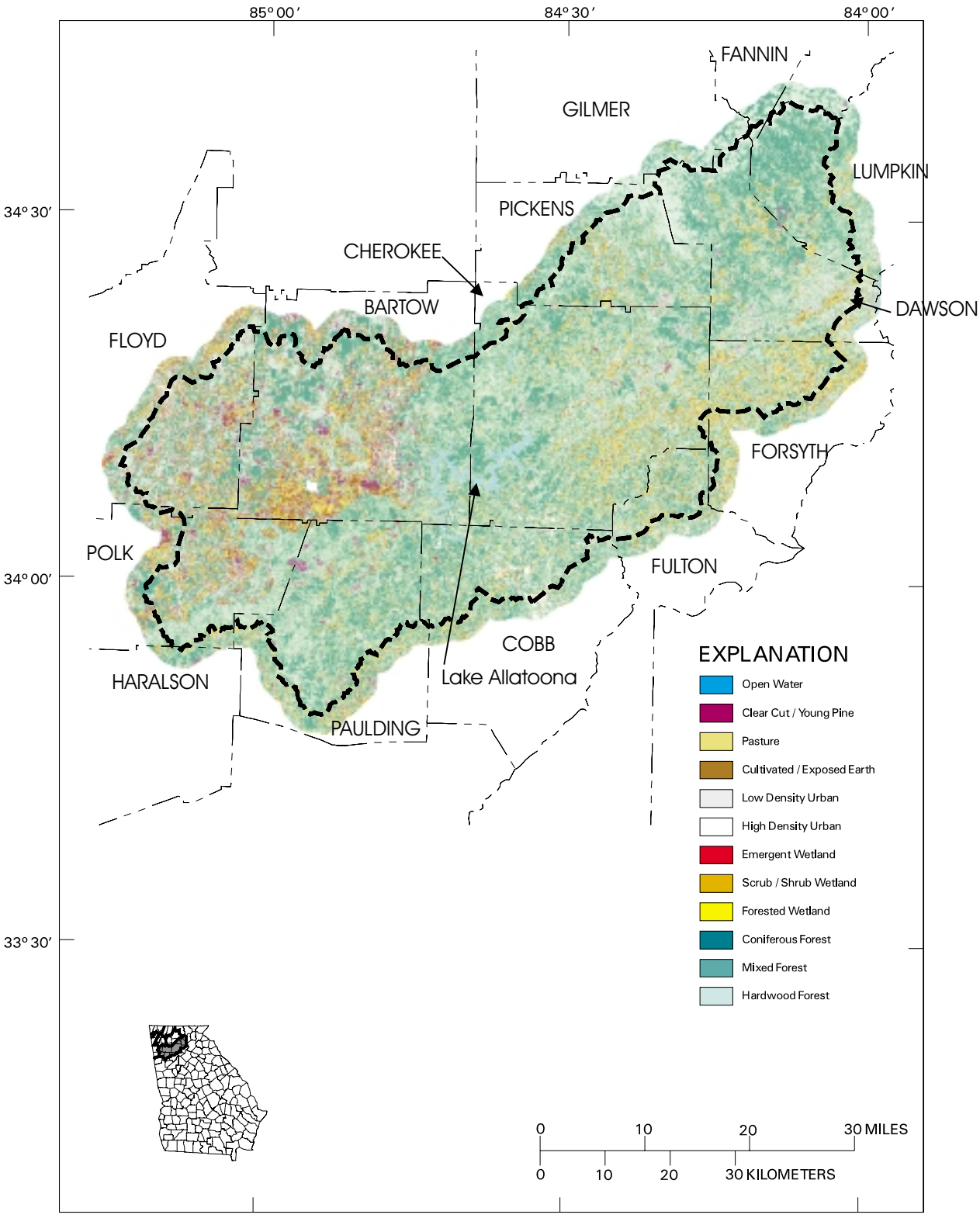


Figure 2-21. Land Cover 1990, Coosa River Basin, HUC 03150104

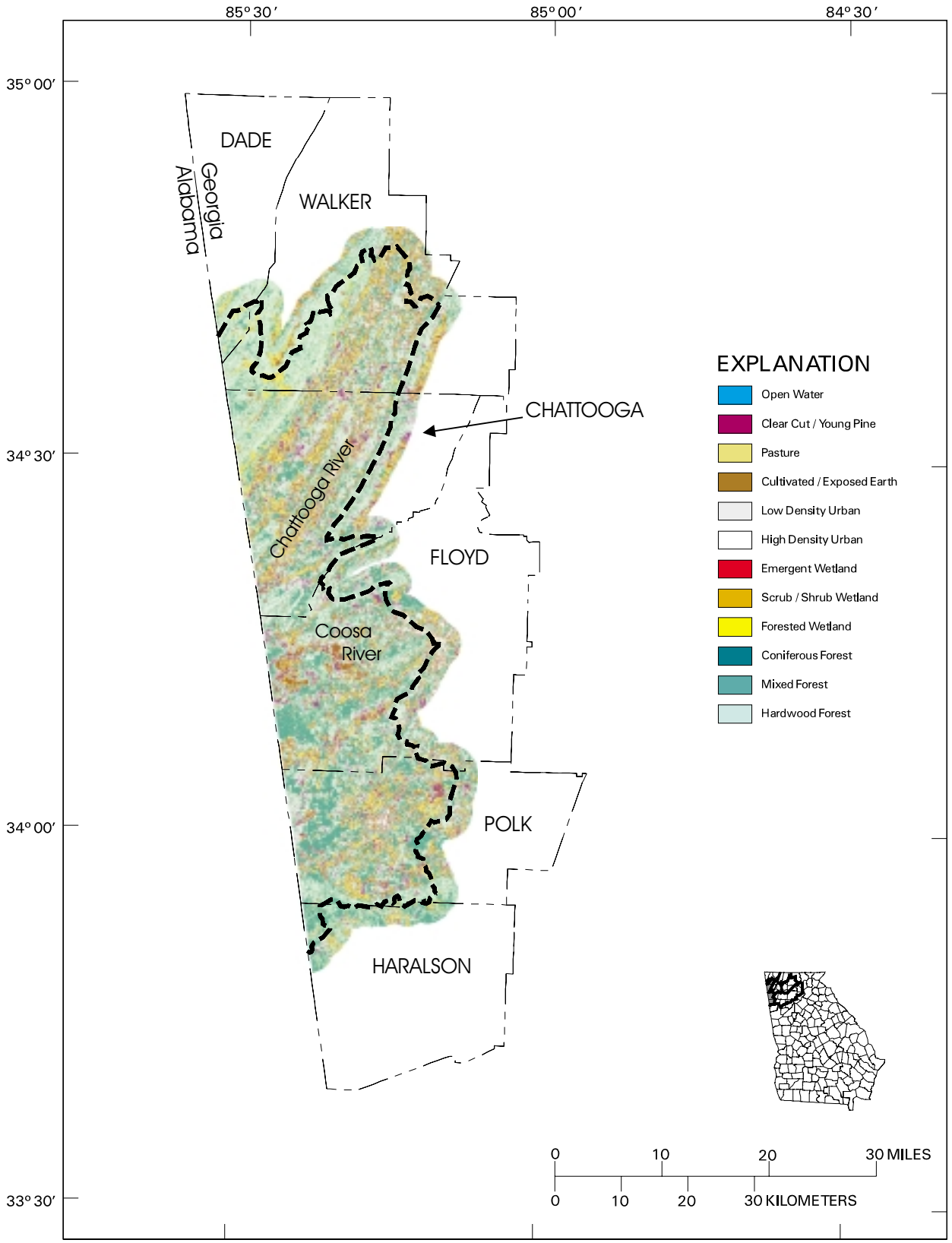


Figure 2-22. Land Cover 1990, Coosa River Basin, HUC 03150105

Table 2-5. Land Cover Statistics for the Coosa Basin, 1988–90

Class Name	%	Acres
Open Water	1.0	31,490.5
Clear Cut/Young Pine	4.6	136,692.0
Pasture	8.8	259,169.1
Cultivated/Exposed Earth	6.6	195,392.9
Low Density Urban	2.1	60,482.3
High Density Urban	0.8	24,881.7
Emergent Wetland	0.0	809.9
Scrub/Shrub Wetland	0.1	1,418.7
Forested Wetland	0.2	6,343.5
Coniferous Forest	22.5	664,882.5
Mixed Forest	23.2	685,230.5
Hardwood Forest	30.1	889,175.4
Salt Marsh	0.0	0.0
Brackish Marsh	0.0	0.0
Tidal Flats/Beaches	0.0	0.0
Total	*100.0*	*2,956,127.0*

According to the 1989 U.S. Forest Service's Forest Statistics for Georgia (Thompson, 1989), there are approximately 2,010,200 acres of commercial forest land in the basin, representing about 69 percent of the total land area. An additional 38,100 acres are classified as forest land but are withdrawn from timber utilization through statute or administrative designation. Private landowners account for 72 percent of the commercial forest ownership, while the forest industry companies account for 16 percent. Governmental entities account for about 12 percent of the forest land. Commercial silvicultural land use is concentrated in the Piedmont and mountains north of Atlanta (Figure 2-23). Forestry acreage in the Coosa River basin is summarized in Table 2-6.

The pine type is composed of 24,700 acres of white pine, 190,100 acres of plantation, and 538,700 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. For the counties entirely within basin, the area classified as commercial forest land decreased 106,986 acres from 2,650,268 acres to 2,543,282 acres. The area classified as pine type (199, 312 acres plantation and 704,569 acres natural) decreased 102,419 acres (10 percent) from 1,006,300 acres to 903,881 acres. The area classified as oak-pine type increased 36,380 acres (8 percent) from 418,116 acres to 454,496 acres. Upland hardwood acreage decreased 33,722 acres (3 percent) from 1,182,849 acres to 1,149,127 acres. Lowland hardwood acres decreased 7,225 acres (17 percent) from 43,003 acres to 35,778 acres.

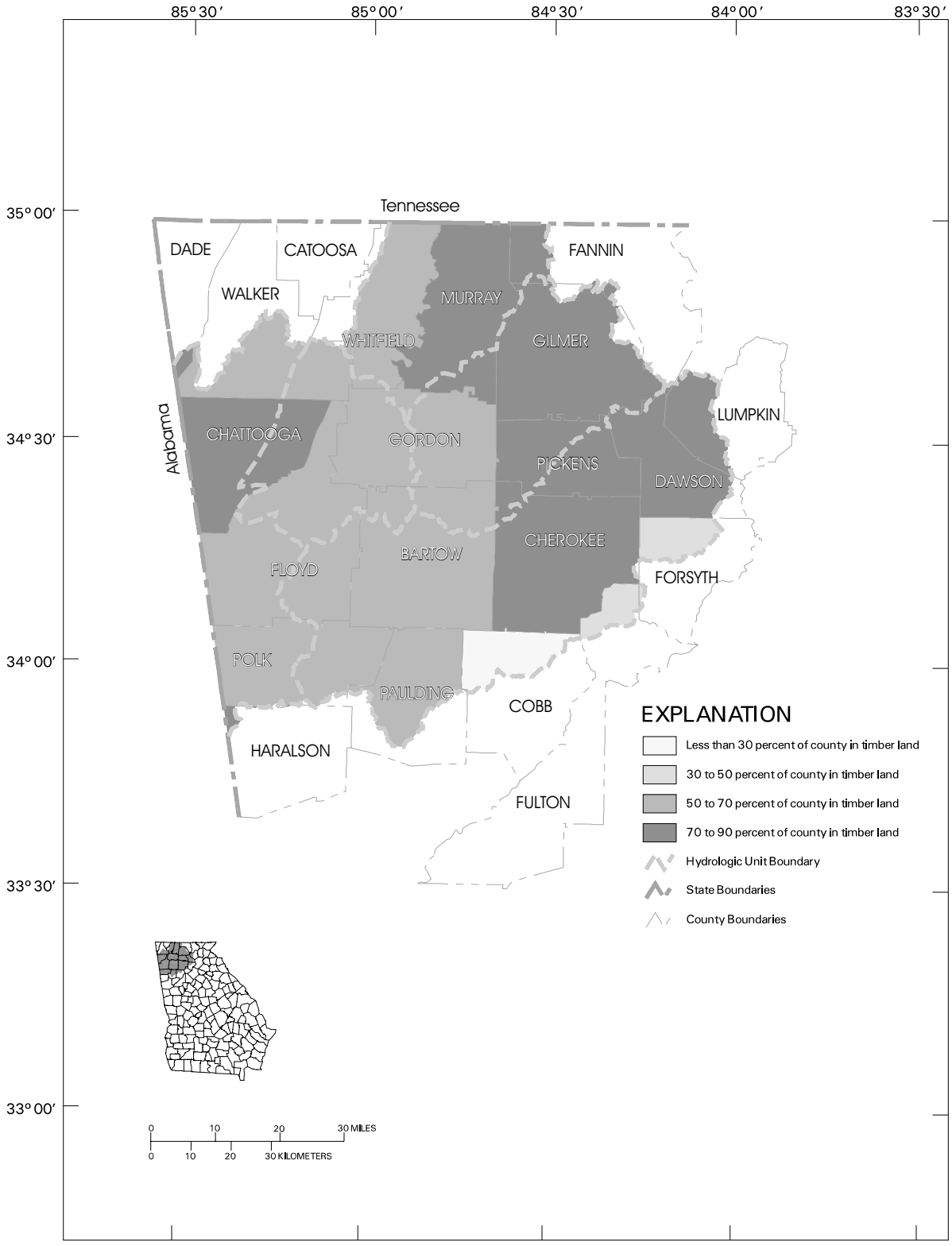


Figure 2-23. Silvicultural Land in the Coosa River Basin

Table 2-6. Forestry Acreage in the Coosa River Basin

County	All Land (acres)	Non-Forest	Commercial Forest	Pine	Oak-pine	Upland Hardwood	Lowland Hardwood
Bartow	291,900	98,600	193,400	86,500	53,900	52,900	0
Chattooga	200,600	56,900	143,700	39,700	25,600	78,400	0
Cherokee	266,700	79,900	186,700	76,700	34,900	70,200	4,700
Cobb	64,800	36,700	28,100	20,800	7,300	0	0
Dade *							
Dawson	116,300	15,400	100,900	21,400	32,300	47,300	0
Fannin	41,400	2,900	9,700	4,900	0	4,900	0
Floyd	331,900	127,600	204,300	85,500	9,400	99,900	9,400
Forsyth	33,700	17,700	16,000	4,000	4,000	8,000	0
Fulton	31,900	9,400	22,500	14,000	2,800	5,600	0
Gilmer	251,700	31,200	217,000	35,000	63,700	113,600	4,700
Gordon	227,200	100,300	126,900	43,800	32,200	40,800	9,900
Haralson	4,900	0	4,900	0	0	0	0
Lumpkin	69,100	4,800	64,300	26,400	10,800	27,000	0
Murray	220,600	57,500	156,900	63,600	21,800	68,100	0
Paulding	123,400	11,700	111,700	55,800	15,200	40,700	0
Pickens	148,600	30,400	118,200	36,100	25,400	56,600	0
Polk	195,600	65,300	130,300	59,800	11,200	59,400	0
Walker	137,900	52,900	85,100	31,200	9,200	44,700	0
Whitfield	158,900	69,300	89,600	43,200	5,900	40,400	0
Total	*2,916,800*	*868,500*	*2,010,200*	*728,700*	*365,600*	*858,600*	*28,800*

** Even though Dade County is within the basin, there were no forest plots located there and as a result no information available.*

Agriculture

Agriculture in the Coosa River basin is a varied mixture of animal operations and commodity production. Total farmland in the basin (Figure 2-24) is on the decline according to the agricultural census (U.S. Bureau of the Census, 1981a,b,c). By 1992, the total amount of land in farms in the basin had fallen to 569,330 acres. Much of the land in farms is pasture; however there are more than 116,000 acres of cropland harvested each year in the Basin. The principle crops include cotton and small grain [wheat, sorghum, soybeans]. Harvested acres among these crops varies from year to year in response to market conditions, government subsidy programs, and weather.

Livestock and poultry production in the Coosa River basin is relatively intense. Approximately 136,000 head of cattle, 70,000 head of swine, and 221,000,000 broilers are currently being raised on farms in the basin (Table 2-7). Gordon County ranks ninth among Georgia counties in cattle production with 24,000 head. Hog production in the basin is led by Bartow County with 21,000 head. Finally, Gordon

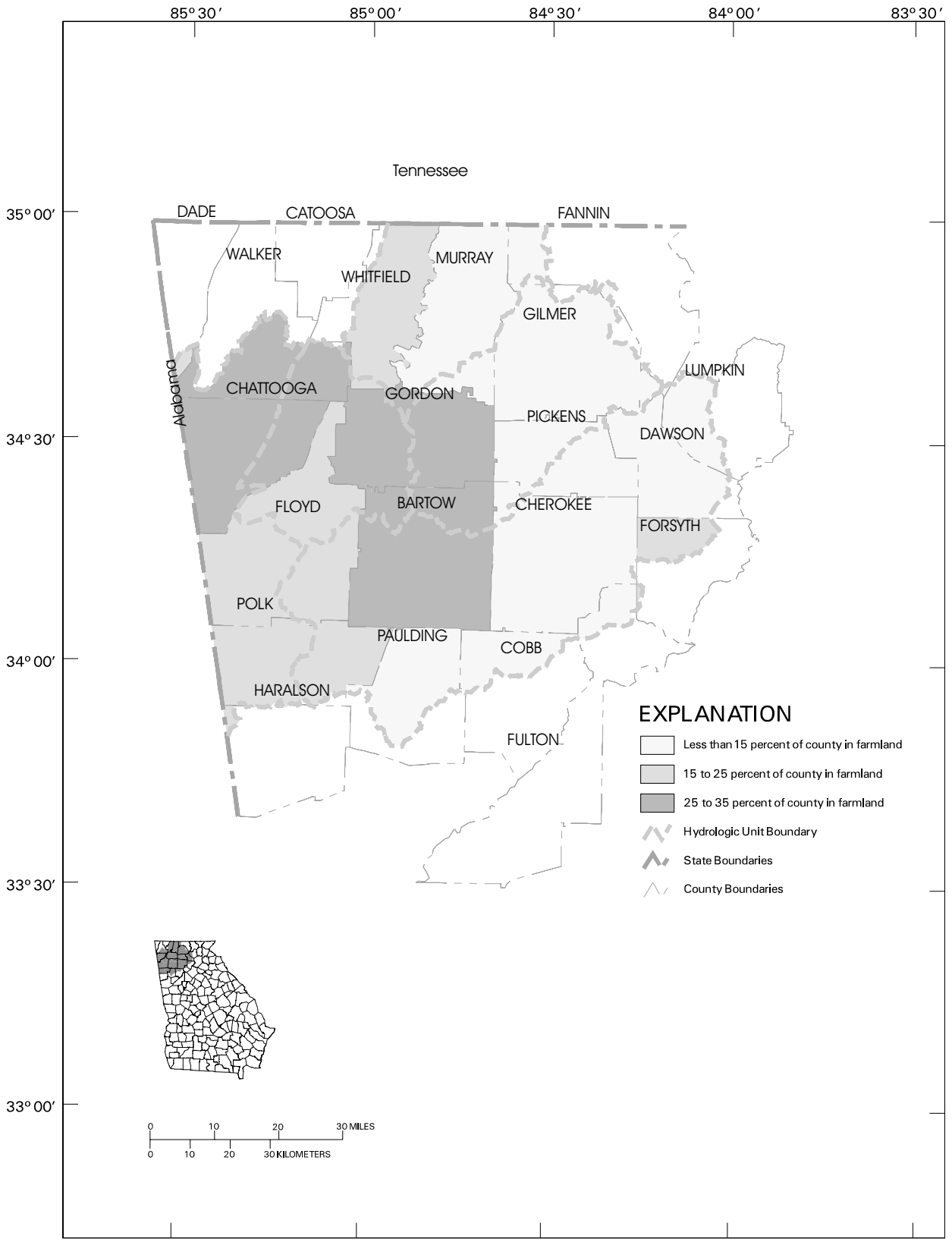


Figure 2-24. Agricultural Land in the Coosa River Basin

Table 2-7. Agricultural Operations in the Coosa River Basin, 1987-1991 (data supplied by NRCS)

Element	Conasausa River Basin HUC 03150101	Coosawattee River Basin HUC 03150102	Oostanaula River Basin HUC 03150103	Etowah River Basin HUC 03150104	Coosa River below Rome and Chattooga River Basin HUC 03150105	Total for Basin
Dairy Cows	800	1,130	470	1,520.00	910	4,830
Beef Cattle	19,380	19,880	16,610	48,670	31,500	136,040
Hogs	5,100	19,000	4,000	35,330	6,480	69,910
Layer Hens (thousands)	60	48	57	342	24	531
Broilers (thousands)	17,254	68,827	28,528	93,285	13,647	221,540
Harvested Cropland (acres)	14,470	14,750	16,820	42,750	27,640	116,430
Total Agriculture (acres)	*64,210*	*69,920*	*61,490*	*228,430*	*145,280*	*569,330*

and Forsyth counties collectively produce over 54,000,000 broilers and layers each year, ranking them among the top 10 counties in Georgia's poultry industry.

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.

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 (RDCs), 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 the operation of water supply and wastewater treatment facilities.

The Coosa basin includes part or all of 20 Georgia counties (Table 2-8 and Figure 2-2); however, only six counties are entirely within the basin. Two counties (Dade and Haralson) have only a tiny amount of area in the basin. Thus, there are a total of 18 counties with significant planning jurisdiction in the basin. Municipalities or cities are communities officially incorporated by the General Assembly. Georgia has more than 530 municipalities. Table 2-9 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 2-10 summarizes the RDCs and the associated counties within the Coosa basin.

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 surface waters 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 the EPD in making water use regulatory decisions.

In 1972 the EPD applied the water use classification system to interstate waters in 1972. Georgia was again one of the first states to receive federal approval of a statewide system of water use classifications and standards. Table 2-11 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 2-8. Georgia Counties in the Coosa River Basin

Counties Entirely Within the Coosa Basin	Counties Partially Within the Coosa Basin	Counties with Insignificant Area Within the Coosa Basin
Bartow, Chattoga, Floyd, Gordon, Murray, Pickens	Cherokee, Cobb, Dawson, Fannin, Forsyth, Fulton, Gilmer, Lumpkin, Paulding, Polk, Walker, Whitfield	Dade, Haralson

Table 2-9. Georgia Municipalities in the Coosa River basin

HUC 03150101				
Beaverdale	Crandall	Nicholsville	Rocky Face	Tilton
Chatsworth	Dayton	Phelps	Spring Place	Waring
Cisco	Eton	Ramhurst	Sumac	Varnell
Cohutta	Mill Creek	Red Clay	Tennga	
HUC 03150102				
Blaine	Ellijay	Funkhouser	Pine Chapel	Rydal
Carters	Fairmount	Hinton	Pine Log	Sonoraville
Cash	Farmville	Ludville	Ranger	Talking Rock
Cherrylog	Folsom	Oakman	Redbud	Whitestone
HUC 03150103				
Adairsville	Damascus	Lillypond	Reeves	Villanow
Armuchee	Echota Village	McDaniels	Resaca	
Calhoun	Everrett Springs	Mt. Berry	Shannon	
Crystal Springs	Floyd City	Oostanaula	Subligna	
Curryville	Hill City	Plainsville	Sugar Valley	
HUC 03150104				
Acworth	Cassville	Keithsburg	Nelson	Six Mile
Aragon	Dallas	Kennesaw	New Hope	Stilesboro
Ball Ground	Dawsonville	Kingston	North Canton	Sutalee
Birmingham	Ducktown	Landrum	Oakland Heights	Tate
Blackwells	Emerson	Lathemtown	Portland	Taylorsville
Braswell	Euharlee	Lebanon	Rockmart	Van Wert
Cagle	Free Home	Lindale	Rome	Victoria
Canton	Halls	Marblehill	Seney	Waleska
Cartersville	Holly Springs	Matt	Silver City	White
Cass	Jasper	Mountain Park	Silver Creek	Woodstock
HUC 03150105				
Berryton	Chattoogaville	Holland	Lyerly	Summerville
Cave Spring	Cloudland	LaFayette	Menlo	Trion
Cedartown	Coosa	Lake	Mount Carmel	
Center Post	Esom Hill	Lavender	Prior	

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

Table 2-I0. Regional Development Centers in the Coosa River Basin

Regional Development Center	Member Counties with Land Area in the Coosa Basin
Coosa Valley RDC	Bartow, Chattooga, Dade, Floyd, Gordon, Haralson, Paulding, Polk, Walker
North Georgia RDC	Fannin, Gilmer, Murray, Pickens, Whitfield
Georgia Mountains RDC	Dawson, Forsyth, Lumpkin
Atlanta Regional Commission	Cherokee, Cobb, Fulton

Table 2-II. 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 were originally 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/l. 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 fishing with the exception of dissolved oxygen which is site specific.*

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 Coosa River Basin

Waters in the Coosa River basin are classified as fishing, recreation, drinking water, or wild and scenic. Most of the waters are classified as fishing. Those waters explicitly classified in Georgia regulations are shown in Table 2-12; all other waters in the basin are classified as fishing. A number of waters in the northern portion of the Coosa River basin are also designated as primary or secondary trout streams, as shown in Table 2-13. Primary trout streams are defined as streams containing naturally-reproducing populations of brook trout, brown trout, and/or rainbow trout, while secondary trout streams contain no naturally-reproducing trout populations but are capable of sustaining stocked trout throughout the year.

Table 2-I2. Coosa River Basin Waters Classified in Georgia Regulations[1]

Water body	Description of Segment	Use Classification
Conasauga River	Georgia Hwy. 2 to Dalton Water Intake	Drinking Water
Ellijay River	Headwaters to Ellijay Water Intake	Drinking Water
Cartecay River	Headwaters to Ellijay Water Intake	Drinking Water
Coosawattee River	Confluence to Mountaintown Creek to Carters Dam	Recreation
Coosawattee River	U.S. Hwy. 411 to confluence of Conasauga River	Drinking Water
Oostanaula River	Confluence to Conasauga and Coosawattee Rivers to Calhoun Water Intake	Drinking Water
Oostanaula River	Confluence with Armuchee Creek to Rome Water Intake	Drinking Water
Oostanaula River	Confluence of Little Dry Creek (below Rome Water Intake) to Coosa River	Fishing
Etowah River	Cherokee County Road 782 to Canton Water Intake	Drinking Water
Etowah River	Georgia Hwy. 20 to Allatoona Dam	Recreation and Drinking Water
Etowah River	Allatoona Dam to Cartersville Water Intake	Drinking Water
Coosa River	Confluence of Etowah and Coosawattee to Mayo's Lock and Dam	Fishing
Coosa River	At the Alabama State Line	Recreation
Mill Creek	Headwaters to Dalton Water Supply	Drinking Water
Conasauga River	Waters Within the Cohutta Wilderness Area	Wild and Scenic
Jacks Creek	Waters Within the Cohutta Wilderness Area	Wild and Scenic

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

Table 2-I3. Coosa River Basin Waters Classified as Trout Streams

County	Classification	Description of Segment
Bartow	Secondary	Boston Creek watershed upstream from Georgia Hwy. 20
	Secondary	Connesena Creek watershed
	Secondary	Dykes Creek watershed
	Secondary	Pine Log Creek watershed
	Secondary	Pyle Creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Spring Creek watershed
	Secondary	Stamp Creek watershed upstream from Bartow County Road 269
	Secondary	Toms Creek watershed upstream from Bartow County Road 82
	Secondary	Two Run Creek watershed
	Secondary	Ward Creek watershed
Chattooga	Secondary	Allgood Branch watershed upstream from Southern Railroad
	Secondary	Chappel Creek watershed
	Secondary	Chelsea Creek watershed
	Secondary	East Fork Little River watershed

County	Classification	Description of Segment
	Secondary	Hinton Creek watershed
	Secondary	Kings Creek watershed
	Secondary	Little Armuchee Creek watershed upstream from Chattooga County Road 326
	Secondary	Middle Fork Little River watershed
	Secondary	Mt. Hope Creek watershed
	Secondary	Perennial Spring watershed
	Secondary	Racoon Creek watershed upstream from Georgia Hwy. 48
	Secondary	Ruff Creek watershed
	Secondary	Storey Mill Creek watershed
	Secondary	Taliaferro Creek watershed
Cherokee	Secondary	Boston Creek watershed
	Secondary	Pine Log creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Stamp Creek watershed
	Secondary	Bluff Creek watershed upstream from Cherokee County Road 114
	Secondary	Murphy Creek watershed
	Secondary	Soap Creek watershed upstream from Cherokee County Road 116
	Secondary	Wiley Creek watershed
Dawson	Primary	Amicalola Creek watershed upstream from Dawson County Road 192 (Devil's Elbow Road)
	Primary	Sweetwater Creek watershed
	Primary	Anderson Creek watershed
	Primary	Long Swamp Creek watershed
	Primary	Nimblewill Creek watershed
	Secondary	Amicalola Creek watershed form Georgia Hwy. 53 upstream to Dawson County Road 192 (Devil's Elbow Road)
	Secondary	Shoal Creek watershed upstream from the mouth of Burt Creek
Fannin	Primary	Conasauga River - Jacks River watershed
	Primary	Ellijay River watershed
	Primary	Etowah River watershed
	Secondary	All streams or sections of stream in county not Primary
Floyd	Secondary	Dykes Creek watershed
	Secondary	Johns Creek watershed upstream from Floyd County Road 212
	Secondary	Kings Creek watershed
	Secondary	Lavender Creek watershed upstream from Floyd County Road 234
	Secondary	Little Cedar Creek watershed
	Secondary	Mt. Hope Creek watershed
	Secondary	Spring Creek watershed (flows into Etowah River)
	Secondary	Spring Creek watershed (flows into State of Alabama)
	Secondary	Toms Creek watershed

County	Classification	Description of Segment
	Secondary	Silver Creek watershed upstream from Georgia Highway 1E
Gilmer	Primary	Cartecay River watershed upstream from the mouth of Clear Creek
	Primary	Clear Creek watershed upstream from Gilmer County Road 92
	Primary	Conasauga River - Jacks River watershed
	Primary	Ellijay River watershed upstream from the mouth of Kells Creek
	Primary	Harris Creek watershed
	Primary	Johnson Creek watershed
	Primary	Mountaintown Creek watershed upstream from U.S. Highway 76
	Primary	Tails Creek watershed upstream from Georgia Hwy. 282
	Secondary	All other streams not classified as primary (except Talking Rock Creek & Coosawatee below Highway 5)
	Secondary	Ball Creek watershed
	Secondary	Sevenmile Creek watershed
	Secondary	Town Creek watershed
	Secondary	Wildcat Creek watershed
Gordon	Secondary	Johns Creek watershed
	Secondary	Long Branch watershed
	Secondary	Pine Log Creek watershed upstream from Georgia Hwy. 53
	Secondary	Pin Hook Creek watershed upstream from Ryo Road
	Secondary	Rocky Creek watershed upstream from West Union Road
	Secondary	Salacoa Creek watershed upstream from U.S. Hwy. 411
	Secondary	Snake Creek watershed
	Primary	Etowah River watershed upstream from the Ga Highway 52 Bridge
	Secondary	Etowah River watershed upstream from Castleberry Bridge to Hwy 52 except those Primary above
Murray	Primary	Conasauga - Jacks River watershed upstream from Georgia - Tennessee state line
	Primary	Holly Creek watershed upstream from Murray County Rd. SR826 (U.S. Forest Service line)
	Primary	Rock Creek watershed upstream from Murray County Rd. 4 (Dennis)
	Secondary	All tributaries to Carters Reservior
	Secondary	Holly Creek watershed (including Emory Creek watershed) upstream from Emory Creek to Murray County Road SR826 (U.S. Forest Service line)
	Secondary	Mill Creek watershed upstream from Murray County Road 27
	Secondary	North Prong Sumac Creek watershed
	Secondary	Sugar Creek watershed upstream from Murray County Road 4
	Secondary	Sumac Creek watershed upstream from Coffey Lake
	Secondary	Mill Creek watershed
	Secondary	Rock Creek watershed upstream of Murray County Road 301
Paulding	Secondary	Possum Creek watershed upstream from Paulding County Road 64
	Secondary	Powder Creek watershed

County	Classification	Description of Segment
	Secondary	Pumpkinvine Creek watershed upstream from Paulding County Road 231
	Secondary	Pyl Creek watershed
	Secondary	Racoon Creek watershed
	Secondary	Ward Creek watershed
	Secondary	Simpson Creek watershed
	Secondary	Thompson Creek watershed
Pickens	Primary	Cartecay River watershed
	Primary	Talking Rock Creek watershed upstream from Route S1011
	Secondary	Amicalola Creek watershed
	Secondary	East Branch watershed (including Damell Creek watershed)
	Secondary	Fisher Creek watershed (upstream from the confluence of Talona Creek and Fisher Creek)
	Secondary	Fourmile Creek watershed
	Secondary	Hobson Creek watershed
	Secondary	Little Scarecorn Creek watershed
	Secondary	Long Branch watershed
	Secondary	Long Swamp Creek watershed upstream from Pickens County Road 294
	Secondary	Mud Creek watershed
	Secondary	Pin Hook Creek watershed
	Secondary	Polecat Creek watershed
	Secondary	Rock Creek watershed
	Secondary	Salacoa Creek watershed
	Secondary	Scarecorn Creek watershed upstream from Georgia Hwy. 53
	Secondary	Ball Creek watershed
	Secondary	Bluff Creek watershed
	Secondary	Sevenmile Creek watershed
	Secondary	Soap Creek watershed
	Secondary	Town Creek watershed
	Secondary	Wildcat Creek watershed
Polk	Secondary	Cedar Creek watershed upstream from Polk County Road 121
	Secondary	Lassetter Creek watershed
	Secondary	Little Cedar Creek watershed
	Secondary	Pumpkinpile Creek watershed upstream from Road SR1032
	Secondary	Spring Creek watershed
	Secondary	Swinney Branch watershed
	Secondary	Thomasson Creek watershed
	Secondary	Fish Creek watershed upstream of Plantation Pipeline
	Secondary	Silver Creek watershed
	Secondary	Simpson Creek watershed upstream of Lake Dorene
	Secondary	Thompson Creek watershed upstream of Polk County Road 441
Walker	Primary	Furnace Creek watershed

County	Classification	Description of Segment
	Primary	Harrisburg Creek watershed
	Secondary	Chappel Creek watershed
	Secondary	Concord Creek watershed
	Secondary	Dry Creek watershed (trib to E.Armuchee Cr)
	Secondary	Duck Creek watershed
	Secondary	E.Armuchee Cr watershed upstream Ga Hwy 136
	Secondary	Johns Creek watershed
	Secondary	Middle Fork Little R. watershed
	Secondary	Ruff Creek watershed
	Secondary	Snake Creek watershed
	Secondary	West Armuchee Creek watershed
	Secondary	West Fork Little River watershed
Whitfield	Secondary	Coahulla Creek watershed upstream Whitfield Co Rd 183
	Secondary	East Armuchee Creek watershed
	Secondary	Snake Creek watershed
	Secondary	Swamp Creek watershed upstream Whitfield Co Rd 9

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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 Coosa basin, whereas water quality is discussed in Section 4. Water use in the Coosa River 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). About 55 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 Coosa River basin because surface water supplies are plentiful and ground water yields from crystalline rock aquifers tend to be low. Ground water supplies are important in some areas underlain by carbonate and fractured sandstone aquifers. Water use in the Coosa basin is expected to remain relatively stable in the near future, due to slow projected rates of population growth and a generally unfavorable employment outlook. The total water demand is projected to remain around 205 MGD from 1995 through 2010.

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 Coosa River Basin

The headwaters area of the Coosa River basin provides the second most used raw water source for drinking water in the state of Georgia. The major tributaries of the Coosa River—the Ellijay, Coosawattee, Oostanaula, Conasauga, and Etowah Rivers—serve a significant portion of the population of the north Georgia area including much of north Atlanta metro population in Cobb, Cherokee, and Bartow counties, as well

as the cities of Dalton and Rome. Often larger public water systems that treat surface water sell water to neighboring cities and counties. Many rural cities use ground water pumped from wells or springs as a source of drinking water. Many smaller subdivisions in the north Atlanta and north Georgia mountain areas also use ground water since they are located too far away from a public water system that sells surface water.

The Coosa River basin provides drinking water for about 725,500 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 regularly serves at least 25 persons at least 60 days a year. Examples of a non-community transient systems are highway rest stops, restaurants, motels, and golf courses.

Private domestic wells serving individual houses are not covered by the state's 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 Coosa River basin there are 34 community public water systems using surface water and serving 644,914 people and 14 community public water systems using ground water and serving 67,986 people (Table 3-1). The locations of surface water intakes within each of the Hydrologic Units of the Coosa River basin are shown in Figures 3-1 through 3-5.

3.I.2 Drinking Water Demands

Drinking water demands are expected to increase due to the explosive growth in the North Atlanta Metro area, especially the subdivision communities in Cobb, Cherokee, Bartow, and Paulding. The North Georgia mountain area is also expected to have increased drinking water demands due to the construction of many retirement and secondary homes. Based on current and forecasted growth, many of the Atlanta Metro counties have adopted water conservation techniques, including ordinances for low flow

Table 3-I. Community Public Water Systems in the Coosa River Basin

Public Water System Name	Water System ID	County	Source
Systems Directly Supplied by Surface Water (arranged by HUC)			
Conasauga River Basin HUC 03150101			
Dalton Utilities	3130000	Whitfield	1. Conasauga River (at plant) 2. Mill Creek 3. Conasauga River 4. Coahulla Creek
City of Chatsworth	2130000	Murray	Holly Creek
Coosawattee River Basin HUC 03150102			
City of Chatsworth	2130000	Murray	Carter's Lake
City of Calhoun	1290000	Gordon	Coosawattee River
City of Ellijay	1230000	Gilmer	1. Ellijay River 2. Cartacay River
Walnut Mtn. Subdivision	2270004	Gilmer	Lake Dawka
Oostanaula River Basin HUC 03150103			
City of Calhoun	1290000	Gordon	Oostanaula River
Berry College	1150003	Floyd	Possum Trot Lake
City of Rome, Water Department	1150002	Floyd	1. Etowah River 2. Oostanaula River
Etowah River Basin HUC 03150104			
Bent Tree Community	2270003	Pickens	1. Lake Tamarack 2. Chestnut Grove Creek
City of Etowah	0850000	Dawson	Etowah River
City of Jasper	2270000	Pickens	Long Swamp Creek
Cherokee County Water and Sewer Authority	0570002	Cherokee	Etowah River
City of Canton	0570001	Cherokee	Etowah River
City of Cartersville	0150002	Cherokee	Lake Allatoona
Cobb Co./Marietta Water Authority	0670002	Cobb	Lake Allatoona
City of Rockmart Water Authority	2330002	Polk	Euharlee Creek
Coosa River below Rome and Chattooga River Basin HUC 03150105			
City of Summerville	0550003	Chattooga	Raccoon Creek
City of Lafayette	2950002	Walker	Duck (Dry) Creek
Systems Supplied by Other Sources (arranged by county)			
Lake Arrowhead Subdivision	0570006	Cherokee	Groundwater
Little River Mobile Home Park	0570007	Cherokee	Groundwater
Oakland Trailer Park	0570015	Cherokee	Groundwater
Page's Mobile Home Park	0570057	Cherokee	Groundwater
Red Barn Mobile Home Park	0570025	Cherokee	Purchased Surface Water
Rock Creek Estates	0570023	Cherokee	Purchased Surface Water
Sunset Estates	0570073	Cherokee	Groundwater
Waleska	0570024	Cherokee	Purchased Surface Water

Public Water System Name	Water System ID	County	Source
Woodstock	0570003	Cherokee	Purchased Surface Water
Austell	0670001	Cobb	Purchased Surface Water
Cobb County	0670003	Cobb	Purchased Surface Water
Fairway Villas	0670009	Cobb	Groundwater
Kennesaw	0670004	Cobb	Purchased Surface Water
Marietta	0670005	Cobb	Purchased Surface Water
Powder Springs	0670006	Cobb	Groundwater
Smyrna	0670007	Cobb	Purchased Surface Water
Athens Boat Club	0850012	Dawson	Groundwater
Dawsonville	0850000	Dawson	Purchased Surface Water
Cave Spring	1150000	Floyd	Groundwater
Floyd County	1150001	Floyd	Purchased Surface Water
Eagle Mountain Resort	1230045	Gilmer	Purchased Surface Water
Lakeside Mobile Home Park	1230051	Gilmer	Groundwater
Talking Rock Creek Properties	1290021	Gordon	Purchased Surface Water
Etowah Ridge Duplexes	1870056	Lumpkin	Groundwater
Hidden Lake Academy	1870054	Lumpkin	Groundwater
Fort Mountain Estates	2130010	Murray	Groundwater
Dallas	2230000	Paulding	Purchased Surface Water
Paulding County Water Auth.	2230002	Paulding	Purchased Surface Water
Polk County Water Authority	2330001	Polk	Groundwater Under the Influence of Surface Water

household plumbing in new construction, limits on outside watering during the summer months, increased water rates to curb excess use, and public education. In 1990, Georgia became one of the first states to adopt ultra-low flow standards for plumbing fixtures. Under this law, local governments were required to adopt ultra-low flow standards (1.6 gpf toilets, 2.5 gpm showerheads, 1.0 gpf urinals, etc.) in order to remain eligible to receive any state water or wastewater grant or loan. These requirements were implemented in 1991 and 1992 and apply to new residential and commercial construction and renovations that include replacement of plumbing fixtures. 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 the construction integrity of wells, treatment, and distribution systems; conduct preliminary water sample testing; and submit legal documentation including an

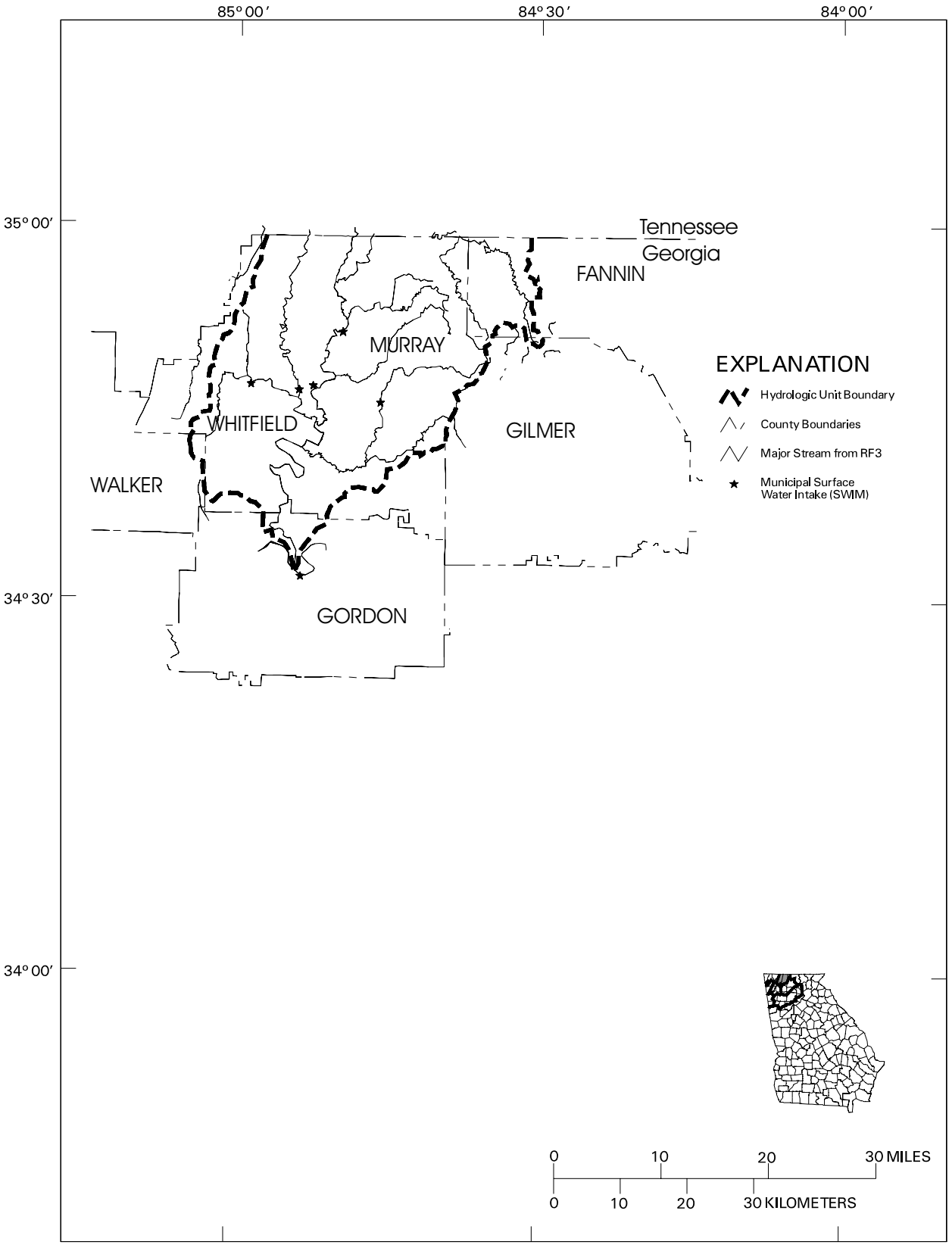

Figure 3-I. Surface Water Intakes, Coosa River Basin, HUC 03150101

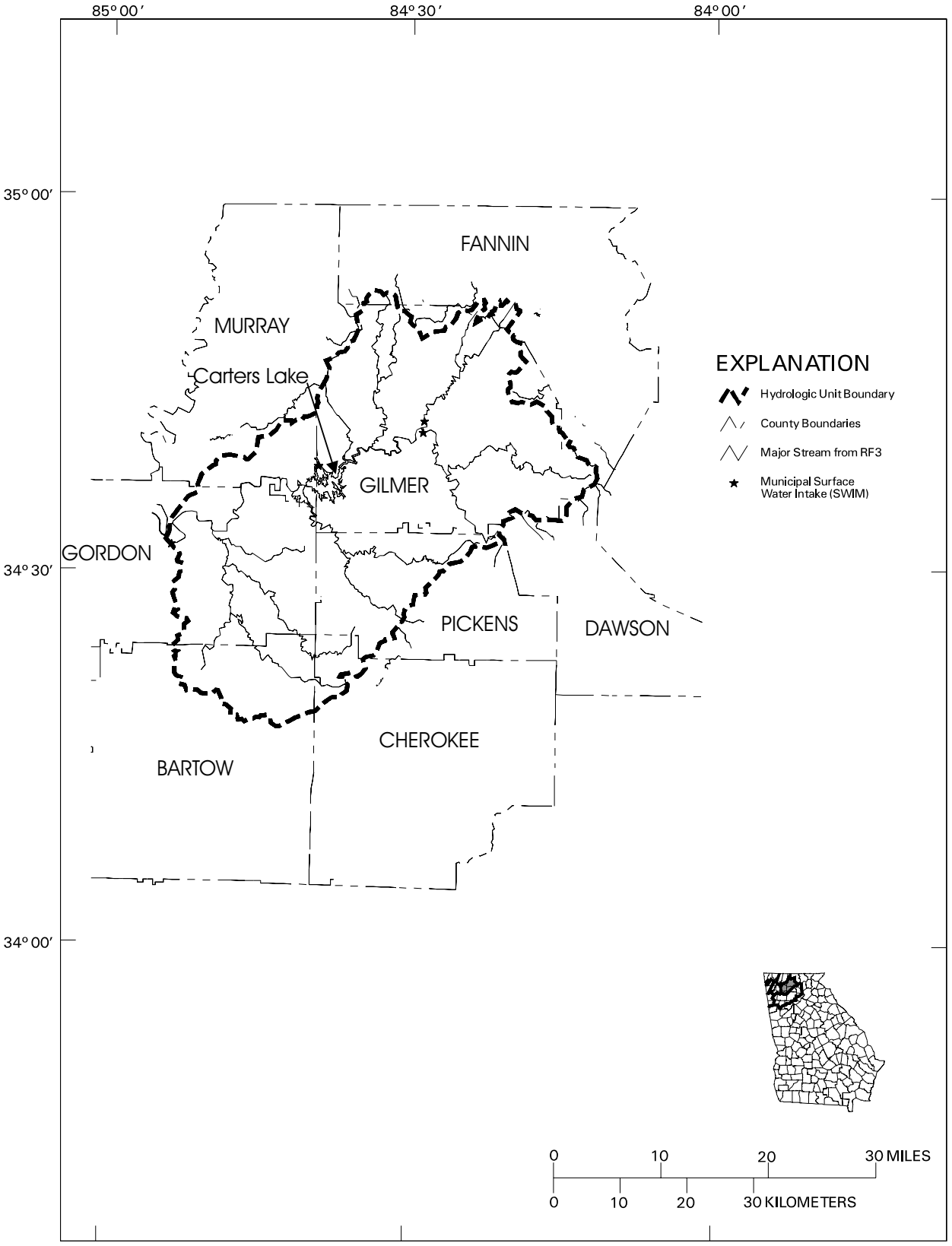

Figure 3-2. Surface Water Intakes, Coosa River Basin, HUC 03150102

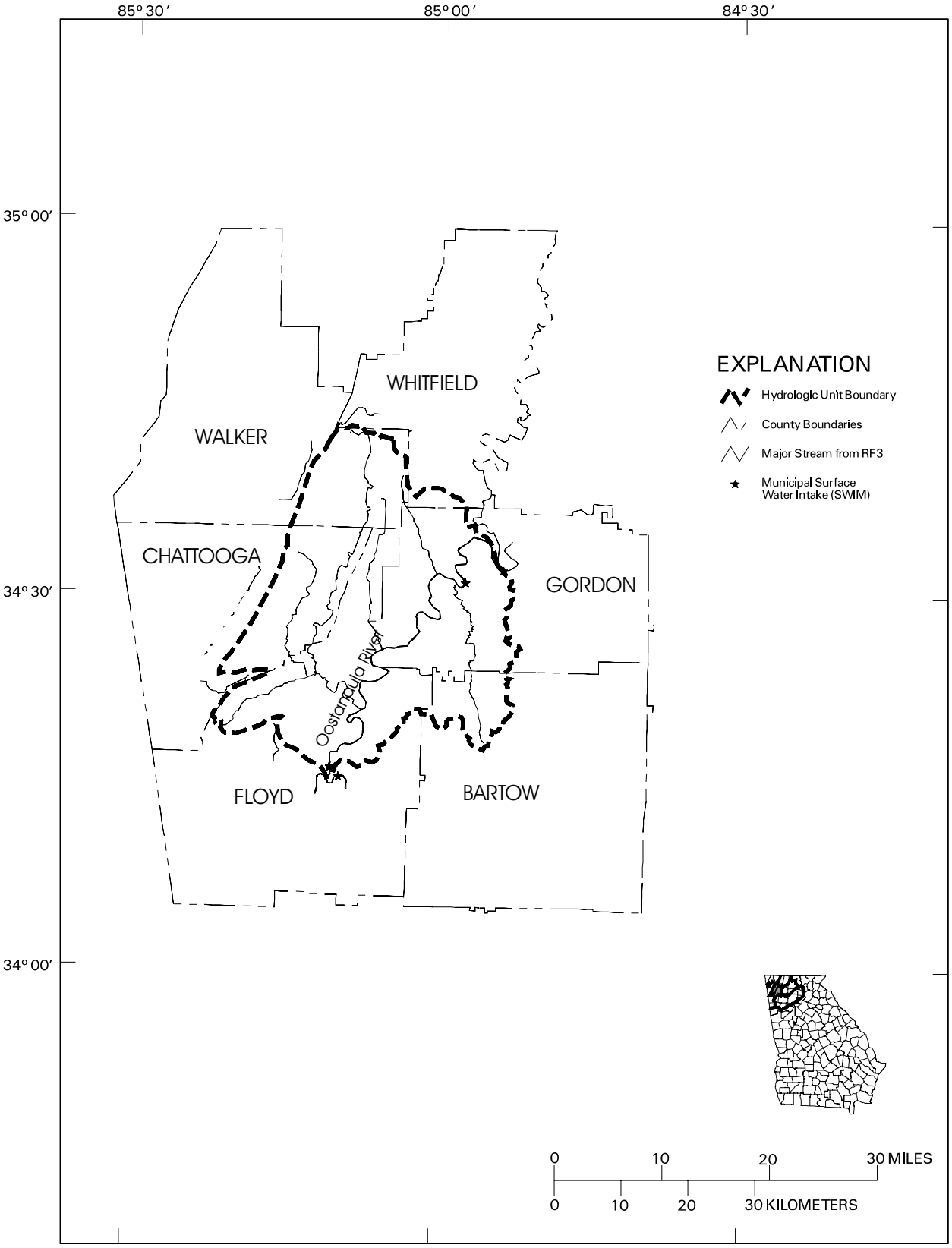

Figure 3-3. Surface Water Intakes, Coosa River Basin, HUC 03150103

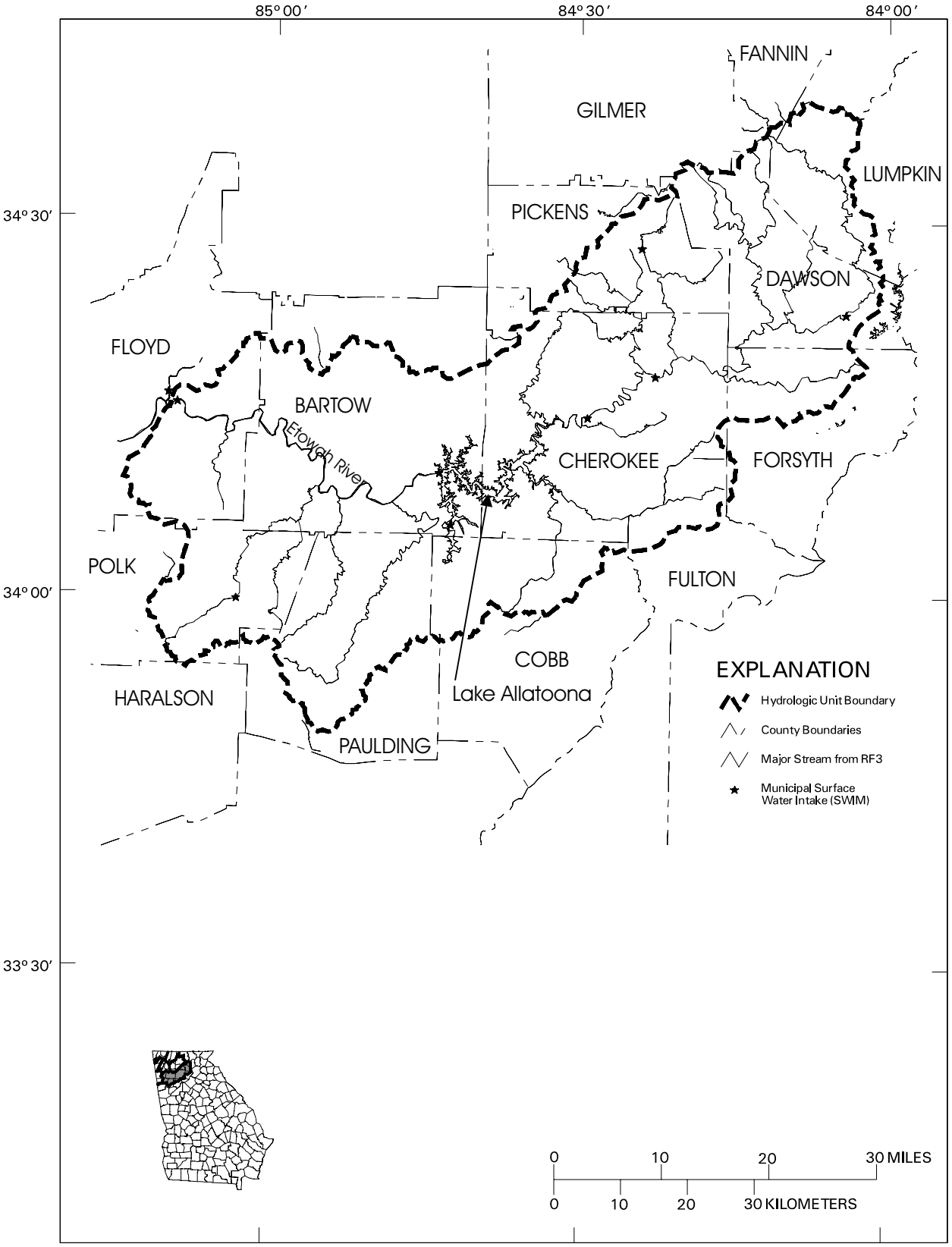

Figure 3-4. Surface Water Intakes, Coosa River Basin, HUC 03150104

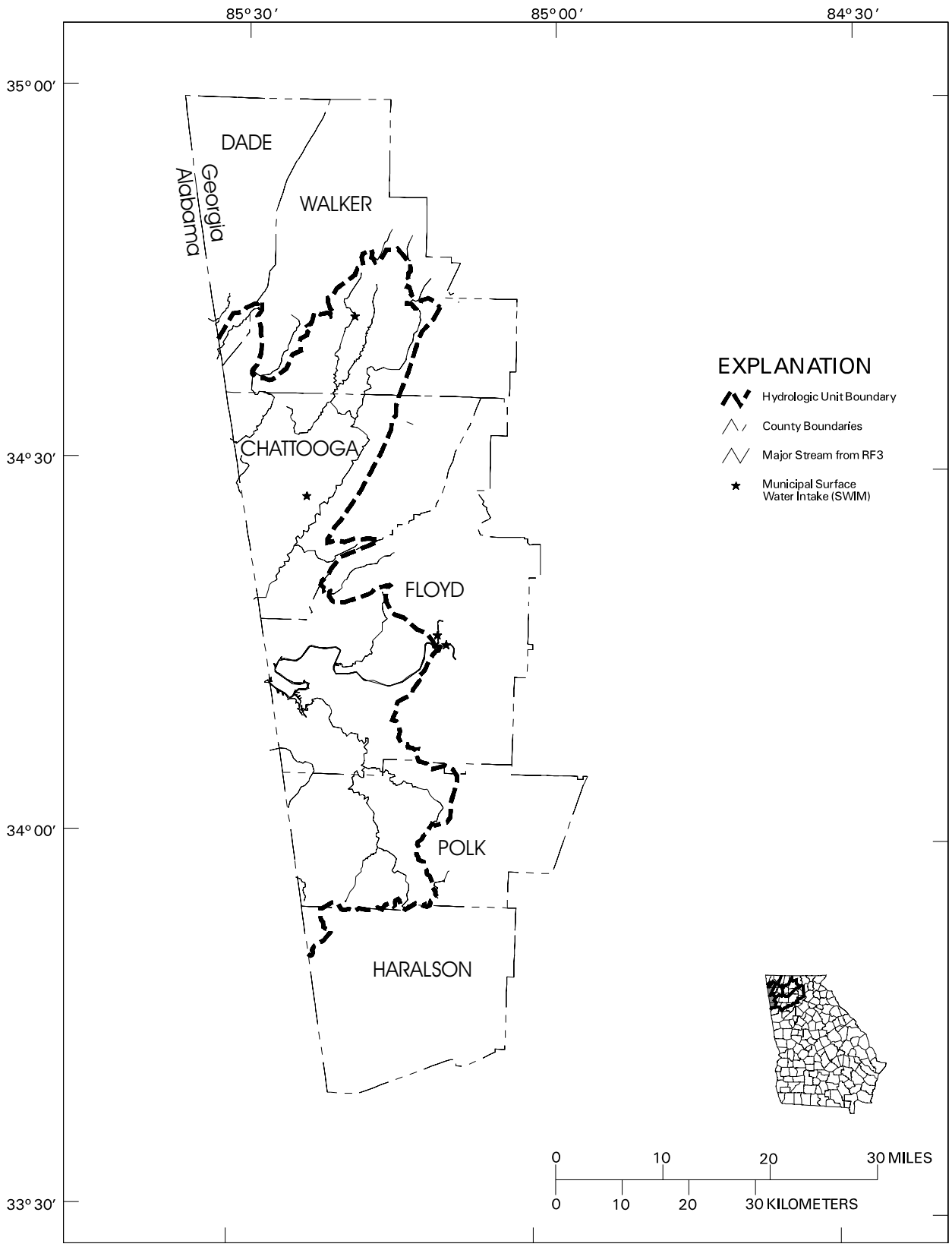

Figure 3-5. Surface Water Intakes, Coosa River Basin, HUC 03150105

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 135 active and permitted systems in the Coosa River basin.

3.2 Surface Water Quantity

3.2.1 Surface Water Supply Sources

Surface water supplies in the Coosa basin include water in rivers, ponds, and reservoirs, including two major impoundments on the Coosawattee and Etowah Rivers (see Section 2.1.4). The total mean annual flow in the Coosa River at the Alabama state line is approximately 8,000 MGD. Reservoirs provide a storage capacity within the basin of approximately 1.4 x 10^6 million acre-feet.

3.2.2 Surface Water Supply Demands and Uses

Municipal and Industrial Demand

Municipal and industrial (M&I) water demands include publicly supplied and privately supplied residential, commercial, governmental, institutional, industrial, manufacturing, and other demands such as distribution system water losses. Total M&I water demand from the Georgia part of the Coosa basin (exclusive of power generation cooling water) is expected to increase from 183 million gallons per day (MGD) in 1995 to 274 MGD in 2020 and to 383 MGD in 2050 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 Coosa River basin are shown in Table 3-2 (including permits for power generation cooling water) In 1990, the residential sector of the basin used about 28 percent of the M&I water, compared to 55 percent for the manufacturing sector.

Much of the M&I demand is not consumed, but is instead returned to the Coosa River basin as treated waste water.

Agricultural Water Demand

In 1995 approximately 124,700 acres in the Georgia portion of the Coosa River basin were devoted to the production of crops, orchards, turf, nursery, and aquaculture. 5,600 of these acres were irragated. The number of irrigated acres in the Coose basin is expected to increase to 6,700 by year 2000.

When averaged over a year, the 1995 agricultural water demand for counties in the Georgia part of the Coosa River basin was 18.6 MGD (see Table 3-3). The agricultural water demand in the basin is expected to increase to 20.0 MGD in 2000 and to 22.9 MGD in 2010 (NRCS, 1996).

In the Coosa 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 3-2. Permits for Surface Water Withdrawals in the Coosa River Basin

Facility Name	Source	24 Hour Maximum (MGD)	Monthly Average (MGD)	County
Adairsville, City of	Lewis Spring	5.10	4.10	Bartow
Baroid Drilling Fluids, Inc.	Etowah River	3.40	2.50	Bartow
Bartow County Water System	Bolivar Springs	0.51	0.43	Bartow
Bent Tree Community, Inc.	Lake Tamarack	0.25	0.23	Pickens
Bent Tree Corporation	Chestnut Cove Creek	0.25	0.23	Pickens
Berry Schools, The	Possum Trot Reservoir	1.00	0.70	Floyd
Big Canoe Utilities Company	Pettit Lake	1.00	1.00	Pickens
Big River Industries, Inc. (Revoked)	Simpson Creek	0.87	0.58	Polk
Birmingham Southeast, L.L.C.	Pettit Creek	1.00	0.60	Bartow
Calhoun, City of	City of Calhoun Spring	0.64	0.54	Gordon
Calhoun, City of	Oostanaula River	13.20	9.00	Gordon
Calhoun, City of - Coosawattee	Coosawattee River	18.00	16.00	Gordon
Canton, City of	Etowah River	5.45	5.45	Cherokee
Cartersville, City Of, Water Department	Etowah River	26.42	23.00	Bartow
Cartersville, City Of, Water Department	Lake Allatoona	21.42	18.00	Bartow
Cave Spring, City of	Cave Spring	1.50	1.30	Floyd
Cedartown, City of	Big Spring	3.00	2.60	Polk
Chatsworth Water Works Comm-eton	Eton Springs	1.80	1.80	Murray
Chatsworth Water Works Comm-holly	Holly Creek	1.10	1.00	Murray
Chatsworth, City of	Carters Lake	2.55	2.30	Murray
Chatsworth, City of	Coosawattee River	2.20	2.00	Murray
Cherokee County Water & Sewerage Auth	Etowah River	6.50	5.40	Cherokee
Cobb Co - Marietta Water Auth	Lake Allatoona	86.00	78.00	Cobb
Dalton Utilities - Coahulla Cr	Coahulla Creek	6.00	5.00	Whitfield
Dalton Utilities - Conasauga R	Conasauga River	49.40	40.30	Whitfield
Dalton Utilities - Freeman Springs	Freeman Springs	2.00	1.50	Whitfield
Dalton Utilities - Mill Cr	Mill Creek	13.20	7.50	Whitfield
Dalton Utilities - River Road	Conasauga River	35.00	18.00	Whitfield
Ellijay, City of - Ellijay R	Ellijay River	0.55	0.45	Gilmer
Ellijay-gilmer Co W & S Auth	Cartecay River	4.00	4.00	Gilmer
Emerson, City of	Moss Springs	0.63	0.50	Bartow
Etowah Water & Sewer Auth	Etowah River	1.50	1.50	Dawson
Floyd County	Old Mill Spring	4.00	3.50	Floyd
Galey & Lord, Inc.- Brighton Plant	Woodward Creek	0.80	0.70	Floyd

Facility Name	Source	24 Hour Maximum (MGD)	Monthly Average (MGD)	County
Georgia Power Co - Bowen	Etowah River	520.00	85.00	Bartow
Georgia Power Co - Plant Hammond	Coosa River	655.00	655.00	Floyd
Gold Kist, Inc	Etowah River	3.00	2.50	Cherokee
Inland-rome Inc.	Coosa River	32.00	30.00	Floyd
Jasper, City of	Long Swamp Creek	1.00	1.00	Pickens
Jefferson Smurfit Corporation	Big Spring Branch	0.18	0.07	Polk
La Fayette, City of - Dry Cr	Dry Creek	1.00	0.90	Walker
La Fayette, City Of- Big	Big Spring	1.65	1.31	Walker
Lindale Manufacturing, Inc	Silver Creek	6.52	6.52	Floyd
Mohawk Carpet Corporation	Chattooga R./Raccoon Cr.	3.20	2.80	Chattooga
Mount Vernon Mills Riegel Apparel Div	Trion Spring	9.90	6.60	Chattooga
New Riverside Ochre Company, Inc.	Etowah River	4.00	4.00	Bartow
New Riverside Ochre Company, Inc.	Etowah River	3.00	3.00	Bartow
O. Wayne Rollins	Pettit Creek	1.50	1.30	Bartow
Oglethorpe Power Corp.	Heath Creek			Floyd
Polk County Water Authority	Aragon, Morgan, Mulcos	1.60	1.10	Polk
Polk County Water Authority	Deaton Spring	2.00	2.00	Polk
Rockmart, City of	Euharlee Creek	2.00	1.50	Polk
Rome, City of	Oostanaula & Etowah River	16.50	15.00	Floyd
Summerville, City of	Lowe Spring	0.77	0.70	Chattooga
Summerville, City of	Raccoon Creek	3.00	2.50	Chattooga

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

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

Year	Total Water Demand (MGD)
1995	18.6
2000	20.0
2010	22.9
2020	23.9
2050	27.6

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 three power-generating plants located within the Coosa River basin that use the water resources of the basin (Figure 2-9). These include the Corps of Engineers hydroelectric facilities at Lake Allatoona on the Etowah River and at Carters Lake on the Coosawattee River. Georgia Power operates a fossil fuel plant (Plant Bowen) on the

Etowah River downstream of Allatoona. Instream water use by the two hydroelectric plants constitutes nearly the entire flow within the rivers, except during flood conditions, but is nonconsumptive. Water for thermoelectric-power generation is considered an off-stream use of water, and generally is moderately consumptive to nonconsumptive. Power generated at Plant Bowen had a consumptive demand of 32 MGD in 1990. Plant Bowen's water demand is projected to be 41 MGD in 2010.

Navigational Water Demand

The Coosa River channel within Georgia is not currently used for commercial navigation purposes. The channel was authorized for navigation to Rome, Georgia in the Rivers and Harbors Act of 1945; however, the benefit/cost ratio of extending the channel was insufficient to justify investment at the federal level (USACE, 1996).

Recreation

Because of proximity to the largest metropolitan area in the southeast, portions of the Coosa River basin and its reservoirs and tributaries are heavily used for recreation. The upper part of the Coosa River basin contains two heavily used reservoirs, national forests, and state parks. For example, Lake Allatoona, located northwest of Atlanta had nearly 500,000 boat trips in 1995, and one of the highest visitation rates among U.S. Army Corps of Engineers' reservoirs in the southeast.

The headwaters of the Coosa River rise in the scenic mountains of northwest Georgia. The Coosa River basin contains parts of the Chattahoochee National Forest, several state parks, and resort communities which are favorite weekend and vacation destinations. The Cohutta Wilderness provides hiking and trout fishing recreation in Fannin county, and rivers such as the Cartecay, Etowah, Coosawattee, and Talking Rock Creek provide quality canoeing experiences.

Recreational fisheries of the Coosa River basin include a cold-water trout fishery in the mountains above Lake Allatoona and Carters Lake. Warm-water recreational fisheries exist in the remainder of the Coosa River basin for various species of bass, catfish, and sunfish. Recreational fishing activities in Lake Allatoona and Carters Lake support businesses and services, including bait and tackle shops, guide services, hotels, and restaurants.

Fish and Wildlife Water Demand

Two fish and wildlife management facilities are located in the Georgia portion of the Coosa basin: Arrowhead Public Fishing Area and Summerville Fish Hatchery (Ziewitz et al., 1996). Arrowhead Game Management and Public Fishing Area obtains water from Lovejoy Creek, a tributary of the Armuchee River. Monthly average water needs range from 0.074 MGD in January to 0.438 MGD in March and April, with an annual average of 0.35 MGD. WRD operates Summerville Fish Hatchery, which obtains its supply from ground water (springs). Monthly average water needs range from 1.34 MGD in October to 3.51 MGD in March, with an annual average of 2.19 MGD.

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 Coosa 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 Demands

EPD recognizes the importance of maintaining suitable aquatic habitat in Georgia's lakes and streams to support viable communities of fish and other aquatic organisms. Portions of the mainstem of the Coosa River have been altered by human activities, both physically and with regard to flows. From a water quantity perspective, aquatic habitat is adversely affected in some locations by unnatural extreme variations in lake levels and river flow, especially below Carters Lake and Lake Allatoona. 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 Coosa 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 can establish that their use existed prior to July 1, 1988, and when these applications are received prior to July 1, 1991, are "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 Coosa 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-Coosa-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 Coosa River basin is coincident with subarea 6 of this study (Robinson et al., 1996).

Ground water in Subarea 6 is drawn from three types of aquifers: solution-conduit aquifers in carbonate rocks such as limestone, fracture-conduit aquifers in sandstone, and fracture-conduit aquifers in crystalline rock. Only the first two aquifer types generally provide sufficient reliable yield for municipal and industrial use. Robinson et al. (1996) provide an analysis of the current ground-water use and general development potential within the Georgia portion of the Coosa basin. They estimated that 1990 ground water use was 1.1 percent of mean annual baseflow, 4.3 percent of average drought baseflow, and 4.7 percent of minimum drought baseflow, based on observations during the 1954 drought. In general, ground-water resources are underused throughout the basin. The rural population relies on ground water as the principal source of water supply, while more densely populated areas rely on surface water resources. However, wells supplied water to many communities prior to the development of large surface water reservoirs. In recent years, suburban communities have developed ground water supplies in response to curtailed surface water supplies.

Flows withdrawn from ground water within the basin generally represents an equal reduction in the ground water discharge to streams. While a large portion of the ground-water baseflow within the basin is untapped, use of this supply must be balanced by the need to maintain minimum flows in stream for the support of aquatic life and to provide assimilative capacity for waste discharges.

3.3.2 Ground Water Supply Demands

Municipal and Industrial Uses

Ninety-seven percent of the Coosa basin M&I water demand in 2005 is projected to be supplied by surface water withdrawals. The ground water withdrawals for M&I use are projected to be only 7 MGD in the Coosa basin. Ground water pumpage is expected to intercept some water that would have surfaced in the streams, and this amount can be viewed as ground water demand that is effectively supplied by surface water. This effect depends on the geology of the basin.

Agricultural Water Demand

Total agricultural water demand for the Coosa River basin is discussed above in Section 3.2.2, and is derived from both surface and ground water sources. In the Piedmont portion of the Coosa basin most agricultural water is used for livestock and poultry, and is supplied from surface water.

3.3.3 Ground Water Supply Permitting

Nonagricultural Permits

The Georgia Ground Water Use Act of 1972 requires permits from EPD for all nonagricultural 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. A list of active Georgia municipal and industrial ground water withdrawal permits is provided in Table 3-4.

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. 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 exception relevant to the Coosa River basin is that the processing of perishable agricultural products is considered a farm use. Agricultural withdrawal permits are too numerous to list in this document.

Applicants for these permits who can establish that their use existed prior to July 1, 1988, and when their applications are received prior to July 1, 1991, are “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.

Table 3-4. Active Municipal and Industrial Ground Water Withdrawal Permits in the Coosa River Basin

County	Permit #	Type	Permit User	Monthly Permitted Flow (MGD)	Yearly Permitted Flow (MGD)	Aquifer
Bartow	008-0001	Industrial	New Riverside Ocher Company, Inc.	0.108	0.108	Shady FM Wiesner FM
Bartow	008-0010	Industrial	Anheuser-Busch, Inc.	0.220	0.146	Paleozoic LS
Bartow	008-0008	Municipal	City of White	0.200	0.150	Paleozoic LS
Bartow	008-0007	Industrial	Riverside Products	0.240	0.200	Knox Group
Bartow	008-0006	Industrial	First Brands Corp.	0.720	0.450	Shady FM
Bartow	008-0002	Industrial	Goodyear Tire & Rubber Corp.	0.300	0.200	Conasauga FM
Bartow	008-0003	Industrial	Chemical Products Corporation	1.700	1.700	Shady FM
Bartow	008-0005	Industrial	Chemical Products Corporation	1.600	1.600	Shady FM
Chattooga	027-0001	Municipal	Chattooga Co. Water District #1	0.700	0.650	Paleozoic LS
Chattooga	027-0002	Municipal	Town of Lyerly	0.150	0.120	Conasauga FM Knox Group
Cherokee	028-0002	Industrial	Seaboard Farms	0.210	0.210	Crystalline Rock
Cherokee	028-0001	Municipal	City of Ball Ground	0.150	0.150	Crystalline Rock
Floyd	057-0001	Municipal	Floyd County	1.300	1.037	Knox Group
Gordon	064-0001	Industrial	Carriage Industries	0.500	0.500	Paleozoic LS
Gordon	064-0002	Municipal	City of Calhoun	2.600	2.600	Paleozoic LS
Gordon	064-0003	Industrial	Vulcan Materials Co.	2.500	2.500	Paleozoic LS
Gordon	064-0003	Industrial	Multifex Corporation	0.665	0.665	Conasauga FM
Murray	105-0001	Municipal	City of Chatsworth	1.440	1.440	Conasauga FM Knox Group
Pickens	112-0003	Municipal	Pickens Co. Water Authority	0.160	0.160	Crystalline Rock
Pickens	112-0001	Municipal	Big Canoe Corporation	0.300	0.300	Crystalline Rock
Pickens	112-0002	Municipal	City of Jasper	0.470	0.470	Crystalline Rock
Polk	115-0004	Municipal	City of Rockmart	1.500	1.500	Newala LS
Polk	115-0001	Municipal	Polk Co. Water Authority	1.000	1.000	Knox Group
Polk	115-0002	Industrial	Engineered Fabrics Corp.	0.170	0.150	Knox Group Newala LS
Polk	115-0003	Industrial	GEO Specialty Chemicals	2.500	2.500	Paleozoic LS
Walker	146-0010	Municipal	City of Lafayette	1.100	1.000	Knox Group
Walker	146-0009	Municipal	City of Lafayette	0.850	0.750	Paleozoic LS
Walker	146-0005	Municipal	Walker Co. Rural W&S Authority	0.200	0.200	Newala LS

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 ground water 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.

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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 Coosa River basin. Section 4.1 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 Non-discharging 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 are not intended to discharge wastewater effluent to surface waters, are also discussed in this section.

NPDES Permitted Wastewater Discharges

The EPD NPDES permit program regulates municipal and industrial waste 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 major municipal wastewater treatment plants with permitted discharges of 1 million gallons per day (MGD) or greater in the Coosa River basin. (Tennessee reports no upstream NPDES permits for discharges to surface water within the Coosa River basin.) The geographic distribution of dischargers is shown in Figure 4-1. In addition, there are discharges from a variety of smaller wastewater treatment plants, including both public facilities (small public water pollution control plants, schools, marinas, etc.) and private facilities (package plants associated with nonsewered developments and mobile home parks) with less than a 1-MGD flow. These minor discharges might have the potential to cause localized stream impacts, but they are relatively insignificant from a basin perspective. Approximately 130 MGD of treated wastewater is currently discharged from water pollution control plants in Georgia into the Coosa River or tributaries by permitted point source discharges, including municipal and industrial sources, but excluding non-contact cooling water from power generation. Almost 78 percent of the Georgia discharges occur in the Etowah River drainage (HUC 03150104) or in the Rome area (HUC 03150105). While the river provides a means to assimilate these treated wastewaters, the discharges are sources of a variety of environmental stressors which must be regulated and controlled to prevent degradation of the receiving water.

Municipal Wastewater Discharges

Municipal wastewater treatment plants are among the most significant point sources regulated under the NPDES program in the Coosa River basin, accounting for about 78 percent of the total point source effluent flow (exclusive of cooling water). These plants collect, treat, and release large volumes of 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 $170 million in construction and upgrade of municipal water pollution control plants in the Coosa 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 downstream water quality. As of the 1996-1997 water quality assessment, only three segments (38 miles) of river/streams were identified in which municipal discharges contributed to not fully supporting designated uses, all of which are being addressed through the NPDES permitting process.

Most urban wastewater treatment plants also receive industrial process and non-process wastewater, which can contain a variety of conventional and toxic pollutants. Approximately 80 percent of the flow to the Trion WPCP is attributed to process water from a textile mill. The control of industrial pollutants in municipal wastewater is addressed through pretreatment programs. The major publicly owned wastewater treatment plants in this basin have developed and implemented approved local industrial pretreatment programs. Through these programs, the wastewater treatment plants are required to establish effluent limitations for their significant industrial dischargers (those which discharge in excess of 25,000 gallons per day of process wastewater or are

Table 4-I. Major Municipal Wastewater Treatment Plant Discharges with Permitted Monthly Average Flows Greater than IMGD in the Coosa River Basin

NPDES Permit #	Facility Name	Authority	County	Receiving Stream	Permitted Monthly Average Flow (MGD)	Approved Expansions (MGD)
HUC 03150101 (Conasauga River Basin)						
GA0032492	Chatsworth WPCP	Chatsworth	Murray	Holly Creek, trib. Conasauga River	3.0	
HUC 03150102 (Coosawatee River Basin)						
GA0021369	Ellijay WPCP	Ellijay	Gilmer	Coosawattee River	2.5	
HUC 03150103 (Oostanaula River Basin)						
GA0030333	Calhoun WPCP	Calhoun	Gordon	Oostanaula River	12.00	16.0
HUC 03150104 (Etowah River Basin)						
GA0024091	Cartersville WPCP	Cartersville	Bartow	Etowah River	12.1	15.0
GA0025674	Canton WPCP	Canton	Cherokee	Etowah River	1.89	
GA0046451	Cherokee Co. Rose Creek WPCP	Cherokee Co.	Cherokee	Etowah River Arm of Lake Allatoona	4.0	
GA0024988	Noonday Water Reclamation Fac.	Cobb Co.	Cobb	Noonday Crk. trib. Lake Allatoona	12.0	
GA0046761	Northwest Water Reclamation Fac.	Cobb Co.	Cobb	Etowah River Arm of Lake Allatoona	4.0	
GA0026026	Dallas West WPCP	Dallas	Paulding	Weaver Creek trib.	0.9	
GA0026042	Rockmart WPCP	Rockmart	Polk	Euharlee Creek	3.0	
HUC 03150105 (Coosa River below Rome and Chattooga River Basin)						
GA0024074	Cedartown WPCP	Cedartown	Polk	Cedar Creek	3.5	
GA0024112	Rome WPCP	Rome	Floyd	Coosa River	18.0	
GA0024341	Rome Coosa WPCP	Rome	Floyd	Coosa River	2.0	
GA0025607	Trion WPCP	Trion	Chattooga	Chattooga River	5.0	
GA0025704	Summerville WPCP	Summerville	Chattooga	Chattooga River	2.0	
GA0025712	LaFayette WPCP	LaFayette	Walker	Chattooga Creek	3.5	5.0

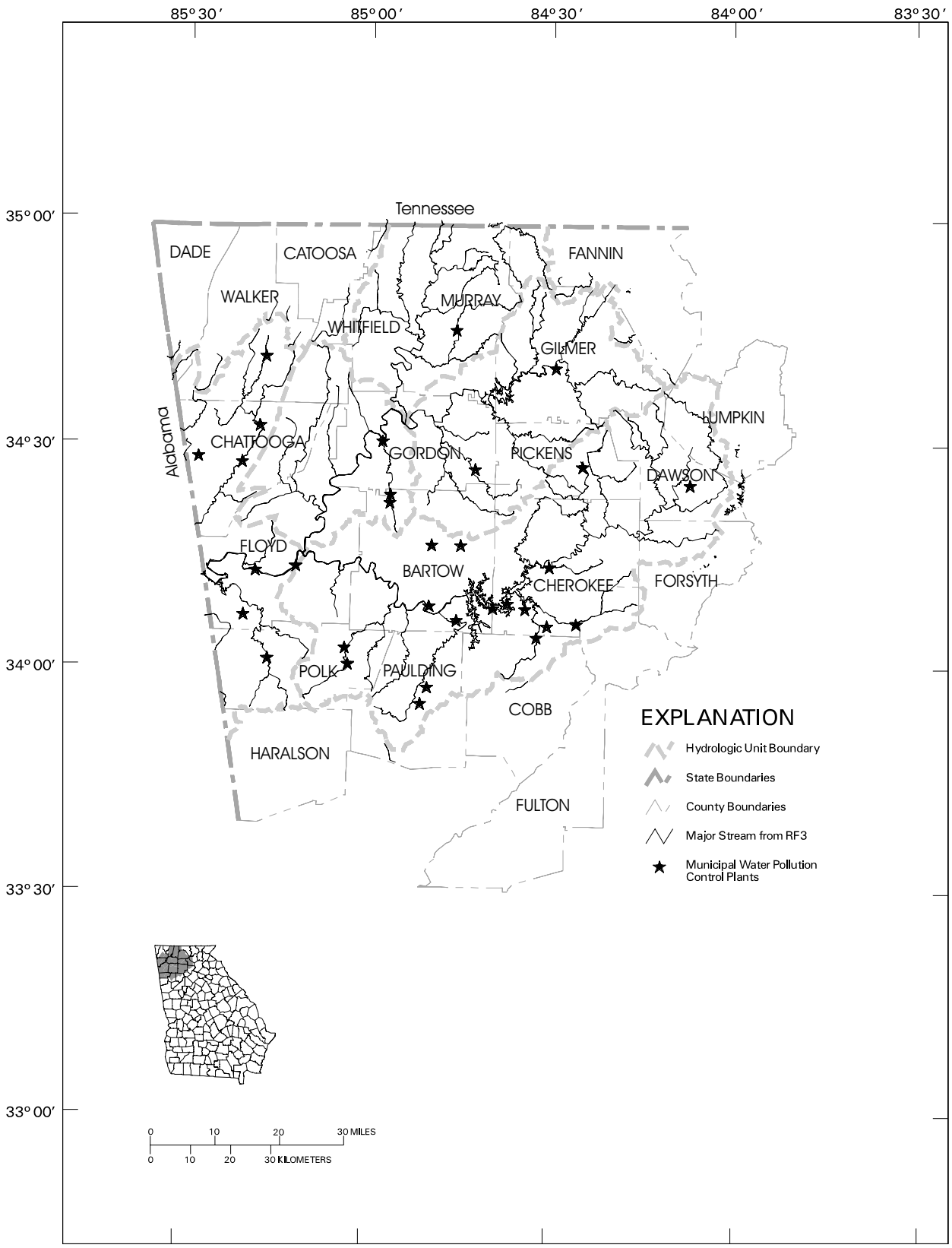

Figure 4-I. Location of Municipal Wastewater-Treatment Plants in the Coosa River Basin

regulated by a Federal Categorical Standard) and to monitor the industrial user's compliance with those limits. The treatment plants are able to control the discharge of organics and metals into their sewerage system through the controls placed on their 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 103 permitted municipal, state, federal, private, and industrial wastewater and process water discharges in the Coosa River basin, as summarized in Table 4-2. The complete permit list is summarized in Appendix D.

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

HUC	Major Municipal Facilities	Major Industrial and Federal Facilities	Minor Public Facilities	Minor Private and Industrial Facilities	*Total*
03150101	1	0	2	17	*20*
03150102	1	0	0	1	*2*
03150103	1	2	1	6	*10*
03150104	7	1	9	39	*56*
03150105	6	4	1	4	*15*
TOTAL	*16*	*7*	*13*	*67*	*103*

The flow rates for industrial dischargers in the Coosa basin are relatively low. However, the nature of industrial discharges varies widely compared to discharges from municipal plants. Industrial discharges can consist of organic heavy oxygen-demanding waste loads from facilities such as pulp and paper mills, large quantities of non-contact cooling water from facilities such as power plants, pit pumpout and surface runoff from mining and quarrying operations, 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 1996-1997 water quality assessment report identified 3 segments (5 miles) of river/streams in the Georgia portion of the basin where permitted industrial discharges contributed to a failure to support designated uses. These segments are being addressed through the NPDES permitting process. Table 4-3 lists the major industrial and federal wastewater treatment plants with discharges into the Coosa River basin in Georgia.

There are also 67 minor industrial and private discharges which may have the potential to cause localized stream impacts, but these are relatively insignificant from a basin perspective. The locations of permitted point source discharges of treated wastewater in the Coosa River basin are shown in Figures 4-2 through 4-6.

Combined Sewer Overflows

Combined sewers are sewers that carry both storm water runoff and sanitary sewage in the same pipe. Most of these combined sewers were built at the turn of the century and were present in most large cities. At that time both sewage and storm water runoff were piped from the buildings and streets to the small streams that originated in the heart of the city. When these streams were enclosed in pipes, they became today's combined sewer systems. As the cities grew, their combined sewer systems expanded. Often new combined sewers were laid to move the untreated wastewater discharge to the outskirts of the town or to the nearest waterbody.

Table 4-3. Major Industrial NPDES Facilities in the Coosa River Basin

NPDES Permit #	Facility Name	Description	Flow and Load	Receiving Stream
HUC 03150103: Oostanaula River Basin				
GA0000329	Goodyear Tire Co., Gordon Co.	Wastewater from rubber and rubber products manufacture	Average 0.16 MGD BOD-5: 46 lb/day TSS: 45 lb/day Ammonia: 21 lb/day	Oothkalooga River
GA0024155	GE Co., Rome, Floyd Co.	Treated storm water runoff	Average 0.8 MGD PCBs: 0.013 lb/day	Horse Creek, Little Dry Creek
HUC 03150104: Etowah River Basin				
GA0001449	Georgia Power, Plant Bowen, Bartow Co.	Wastewater from power generation by coal and oil	Average 17.5 MGD BOD-5: 4,378.5 lb/day TSS: 4,378.5 lb/day Arsenic: 0.22 lb/day Copper 6.13 lb/day Selenium 0.267 lb/day	Euharlee Creek, Etowah River
HUC 03150105: Coosa River Basin below Rome and Chattooga River Basin				
GA0001708	Georgia Specialty Chemicals, Polk Co.	Wastewater from manufacture of organic chemicals	Average 2.3 MGD BOD-5: 135 lb/day TSS: 141 lb/day Ammonia: 66 lb/day	Cedar Creek, Big Spring Creek
GA0001104	Inland Container Corp., Floyd Co.	Wastewater from manufacture of pulp and paper.	Average 26.0 MGD BOD-5: 13,400 lb/day TSS: 32,000 lb/day	Smith Cabin Creek
GA0001457	Georgia Power, Plant Hammond, Floyd Co.	Cooling water from steam electric power generation	Average 580 MGD No significant pollutant loads.	Coosa River
GA0024104	Mohawk Carpets, Chattooga Co.	Wastewater from manufacture of carpets.	Average 3.0 MGD BOD-5: 400 lb/day TSS: 2,350 lb/day Chromium: 8.5 lb/day	Chattooga River

In later years wastewater treatment facilities were built and smaller sanitary sewers were constructed to carry the sewage (dry weather flows) from the termination of the combined sewers to these facilities for treatment. 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. Uncontrolled CSOs thus discharge raw diluted sewage, and can introduce elevated concentrations of bacteria, BOD, and solids into a receiving water body. In some cases, CSOs discharge into relatively small creeks.

CSOs are considered a point source of pollution and are subject to the requirements of the Clean Water Act. Although CSOs are not required to meet secondary treatment effluent limits, sufficient controls are required to protect water quality standards for the designated use of the receiving stream. In the 1990 session of the Georgia Legislature, a CSO law was passed requiring all Georgia cities to eliminate or treat CSOs. There are two cities in the Coosa River basin that formerly had CSOs: the City of Rome and the City of Cedartown. Both cities have recently completed removal of their CSOs, as described below.

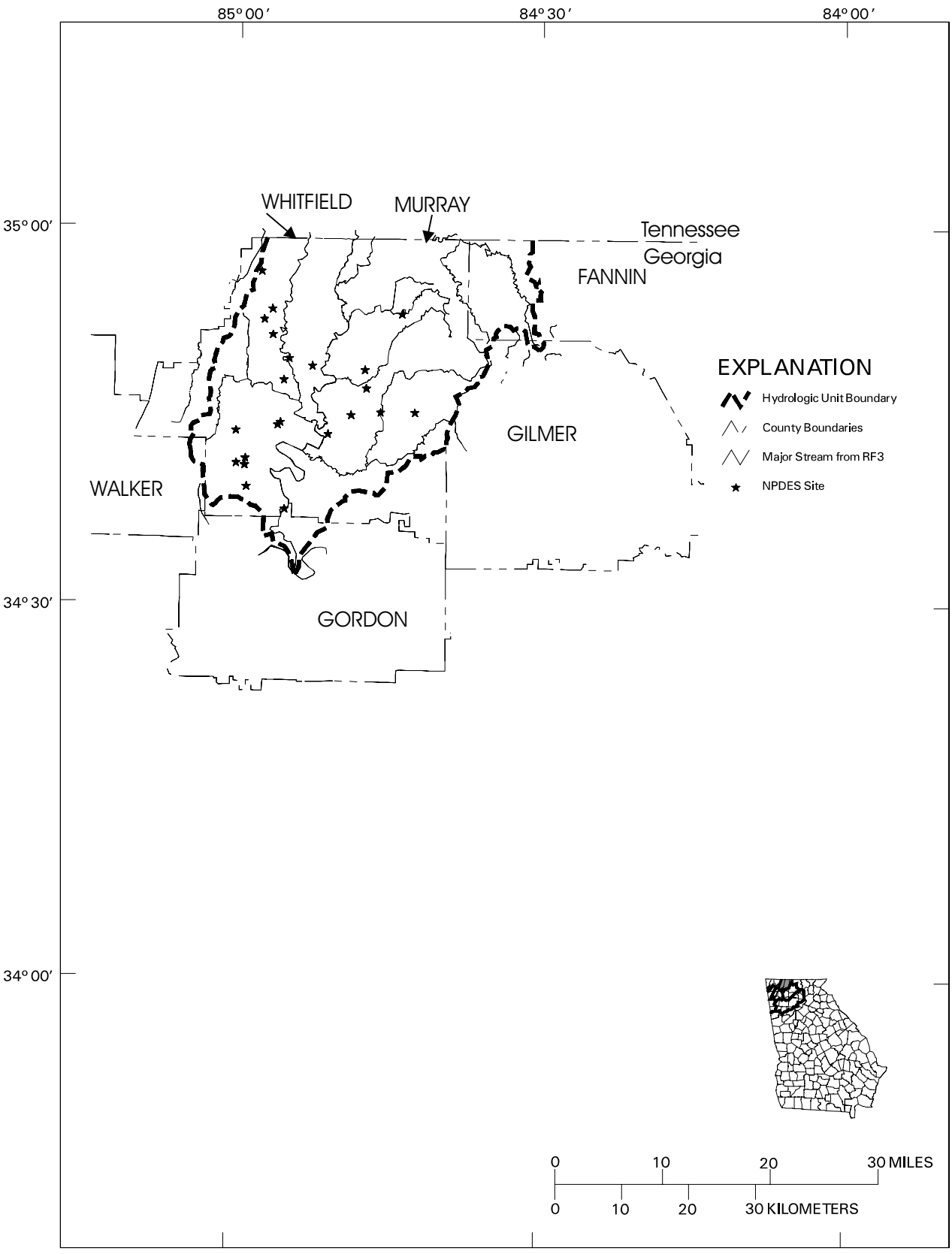

Figure 4-2. NPDES Sites Permitted by GAEPD, Coosa River Basin, HUC 03150101

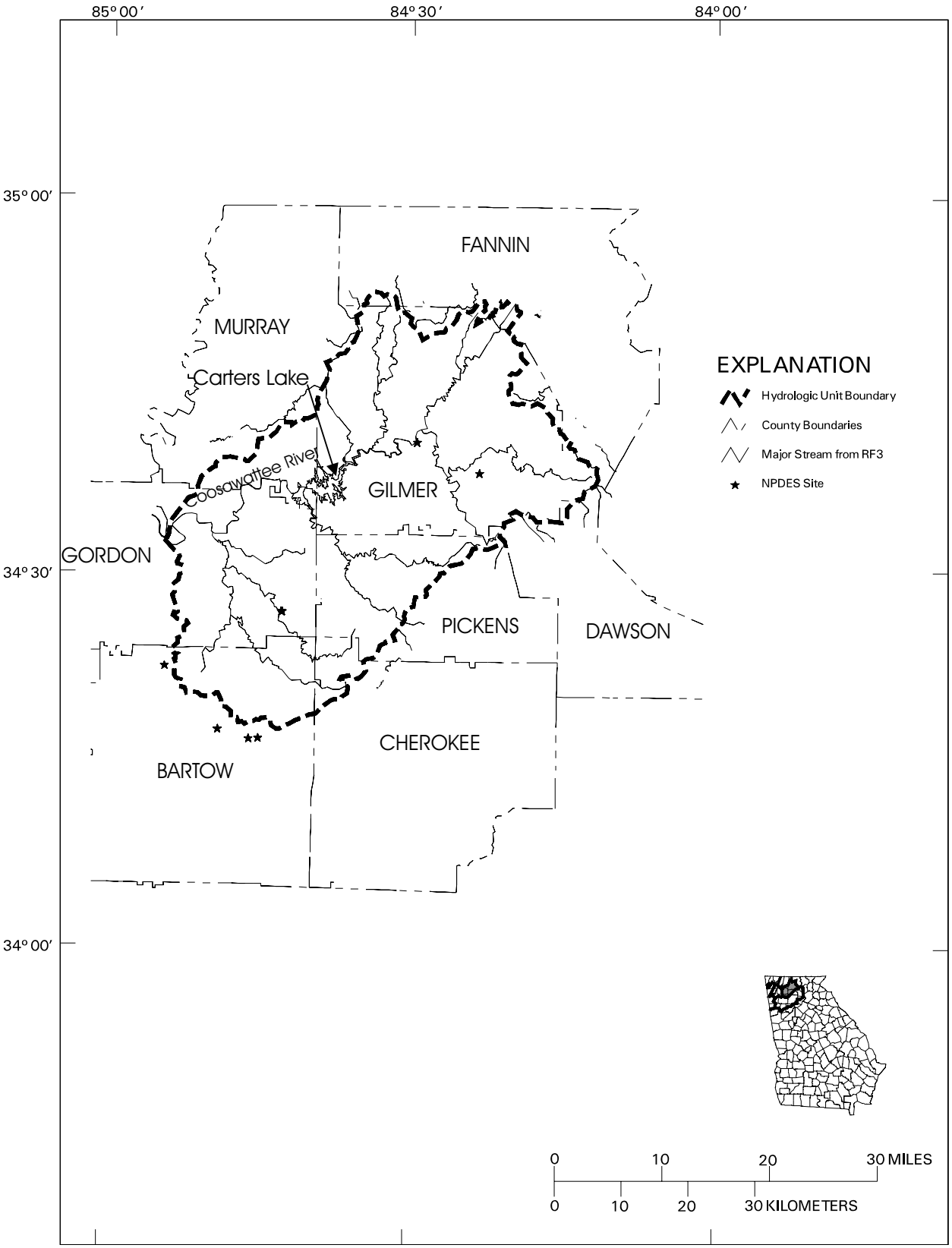

Figure 4-3. NPDES Sites Permitted by GAEPD, Coosa River Basin, HUC 03150102

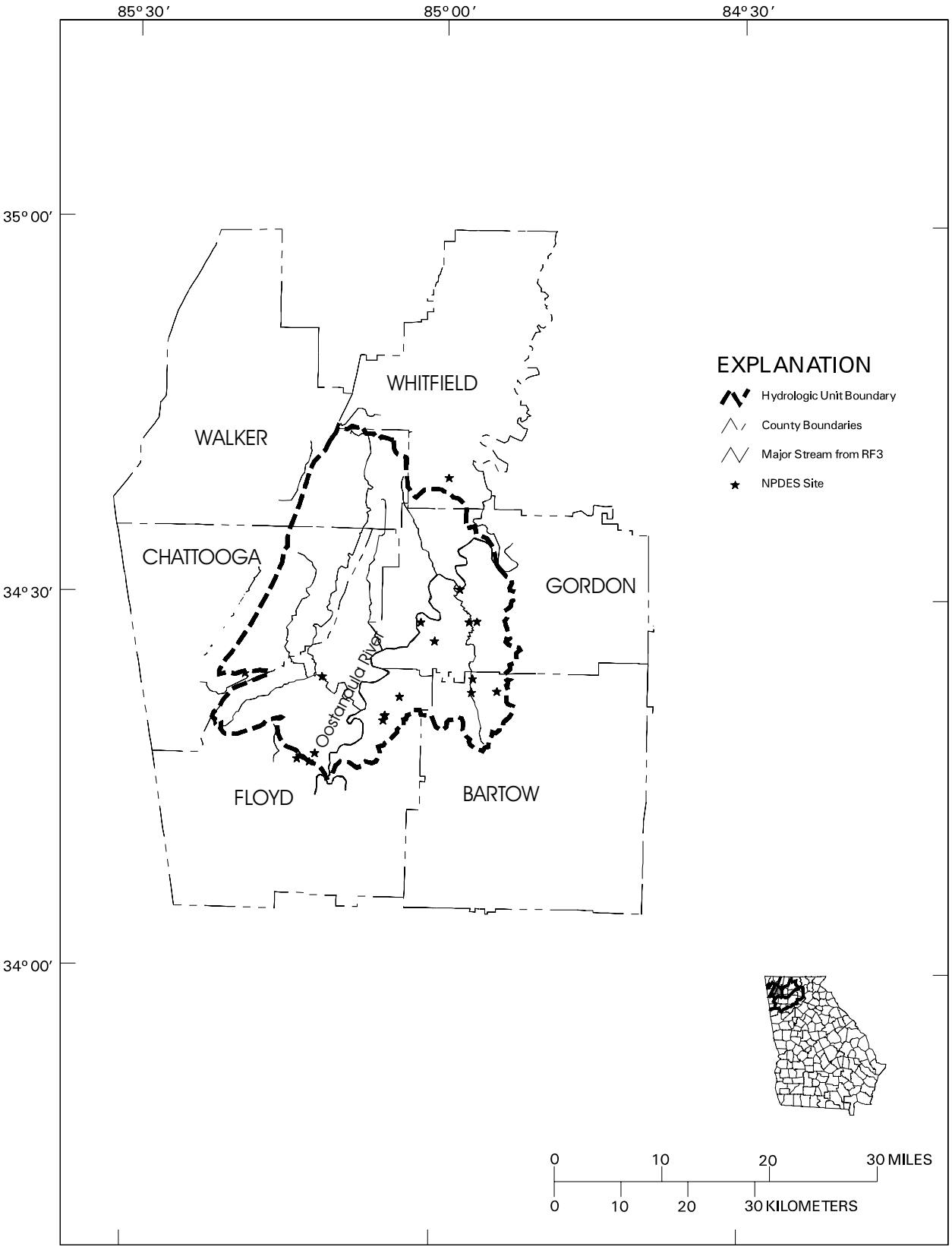

Figure 4-4. NPDES Sites Permitted by GAEPD, Coosa River Basin, HUC 03150103

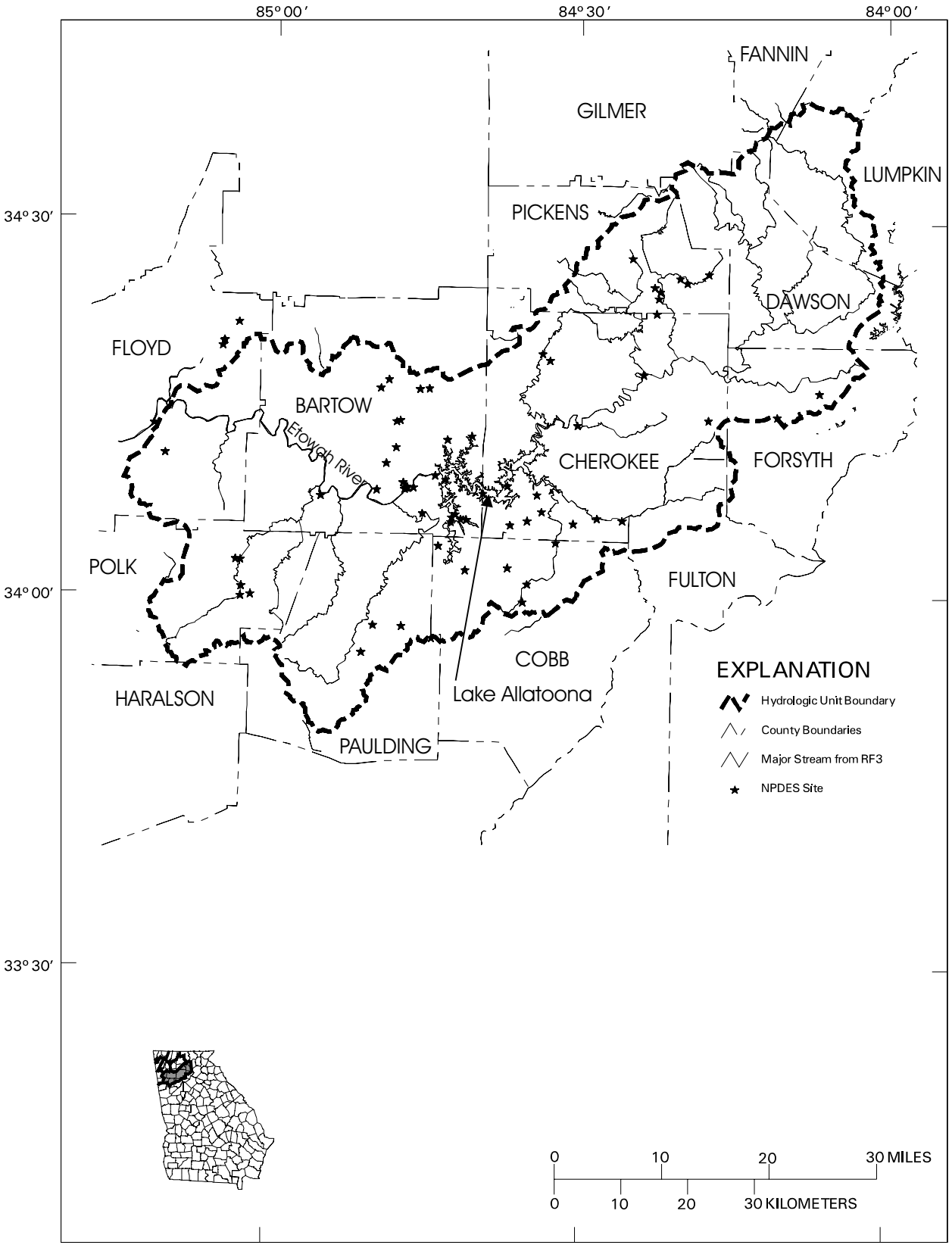

Figure 4-5. NPDES Sites Permitted by GAEPD, Coosa River Basin, HUC 03150104

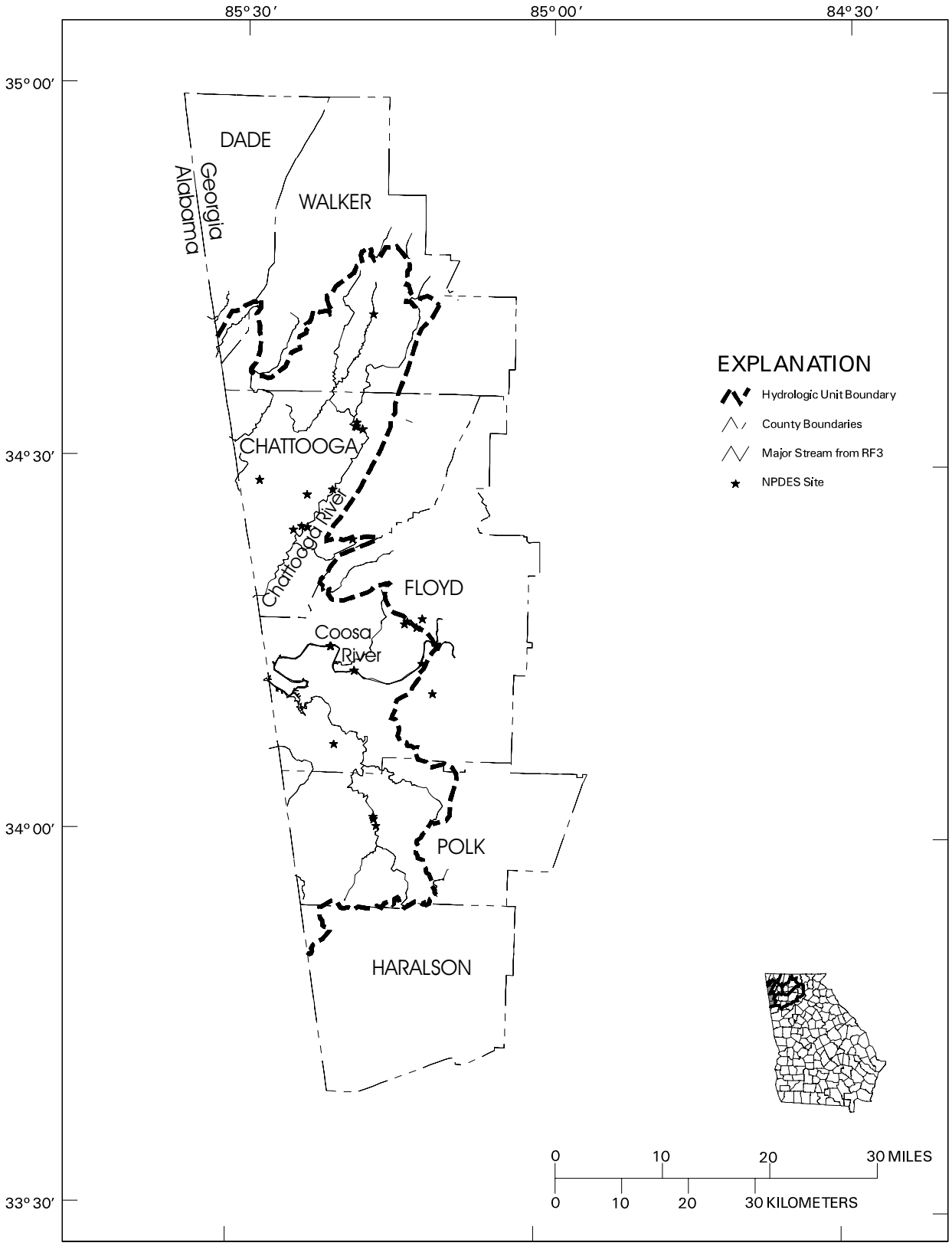

Figure 4-6. NPDES Sites Permitted by GAEPD, Coosa River Basin, HUC 03150105

Cedartown CSOs

The City of Cedartown began studying their CSOs in the late 1980s. Following the 1990 legislative action, the City of Cedartown developed a CSO control plan to eliminate overflow points within the sewage collection system into Cedar Creek. The CSO control plan identified four CSO overflow points. CSOs No. 1, 2 and 3 were located south of West Girard Avenue and north of Optimist Field adjacent to the Cedar Creek. CSO No. 4 was located near West Ave. And Cedar Creek. The CSO control plan proposed to physically eliminate the overflows by plugging the overflow pipes. On November 2, 1992 the City of Cedartown eliminated all four CSO overflows. On February 10, 1995 the CSO NPDES Permit No. GA0036846 for the City of Cedartown CSOs was rescinded by EPD.

Rome CSOs

The City of Rome began studying their CSOs in the early 1990s. Following the 1990 legislative action, the City of Rome developed a CSO control plan that involved the elimination of overflow points within the sewage collection system into the Etowah River and the Oostanaula River. The City identified six CSOs:

CSO No. 1 - 6th Avenue at Glenn Miller Boulevard adjacent to the Etowah River

CSO No. 2 - 2nd Avenue adjacent to the Etowah River

CSO No. 3 - 4th Street adjacent to the Etowah River

CSO No. 4 - 2nd Street at Southeastern Mills adjacent to the Etowah River

CSO No. 5 - 2nd Avenue adjacent to the Oostanaula River

CSO No. 6 - 6th Avenue at West 2nd Street adjacent to the Oostanaula River

After evaluating several CSO control options, the City of Rome chose to separate the storm and sanitary flows and then to transport the sanitary flow to a wastewater treatment facility.

On August 29, 1996 the City of Rome completed the CSO separation of all six CSOs. The City spent $2.5 million on these modifications and agreed to a negotiated settlement of $26,500 in accordance with the Consent Order No. EPD-WQ-3212. On September 20, 1996, the NPDES Permit No. GA0036862, Administrative Order No. EPD-WQ-1871 and Consent Order EPD-WQ-3212 was rescinded by EPD.

NPDES Permitted Storm Water Discharges

Urban storm water runoff in the Coosa basin has been identified as a major source of stressors from pollutants such as oxygen-demanding waste (BOD) and fecal coliform bacteria. Storm water may flow directly to streams as a diffuse, nonpoint process, or may 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 may also increase the temperature of a receiving stream during warm weather, which potentially threatens valuable trout fisheries in the Coosa River basin. 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. Permits in the Coosa basin are shown in Table 4-4.

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 (hard surfaces). 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, 369 NOIs had been filed for the Coosa basin. The distribution of NOIs by HUC is as follows:

HUC 03150101 (Conasauga River Basin)	116
HUC 03150102 (Coosawattee River Basin)	16
HUC 03150103 (Oostanaula River Basin)	43
HUC 03150104 (Etowah River Basin)	150
HUC 03150105 (Mainstem Coosa below Rome and Chattooga River Basin)	44

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, an 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 an LAS could malfunction and become a source of stressor loading.

Table 4-4. Permitted Municipal Separate Storm Sewer Systems, Coosa River Basin

Permittee	Permit #	Contact	Address	City	ZIP	County	Type	Issued	Expires	HUC
Acworth	GAS000101	Ms. Frana Brown, City Clerk	4375 Senator R. B. Russell Square	Acworth	30101	Cobb	Large/Independent	19940615	19990614	03150104 (Etowah)
Alpharetta	GAS000102	Mr. Jarvis Middleton, Public Works Dept.	82 Haynes Bridge Rd.	Alpharetta	30201	Fulton	Large/Independent	19940615	19990614	03150104 (Etowah)
Cobb County	GAS000108	Henry Mingledorff, Cobb County Water System	680 South Cobb Dr., Building 3	Marietta	30060	Cobb	Large/Independent	19940615	19990614	03150104 (Etowah)
Fulton County	GAS000117	Earl Burrell, Public Works Dept.	141 Pryor St., SW, Suite 6001	Atlanta	30303	Fulton	Large/Independent	19940615	19990614	03150104 (Etowah)
Kennesaw	GAS000121	Martin Poole, Public Works Dept.	3080 Moon Station Rd.	Kennesaw	30144	Cobb	Large/Independent	19940615	19990614	03150104 (Etowah)
Marietta	GAS000125	Russell Moorehead, Public Works Dept.	205 Lawrence St.	Marietta	30060	Cobb	Large/Independent	19940615	19990614	03150104 (Etowah)
Roswell	GAS000131	Scott Forward, Engineering Division	38 Hill St., Suite C-50	Roswell	30075	Fulton	Large/Independent	19940615	19990614	03150104 (Etowah)

A total of 128 municipal and 35 industrial permits for land application systems were in effect in Georgia in 1998. Municipal and other major wastewater land application systems (permitted flow greater than 0.01 MGD) within the Coosa Basin are listed in Table 4-5. The locations of all LASs within the basin are shown in Figures 4-7 through 4-11. The only LAS with a flow greater than 1 MGD is Dalton Utilities LAS, which is permitted to land apply up to 40.0 MGD of treated wastewater effluent to its 3,600 acres of spray fields. More than 85 percent of the influent wastewater is industrial process wastewater. Dalton Utilities wastewater treatment processes include preliminary treatment, biological treatment (activated sludge), and secondary clarification. Dalton Utilities also administers and implements a local pretreatment program.

Table 4-5. Wastewater Land Application Systems in the Coosa River Basin

Operator	Location	Permit No.	Permitted Flow (MGD)
HUC 03150101 (Conasauga River Basin)			
Dalton Utilities	Whitfield Co.	GA02-056	40.0
HUC 03150104 (Etowah River Basin)			
DNR Red Top Mountain	Bartow Co.	GA02-237	0.022
Etowah Water and Sewer	Dawson Co.	GA02-232	0.180
Dawsonville LAS	Dawson Co.	GA02-179	0.120
DNR Amicalola Falls LAS	Dawson Co.	GA02-045	0.022
Chestatee Development LAS	Dawson Co.	GA02-192	0.075
Fulton Co. Little River LAS	Cherokee Co.	GA02-170	0.200
Cherokee Little River/Fitz.	Cherokee Co.	GA02-278	0.170
Lake Arrowhead Utility Co.	Cherokee Co.	GA03-819	0.300
Chapel Knoll	Paulding Co.	GA03-944	0.010

Landfills

Permitted landfills are required to contain and treat any leachate or contaminated runoff 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 but is not currently practiced at any landfills in Georgia. Groundwater 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 location of permitted landfills within the basin is shown in Figures 4-12 through 4-16 and Table 4-6.

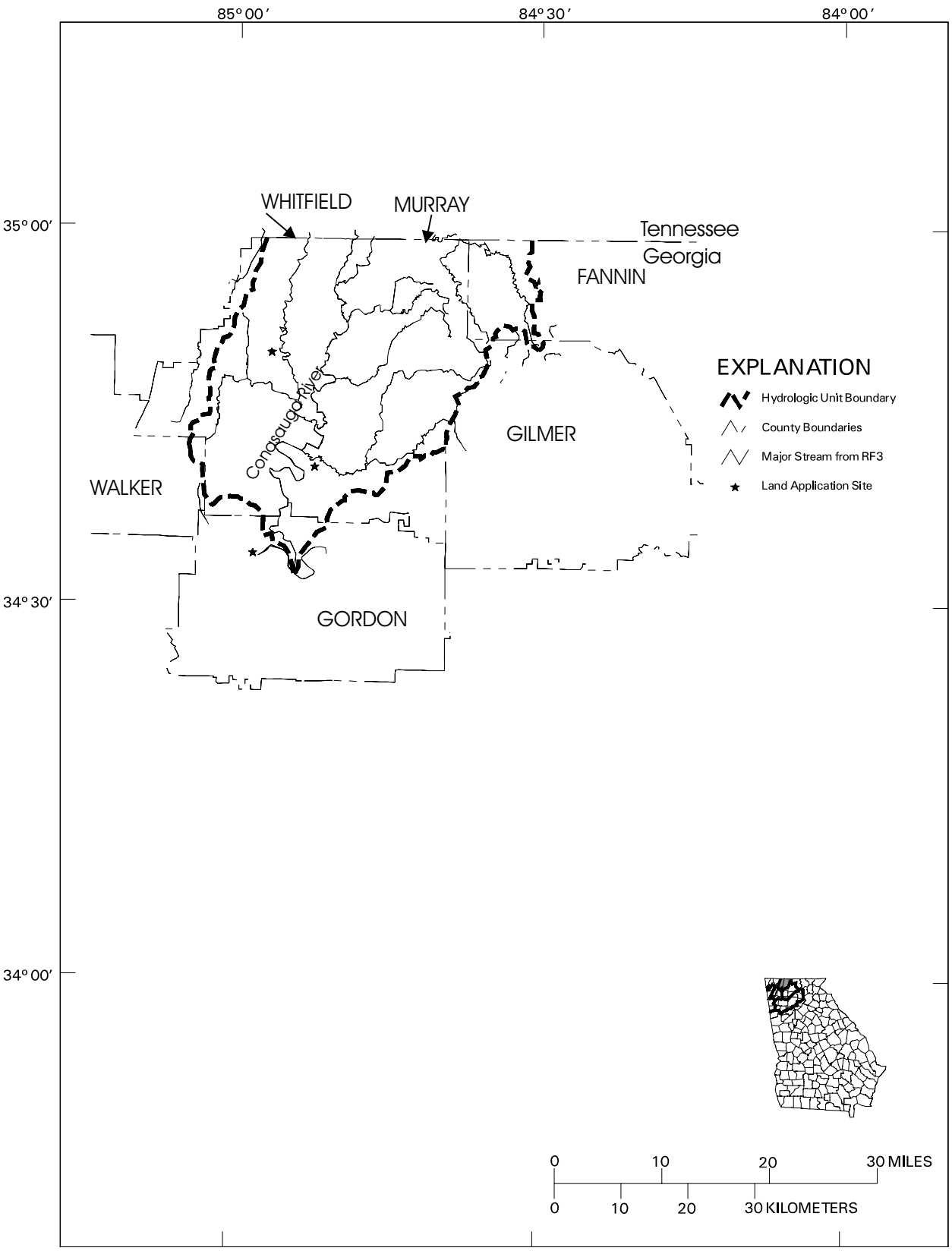

Figure 4-7. Land Application Systems, Coosa River Basin, HUC 03150101

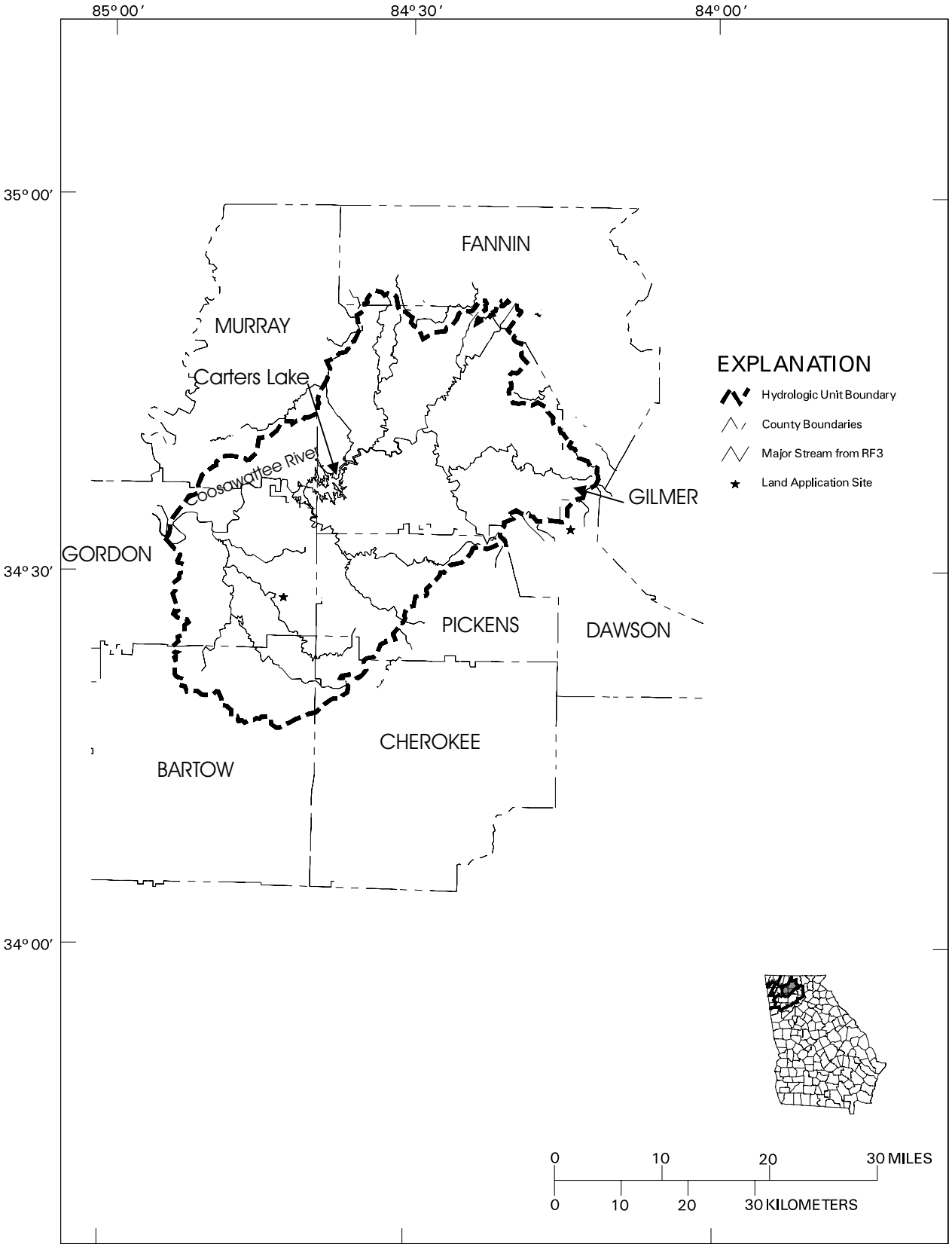

Figure 4-8. Land Application Systems, Coosa River Basin, HUC 03150102

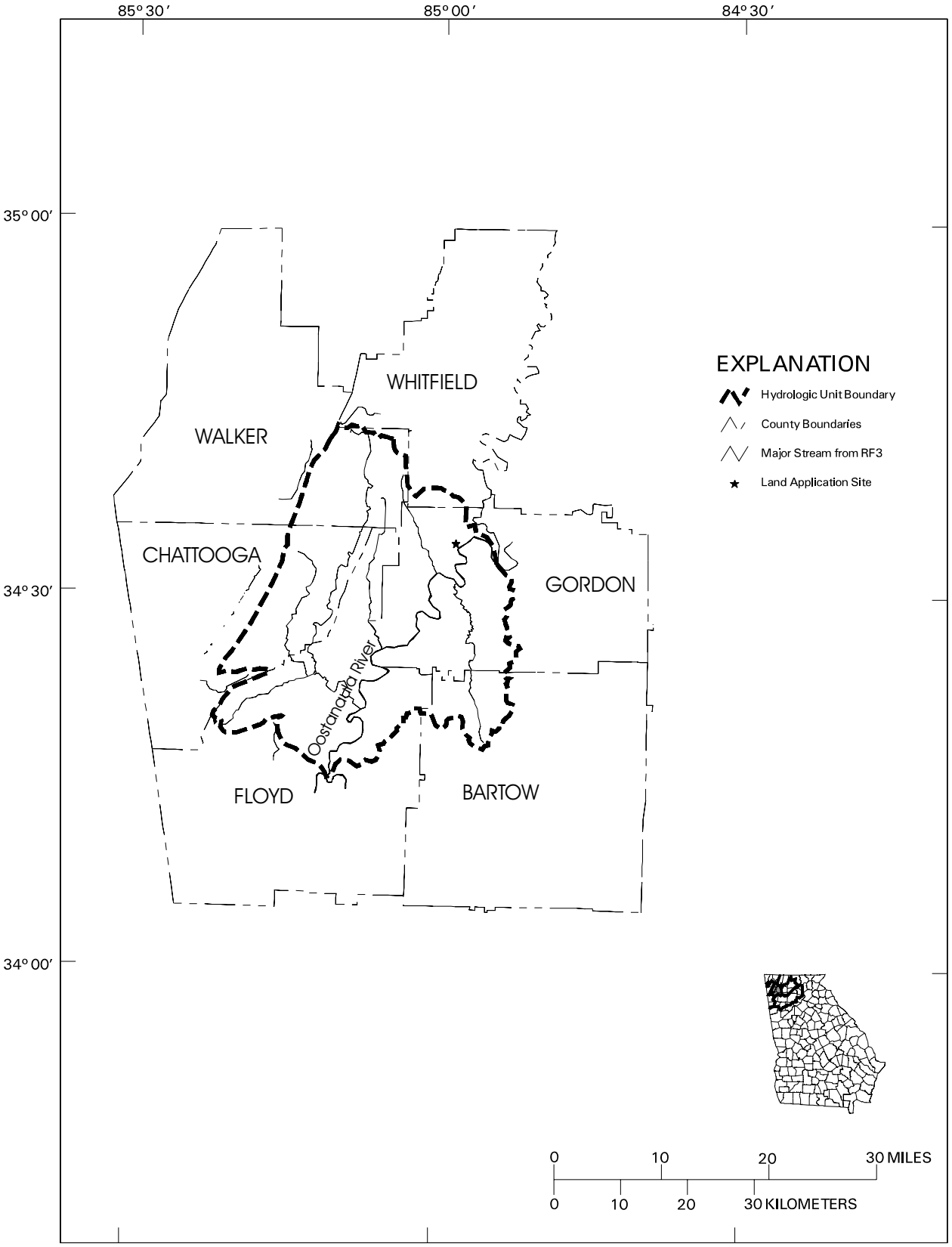

Figure 4-9. Land Application Systems, Coosa River Basin, HUC 03150103

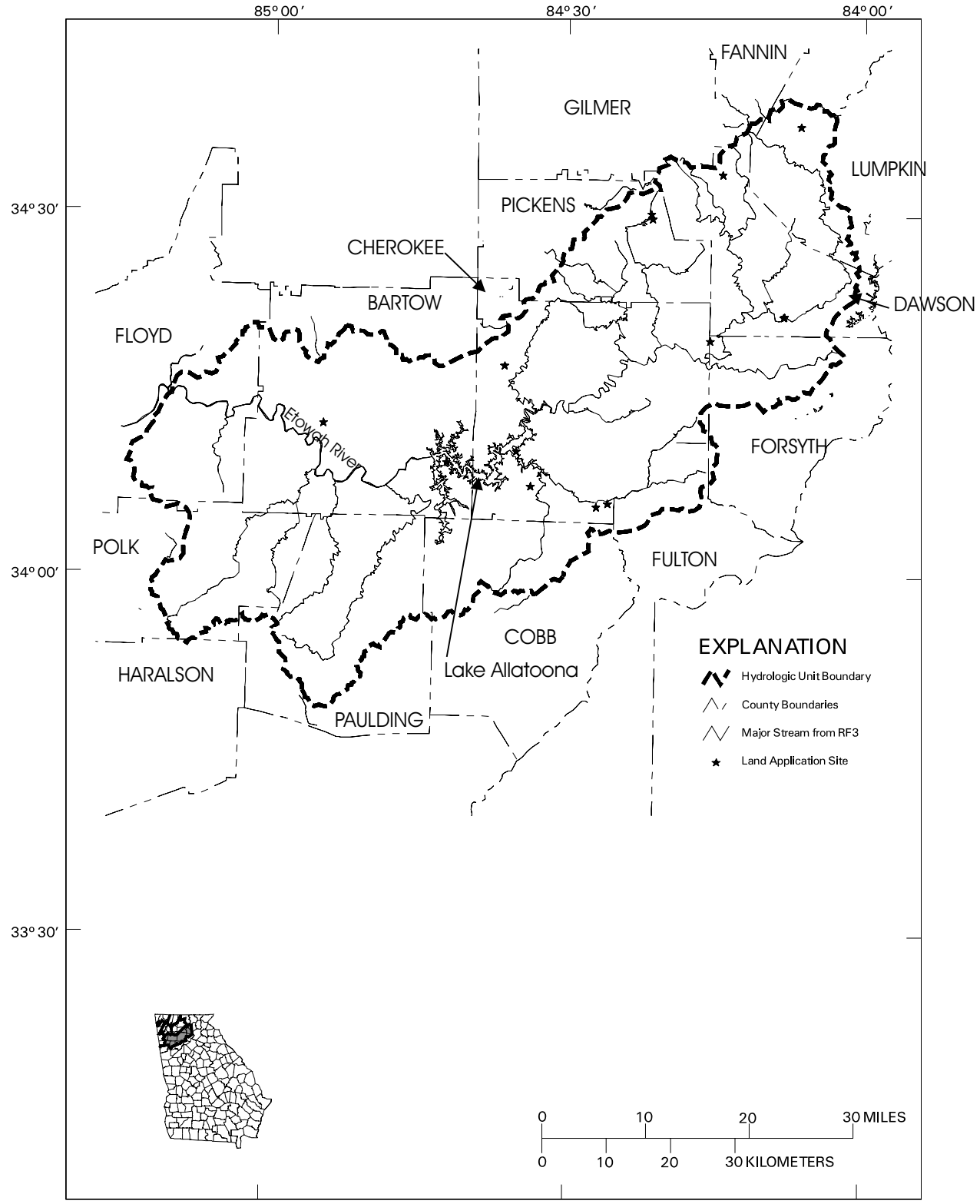

Figure 4-10. Land Application Systems, Coosa River Basin, HUC 03150104

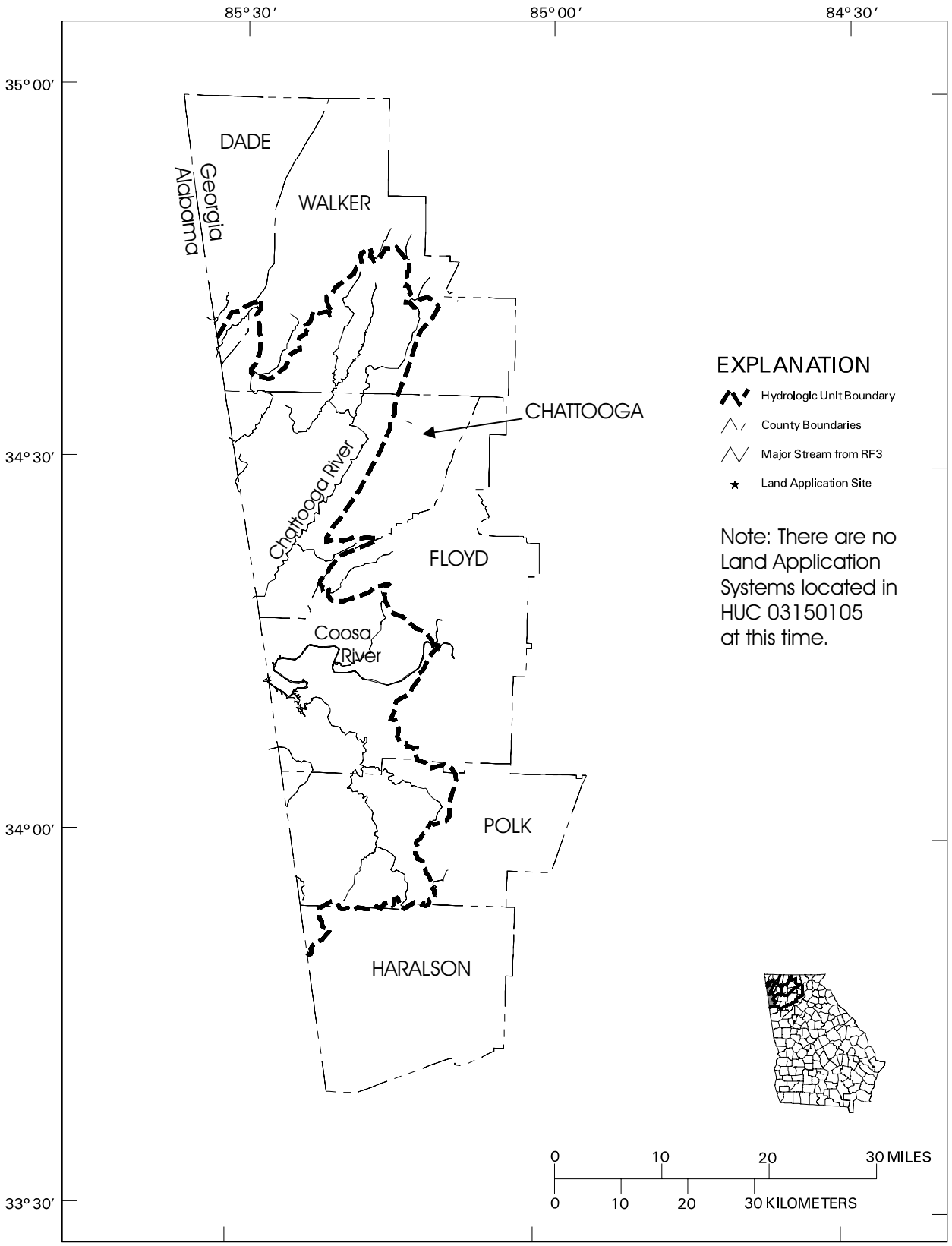

Figure 4-11. Land Application System, Coosa River Basin, HUC 03150105

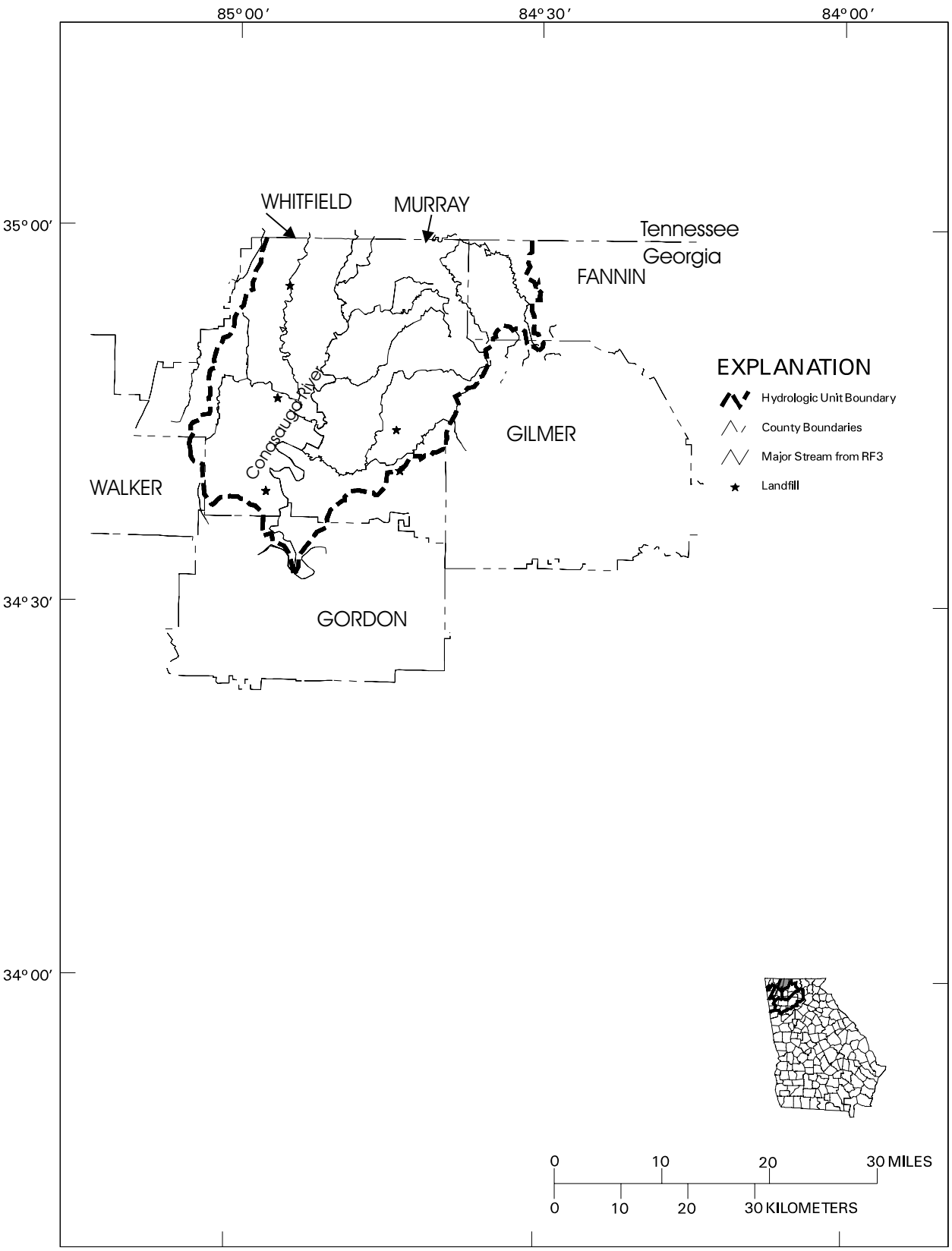

Figure 4-12. Landfills, Coosa River Basin, HUC 03150101

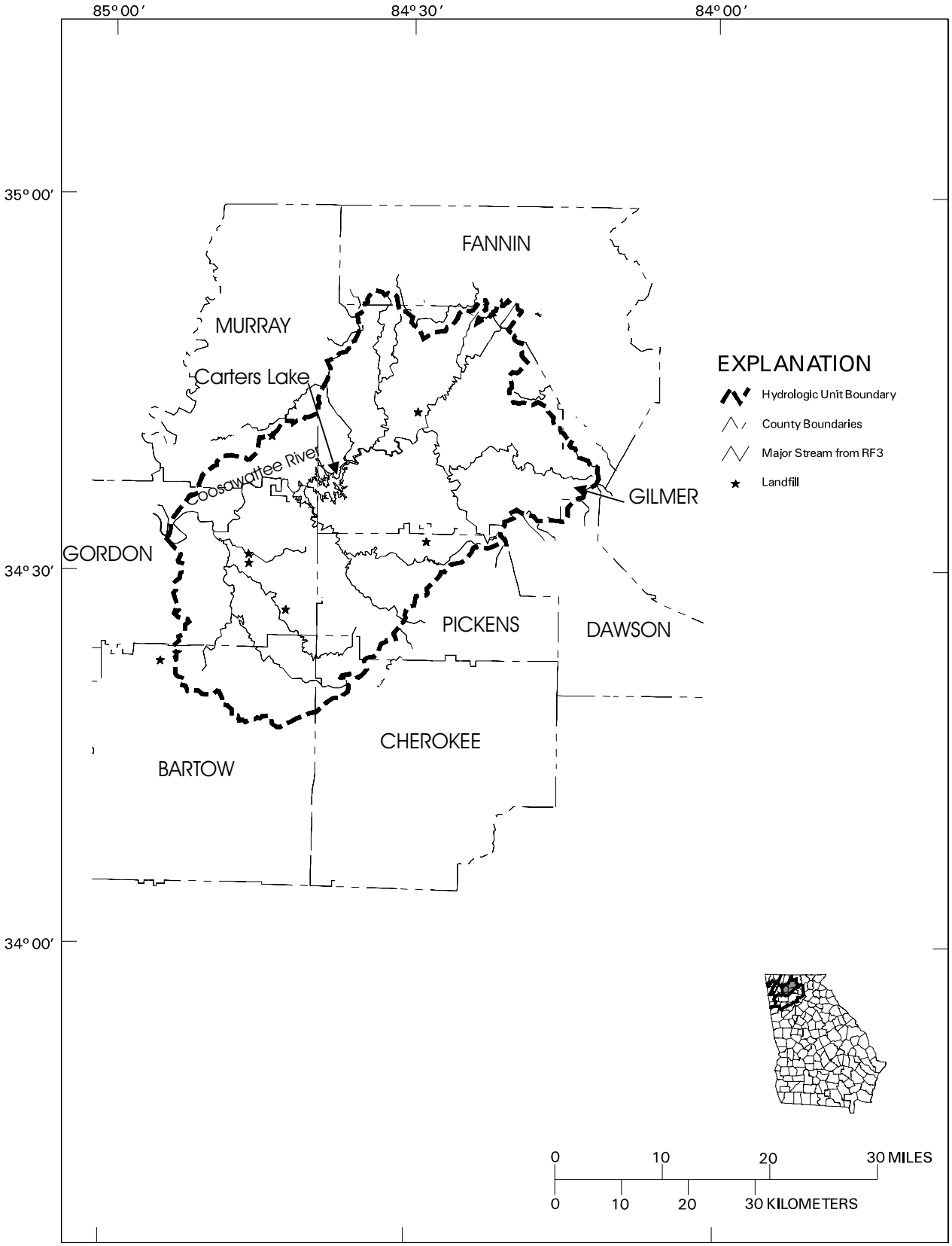

Figure 4-13. Landfills, Coosa River Basin, HUC 03150102

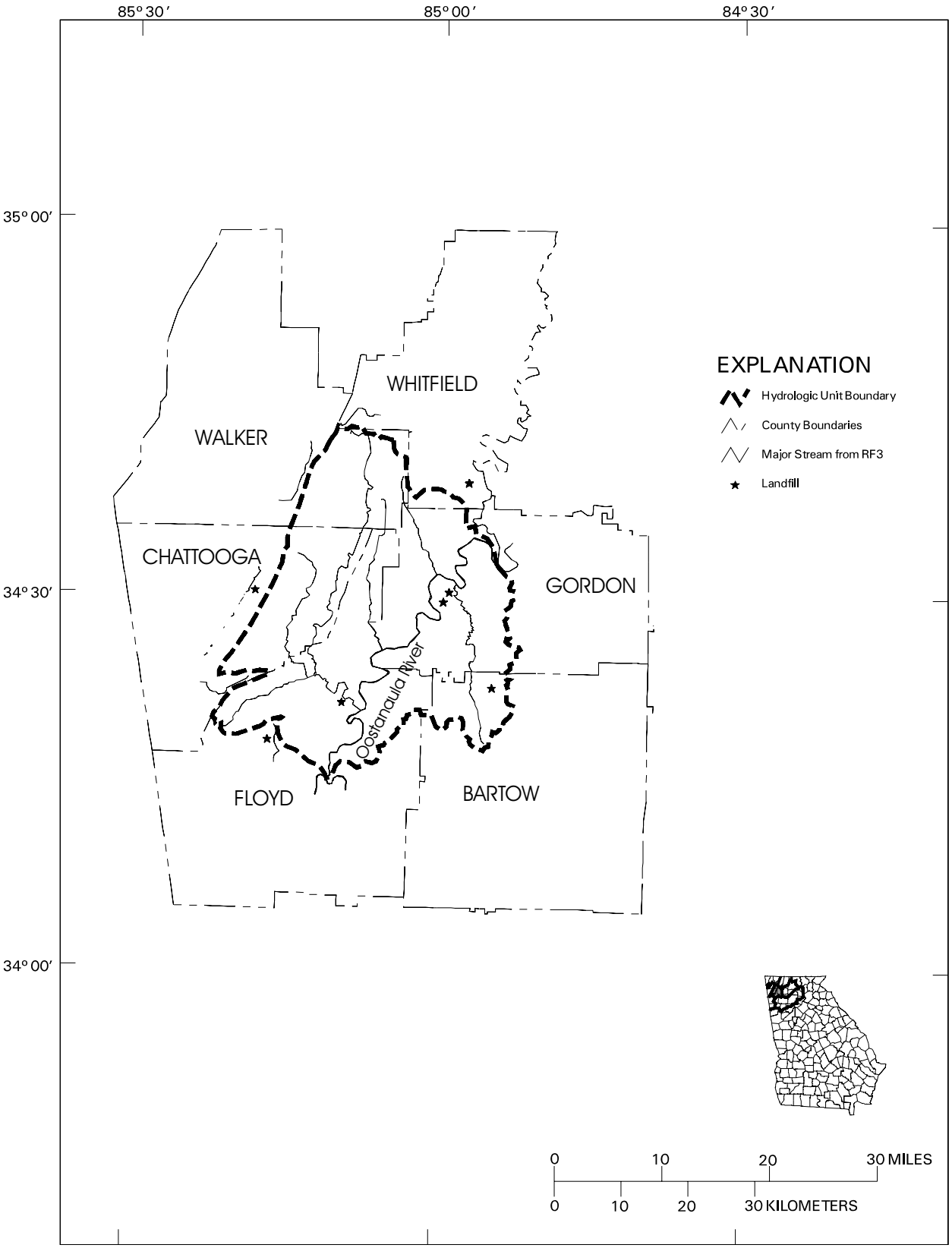

Figure 4-14. Landfills, Coosa River Basin, HUC 03150103

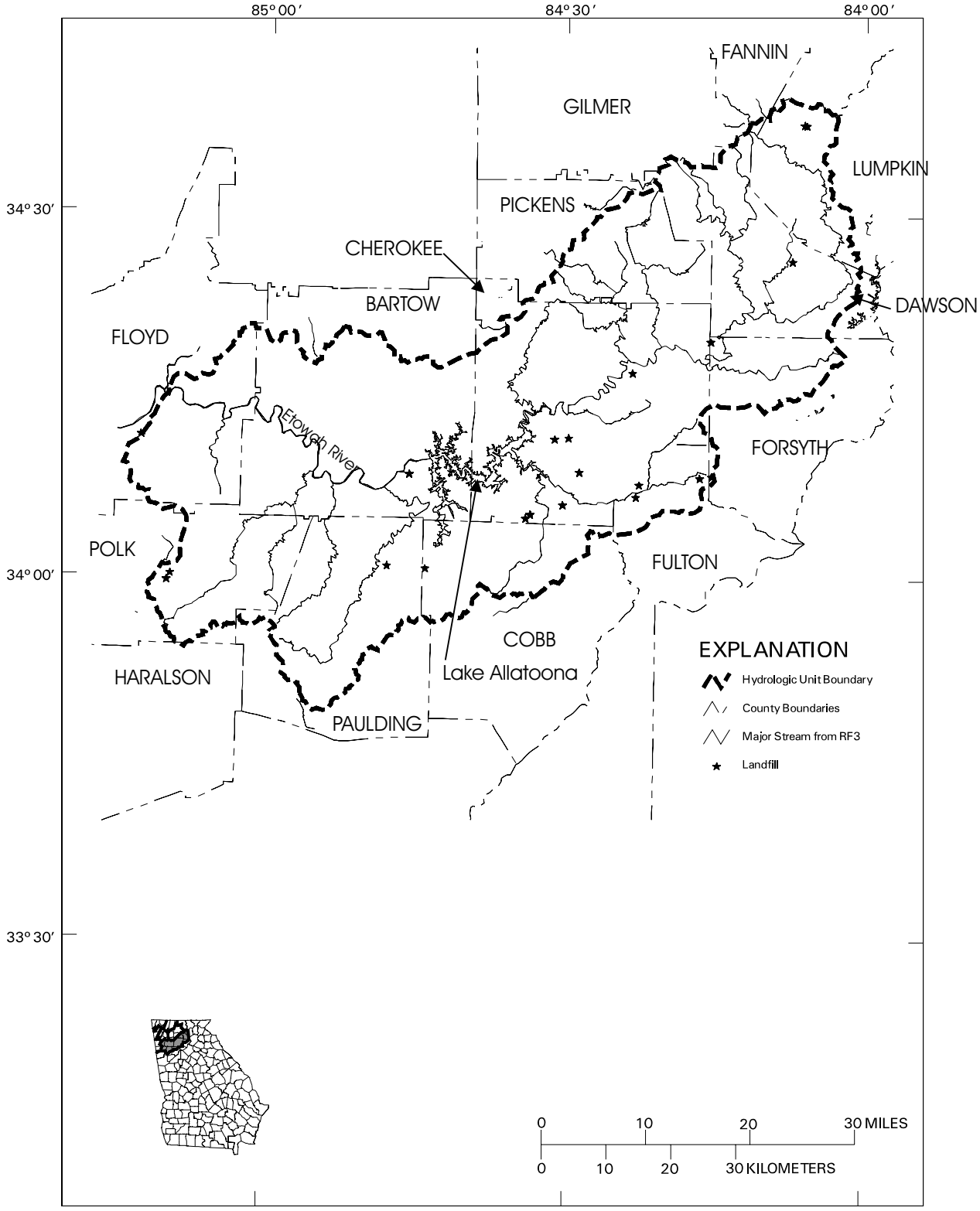

Figure 4-15. Landfills, Coosa River Basin, HUC 03150104

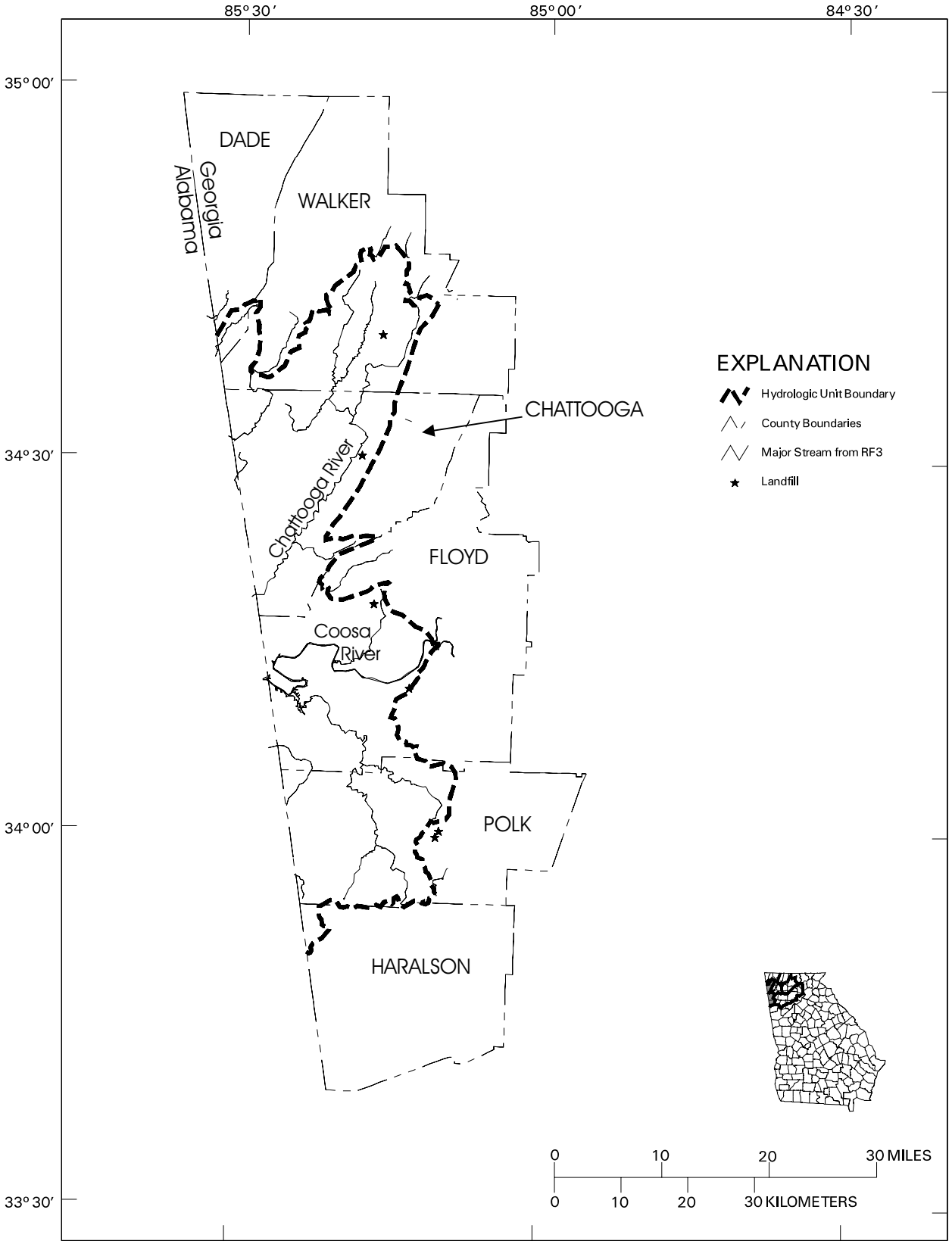

Figure 4-16. Landfills, Coosa River Basin, HUC 03150105

Table 4-6. Permitted Landfills in the Coosa River Basin

PERMIT_NO	NAME	COUNTY	TYPE
HUC 03150101 (Conasauga River Basin)			
105-004D(SL)	US 411 Dennis Mill Rd.	Murray	Sanitary Landfill
155-043D(L)	Dalton - McGaughey Ch/Coahulla	Whitfield	Landfill
155-044D(SL)	Dalton - Old Dixie Hwy PH5	Whitfield	Sanitary Landfill
155-047D(SL)	Whitfield Co. - Old Dixie Hwy.	Whitfield	Sanitary Landfill
155-034D(L)	Dalton - Waugh St. PH1	Whitfield	Landfill
155-037D(L)	Dalton - Waugh St. PH2	Whitfield	Landfill
155-021D(SL)	Dalton - Old Dixie Hwy PH2	Whitfield	Sanitary Landfill
155-027D(SL)	Dalton - Old Dixie Hwy PH4	Whitfield	Sanitary Landfill
HUC 03150102 (Coosawattee River Basin)			
061-010D(SL)	SR 52N / TV Tower PH1-5	Gilmer	Sanitary Landfill
064-009D(SL)	US 411	Gordon	Sanitary Landfill
064-010D(SL)	Lick Creek Road	Gordon	Sanitary Landfill
064-016D(SL)	Redbone Ridges Rd.	Gordon	Sanitary Landfill
105-012D(L)	US 411 Westside	Murray	Landfill
105-011D(SL)	US 411 Westside	Murray	Sanitary Landfill
112-005D(SL)	Jones Mtn Rd. PH2	Pickens	Sanitary Landfill
112-007D(SL)	Jones Mtn Rd. Westside	Pickens	Sanitary Landfill
112-006D(SL)	Jones Mtn Rd. PH3	Pickens	Sanitary Landfill
HUC 03150103 (Oostanaula River Basin)			
008-012D(SL)	SR 140 Adairsville	Bartow	Sanitary Landfill
057-011D(L)	Jones Mill Rd.	Floyd	Landfill
064-003D(L)	SR 156	Gordon	Landfill
064-011D(SL)	Harris Rd. PH2	Gordon	Sanitary Landfill
064-014D(L)	Calhoun - Harris Rd. PH4	Gordon	Landfill
HUC 03150104 (Etowah River Basin)			
008-008D(SL)	SR 394 Emerson PH1	Bartow	Sanitary Landfill
008-016D(SL)	SR 294 Emerson MSWL	Bartow	Sanitary Landfill
028-040D(L)	SWIMS - SR 92 (Dixie) PH4	Cherokee	Landfill
028-041D(SL)	Blalock Rd. PH6	Cherokee	Sanitary Landfill
028-039D(SL)	Pine Bluff Landfill Inc.	Cherokee	Sanitary Landfill
028-034D(L)	SWIMS - SR 92 (Dixie) PH3	Cherokee	Landfill
028-032D(L)	Kuykendall - Earney Rd.	Cherokee	Landfill
028-030D(L)	SWIMS - SR 92 (Dixie) PH1&2	Cherokee	Landfill
028-015D(SL)	Blalock Rd. PH3	Cherokee	Sanitary Landfill
028-017D(SL)	Blalock Rd. PH4	Cherokee	Sanitary Landfill
028-014D(SL)	Ridge Rd. PH2	Cherokee	Sanitary Landfill
028-013D(L)	Kendrick - Arnold Mill Rd. PH1	Cherokee	Landfill
028-007D(L)	Univeter Rd.	Cherokee	Landfill

PERMIT_NO	NAME	COUNTY	TYPE
028-012D(SL)	Brown - SR 92W	Cherokee	Sanitary Landfill
033-038D(SL)	Cheatham Rd. PH2	Cobb	Sanitary Landfill
042-002D(SL)	Shoal Hole Rd	Dawson	Sanitary Landfill
058-010D(SL)	Hightower Rd. PH4	Forsyth	Sanitary Landfill
058-009D(SL)	Hightower Rd. PH3	Forsyth	Sanitary Landfill
058-005D(L)	Anglin - Francis Rd.	Forsyth	Landfill
058-006D(SL)	Hightower Rd. PH1	Forsyth	Sanitary Landfill
060-072D(L)	Chadwick Road Landfill	Fulton	Landfill
060-059D(L)	Honea - C&R Landfill (Francis	Fulton	Landfill
093-005D(SL)	US Army - Camp Merrill No. 6	Lumpkin	Sanitary Landfill
093-004D(SL)	Camp Merrill - US Army	Lumpkin	Sanitary Landfill
110-005D(SL)	Gulledge Rd. N. Tract 1	Paulding	Sanitary Landfill
115-005D(SL)	US 278 Cedartown PH2	Polk	Sanitary Landfill
115-008D(SL)	Grady Rd.	Polk	Sanitary Landfill
HUC 03150105 (Coosa below Rome and Chattooga River Basin)			
027-006D(SL)	Penn Bridge Rd. PH1	Chattooga	Sanitary Landfill
057-013D(SL)	Walker Mtn Rd. PH1 2 &3	Floyd	Sanitary Landfill
057-020D(MSWL)	Walker Mtn. Rd. Site 2	Floyd	Municipal Solid Waste
057-009D(SL)	Berry Hill Rd.	Floyd	Sanitary Landfill
146-013D(L)	LaFayette - Coffman Springs Rd	Walker	Landfill

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 also 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 the 1996-1997 water quality assessment results for the Coosa 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.

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 nitrate-nitrogen, the major route of nitrate loss is to streams by interflow or to groundwater 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 4-7).

In July and August 1996, the USEPA 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 to 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 4-8.

Table 4-7. 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)
Bartow	100	104,812	128,849	41.8	442	0.15	152	0.051
Chattooga	100	37,841	54,053	48.0	156	0.15	62	0.058
Cherokee	100	30,811	49,473	30.3	403	0.25	106	0.065
Cobb	33	8,154	8,838	38.8	25	0.11	10	0.044
Dawson	91	13,373	11,948	30.6	78	0.21	23	0.061
Fannin	2	19,330	22,052	21.3	80	0.08	33	0.032
Floyd	100	58,438	61,159	34.7	227	0.14	83	0.050
Forsyth	31	36,057	27,381	26.6	330	0.33	69	0.067
Fulton	9	15,476	12,513	28.6	33	0.07	13	0.029
Gilmer	94	21,780	30,930	26.7	348	0.30	72	0.063
Gordon	100	67,068	125,184	63.9	670	0.35	193	0.101
Lumpkin	34	17,675	17,876	35.6	340	0.68	41	0.081
Murray	100	20,780	30,383	49.5	135	0.23	42	0.072
Paulding	60	42,409	9,882	8.2	58	0.05	20	0.017
Pickens	100	16,698	21,003	23.7	234	0.26	49	0.056
Polk	100	38,016	47,654	42.6	180	0.17	67	0.063
Walker	49	62,702	53,691	29.1	197	0.11	74	0.042
Whitfield	80	30,229	67,842	78.7	247	0.29	86	0.101

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.

Table 4-8. Waters Identified as Potentially Impacted by Agricultural Nonpoint Source Loading and Added to the Georgia 303(d) List

Waterbody	County	Pollutant(s) of Concern
Dykes and Hall Creeks	Bartow and Floyd	Habitat/Sediment
Euharlee Creek	Polk and Bartow	Biota
Canton Creek	Cherokee	Biota, Habitat
Long Swamp Creek	Pickens and Cherokee	Biota, Habitat
Coal Mt. Area	Dawson and Forsyth	Biota, Habitat
Oothklooga Creek	Gordon and Bartow	Biota, Habitat/Sediment
Lower Coosawattee River	Gordon, Gilmer, and Murray	Habitat
Pinelog Creek	Bartow and Gordon	Sediment
Sallacoa Creek	Pickens and Gordon	Biota, Habitat

Animal waste

In addition to contributing to nutrient loads, animal waste may also 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 including fecal bacteria that impact human health is of particular concern. In addition to 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 2,4-D, AAtrex/Atrazine, Weedmaster, Trifluralin/Trefland/Trilin, Blazer/Basagran, Gramoxone, Hoelon, Lexone/Sencor, Classic, Dual, and Lasso (alachor) (compiled from the Georgia Herbicide Use Survey Summary [Monks and Brown, 1991]). Since 1990, the use of alachlor in Georgia has decreased dramatically since peanut wholesalers no longer buy peanuts treated with alachlor.

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 in 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 56 percent of the water and sediment analyses in the Apalachicola-Chattahoochee-Flint basin. The first group included DDT and metabolites, and the second group included chlordane and related compounds (heptachlor, heptachlor epoxide), while dieldrin was also frequently detected. All of these pesticides are now banned by USEPA 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 Coosa 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 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). Nonpoint urban sources of pollution include drainage from areas with impervious surfaces, but also includes less highly developed areas with greater amounts of pervious surfaces such as lawns, 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 Coosa River basin, although estimates of loading rates by land use types have been widely applied in other areas. Peters and Kandell (1997) present a water quality index for streams in the Atlanta region, based primarily on nutrients and nutrient-related parameters. Data for metals, organics, biological conditions, and suspended sediment were generally unavailable. 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, while 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, or 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 in the summer for postemergent control. 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 LUSTs.

Nonpoint Sources from Forestry

Forest is the dominant land cover in the Coosa basin, accounting for 70 percent of the land area in 1991. Undisturbed forest land generally presents very low stressor loadings compared to other land uses, while the conversion of forest to urban/residential land uses is often associated with water quality degradation. For the period from 1982 through 1989, the area classified as commercial forest land within the Coosa basin decreased by approximately 106,986 acres.

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 directly related to either poorly located or poorly constructed roads. The potential impact to water quality from erosion and sedimentation is increased if BMPs are not adhered to.

Statewide BMP Implementation Survey

In 1992 the Georgia Forestry Commission (GFC) conducted a statewide BMP implementation survey to determine to what extent forestry BMPs were being implemented. Within the entire Coosa basin, the GFC evaluated 25 sites. Thirteen sites totaling 600 acres were located on private lands and 12 sites totaling 1,818 acres were located on forest industry land. Overall compliance with BMPs on both private and public lands was 95 percent.

The majority of the main haul roads on the 25 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 were needed but were not installed. Main haul roads crossed streams on almost half of the sites and culverts were sized correctly for the watershed. Almost half of the crossings were located at too steep of grades and were not stabilized correctly. By ownership, road compliance for private lands and forest industry was 66 percent and 89 percent, respectively.

The majority of the 2,418 harvested acres evaluated on the 25 sites were in compliance with BMPs. Problems were noted where water bars were not installed in skid trails with sites on sloping terrain. Only 22 percent of the log decks were stabilized. Equipment was improperly serviced on 12 percent of the sites. Harvesting within the 80-ft Streamside Management Zones (SMZs) only occurred on 17 sites and resulted in 18 percent of the zones rutted or damaged and excess logging debris left in the streams on 53 percent of the sites. Log decks were usually properly located outside of the recommended zone. Temporary stream crossings occurred on a few sites and were properly removed after the harvest on half of the sites. By ownership, harvesting compliance for private lands and forest industry was 96 percent for both.

The majority of the 417 site-prepared acres evaluated on the five sites were in compliance with BMPs. One site (50 acres) occurred on private land and 4 sites (367 acres) occurred on industry land. The main problem with noncompliance involved heavy mechanical clearing on slopes greater than 20 percent on one site and presuppression firebreaks located inside SMZs on 4 of the sites. By ownership, site preparation compliance for private lands and forest industry was 74 percent and 89 percent, respectively.

One tract was evaluated for regeneration involving 50 acres of which all 50 were in compliance with BMPs. The tract was hand planted and occurred on private land.

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, 2,4D, 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 practiced except in forest tree nurseries which is a very minor land use. Insects in pine stands are controlled by chlorpyrifos, diazinon, malathion, acephate, carbaryl, lindane, and dimethoate. Diseases are controlled using chlorothalonil, dichloropropene, and mancozeb. There is one commercial forest tree nursery within the basin and is located in Murray County.

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.I.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.

Flow Modification

Low flows in streams during drought periods form an important constraint on aquatic habitat. Expected minimum flows vary with geology. One index of low flow conditions is the low flow of seven days' duration which recurs, on average, once every two years (7Q2 flow). The 7Q2 flow in tributaries in the Coosa basin draining terrains underlain by igneous and metamorphic rocks range from about 0.4 to 0.8 cubic foot per second per square mile of drainage area. The 7Q2 flows for tributaries draining carbonate rocks is about 0.2 to 0.4 cubic foot per second per square mile, while the 7Q2 for tributaries that drain sandstone and shale may be as low as 0.005 to 0.02 cubic foot per second per square mile (Robinson et al., 1996). Reductions in these low flows as a result of man's activities can seriously stress aquatic organisms.

Natural flows in the Georgia portion of the Coosa basin have been altered by the construction of two major dams in Georgia and by Lake Weiss in Alabama. The lower Etowah river has been fully regulated since the completion of Allatoona Dam in 1949 by the U.S. Army Corps of Engineers. Carters Dam, also a Corps of Engineers impoundment, has regulated flows on the Coosawattee River since 1972. Lake Weiss backs water up the Coosa River to the vicinity of Rome, Georgia. The Mayo navigational lock and dam at Rome, although no longer functional, causes limited constriction of natural river flow just below the confluence of the Oostanaula and Etowah rivers.

Flows from Allatoona Dam are primarily driven by hydropower generation schedules for supply of electricity during peak demand times. When not generating, no minimum flow is provided. Thompson/Wyman Dam, a small privately-operated run-of-the-river hydropower dam about three miles downstream, provides limited re-regulation of flows from Allatoona and thereby lessens the impact of the pulse of high water associated with peak power generation.

The cycle of dam releases follows a weekly schedule with five weekdays of short periods of power generation followed by two weekend days of reduced generation. During a typical week, power is generated for several hours each weekday and less frequently on weekends. Superimposed on these daily and weekly cycles is an annual pattern caused by operations for flood control. During the fall, the reservoir pool in Allatoona is lowered to provide flood storage for winter and spring rainfall runoff. During very high inflows, water may pass over the concrete spillway at Allatoona Dam.

Flows from Carters Dam are also driven by hydropower generation schedules for supply of electricity during peak demand times, but Carters is a pumped storage facility with a lower storage pool that not only allows water to be pumped back into Carters Lake during low electricity demand periods, but also allows for re-regulating the river flow. Water is released from the re-regulation pool at a relatively constant rate that depends on net daily flow from Carters Dam, thus the river downstream has a relatively natural flow regime (except for extreme high flows). Carters Dam also provides for flood control by lowering the normal pool elevation in anticipation of increased winter and spring rainfall.

Temperature

The Coosa Basin has many miles of trout waters that are threatened by the impact of small impoundments which can result in increased summer temperatures. Most 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.

Another threat to suitable temperature regime in the trout streams of the Coosa River basin is the removal of riparian tree cover, which allows increased warming of water by sunlight. Under natural conditions, smaller streams in Georgia are shaded by a tree canopy. If this canopy is removed the resulting direct sunlight can result in increased water temperatures with adverse effects on native aquatic life. Timber harvest within riparian buffers can thus lead to temperature stress if proper management practices are not followed. Increases in impervious surface area coverage (particularly paved areas) in the watershed also contribute to stream warming.

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 alteration of 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 Coosa 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 are 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 overabundance 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 in the Coosa basin 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 freshwater 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 Coosa basin are agricultural runoff, urban runoff, storm water, and wastewater treatment facilities. Concentrations found within rivers and lakes of the Coosa 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 Coosa River basin can be obtained by examining results from EPD long-term trend monitoring stations.

Trends in loading of total phosphorus can be seen by examining the monitoring summary shown in Table 4-9. Total phosphorus concentrations have remained relatively low on average in the Coosawattee and Etowah River stations. The highest average concentrations have been seen in the Conasauga River, in the Chattooga, and in the Coosa at the Alabama State Line.

Table 4-9. Trend Monitoring Summary for Total Phosphorus (mg/L) in the Coosa River Basin

Station	Years	Average	Maximum	Minimum
Conasauga nr. Resaca, 14040001	1973-1996	0.66	7.2	0.02
Coosawattee at Hwy 225, 14130001	1974-1996	0.05	0.53	0.02
Oostanaula at Rome intake, 14250001	1973-1998	0.24	1.1	0.02
Etowah at Hwy. 5, 14300001	1968-1996	0.06	0.59	0.02
Etowah at Rome, 14350001	1968-1996	0.08	1.1	0.02
Coosa at Alabama Line, 14450001	1973-1998	0.17	0.6	0.02
Chattooga near Chattoogaville, 14560001	1973-1998	0.28	0.92	0.04

Figure 4-17 shows trends in phosphorus concentrations in the Coosa River at the Alabama line. Declines in concentration in the mid-1970s appear to reflect upgrades to the Rome WPCP. Concentrations increased throughout the 1980s. A strong decline in average concentration after 1989 reflects further WPCP upgrades and legislation restricting the use of phosphate detergents.

Figure 4-18 shows phosphorus concentration trends in the upper Etowah River. This station is above Lake Allatoona, and nutrient loads and associated eutrophication of Lake

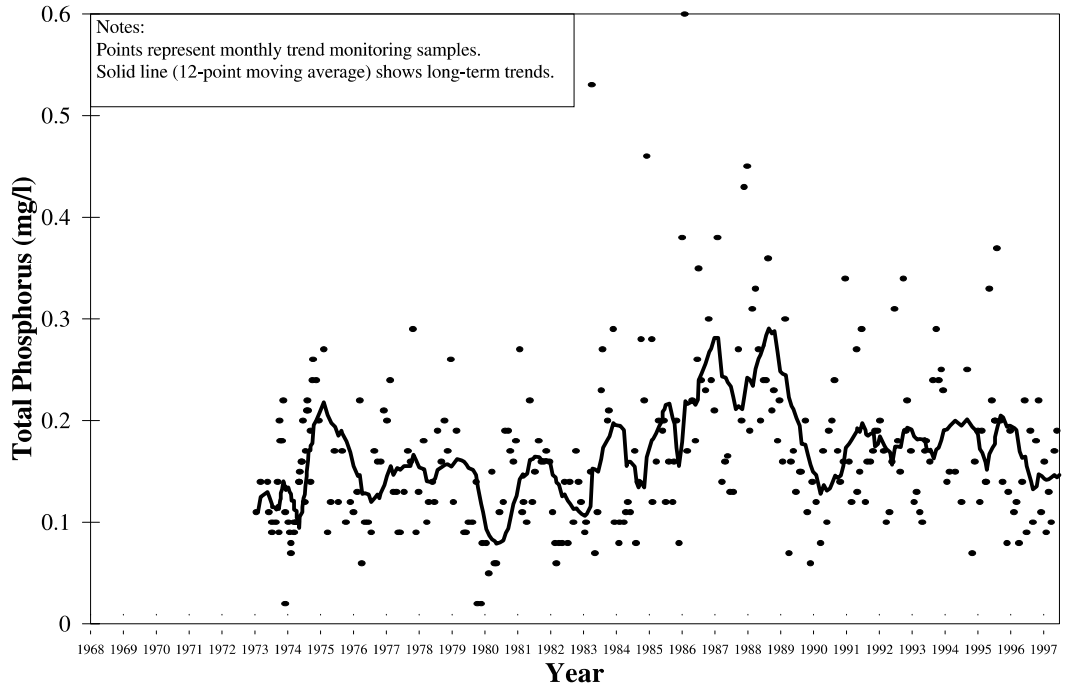

Figure 4-I7. Phosphorus Concentrations, Coosa River at Alabama State Line (Trend Monitoring Station I4450001)

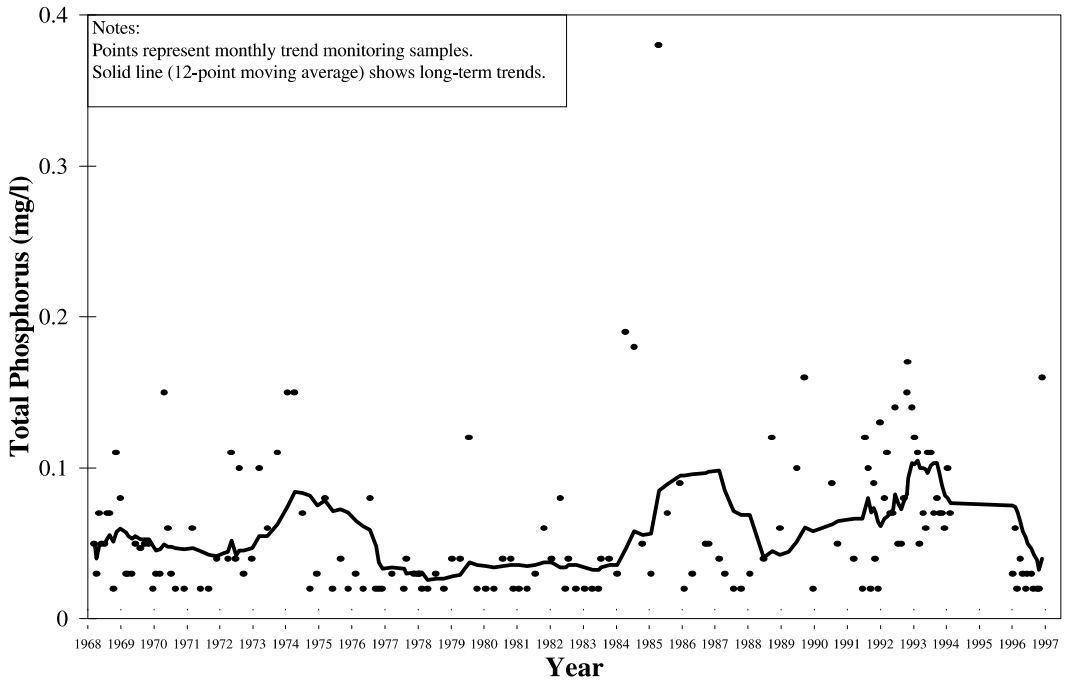

Figure 4-I8. Phosphorus Concentrations, Etowah River at Georgia Highway 5 (Trend Monitoring Station I4300001)

Allatoona remain a concern in the basin. Concentrations at this station have generally increased into the 1990s, although the most recent 1996 observations showed lower levels.

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 Coosa basin are associated with oxygen-demanding wastes from point and nonpoint sources and hydropower operations which release oxygen-depleted bottom water from reservoirs. Historically, the greatest threat to maintaining adequate oxygen levels to support aquatic life has come from the discharge of oxygen-demanding wastes from wastewater treatment plants. Treatment upgrades and more stringent permit limits have reduced this threat substantially.

Within the Coosa basin, most dissolved oxygen measurements have remained above the minimum concentration of 4.0 mg/L specified in water quality standards (see Table 4-10). Low concentrations in the Chattooga River were observed in the first year of monitoring in 1973, but since have remained above 4.0 mg/L. More significant dissolved oxygen problems were historically present in the Conasauga River downstream of Dalton. Figure 4-19 shows the long-term trends in dissolved oxygen concentrations in the Conasauga at Resaca. In the early years there were frequent observations of concentrations less than 4.0 mg/L; however, there has been a general upward trend in concentrations, and no concentrations below 4.0 mg/L have been observed in trend monitoring since 1987.

Table 4-I0. Trend Monitoring Summary for Dissolved Oxygen (mg/L) in the Coosa River Basin

Station	Years	Average	Maximum	Minimum
Conasauga nr. Resaca, 14040001	1973-1996	7.5	13.6	0.1
Coosawattee at Hwy 225, 14130001	1974-1996	9.1	13.8	5.3
Oostanaula at Rome intake, 14250001	1973-1998	8.2	12.5	4.0
Etowah at Hwy. 5, 14300001	1968-1996	9.2	14.0	5.6
Etowah at Rome, 14350001	1968-1996	8.9	14.0	5.0
Coosa at Alabama Line, 14450001	1973-1998	7.8	12.7	3.8
Chattooga near Chattoogaville, 14560001	1973-1998	8.2	13.5	2.5

4.2.3 Metals

Violations of water quality standards for metals (e.g., lead, copper, zinc) were the second most commonly listed causes of non-support of designated uses in the 1996-97 water quality assessment of the Coosa 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 Coosa 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 with quality of some of the older data. While urban runoff appears to be the primary source of loading of these stressors, loading rates have not been quantified and will require additional study.

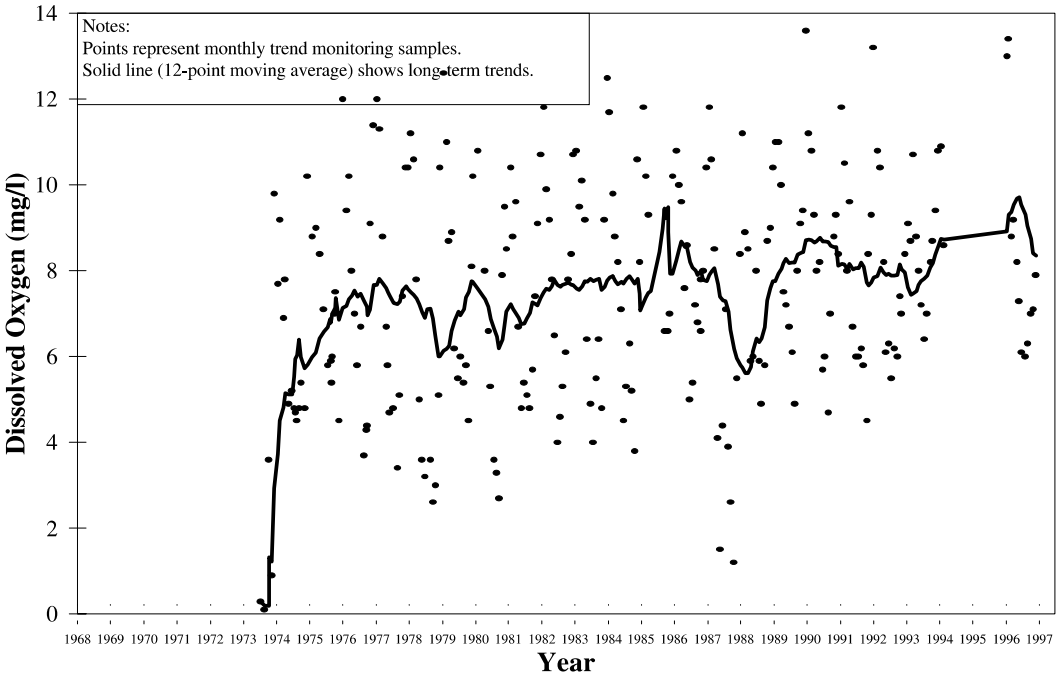

Figure 4-I9. Dissolved Oxygen Concentrations in the Conasauga River near Resaca, Georgia (Trend Monitoring Station I4040001)

4.2.4 Fecal Coliform Bacteria

Violations of the standard for fecal coliform bacteria were the most commonly listed cause of non-support of designated uses in the 1996-97 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 Coosa River have generally been rapidly corrected in recent years. Combined sewer overflows, which may discharge dilute untreated sewage directly to streams during wet weather, have been a source of intermittent fecal coliform contamination in the Rome and Cedartown areas, but are now being addressed through control strategies, as discussed in Section 4.1.1.2.

Table 4-11 summarizes long term trend monitoring data for fecal coliform bacteria in the Coosa River basin. State water quality standards for the fishing classification specify a 30-day geometric mean of 200 MPN/100 ml for May through October, and 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.

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

Station	Years	Geometric Mean	Average	Maximum	Median
Conasauga nr. Resaca 14040001	1973-1996	671	4706	43000	750
Coosawattee at Hwy 225 14130001	1974-1996	234	773	23000	210
Oostanaula at Rome intake 14250001	1973-1998	538	1937	43000	330
Etowah at Hwy. 5 14300001	1968-1996	402	2577	33000	330
Etowah at Rome 14350001	1968-1996	629	10653	930000	330
Coosa at Alabama Line 14450001	1973-1998	339	3729	290000	210
Chattooga near Chattoogaville 14560001	1973-1998	380	2074	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 4-11 are generally inflated by data from earlier years prior to WPCP upgrades. For instance, monitoring in the Etowah River at Rome (Figure 4-20) shows a steady declining trend in fecal coliform concentrations from the late 1960s to the present (note the use of a logarithmic scale). Monitoring at this station from 1990 to 1996 shows that the median winter concentration was 168 and the median summer concentration 340 MPN/100 ml, indicating the need for continued improvements.

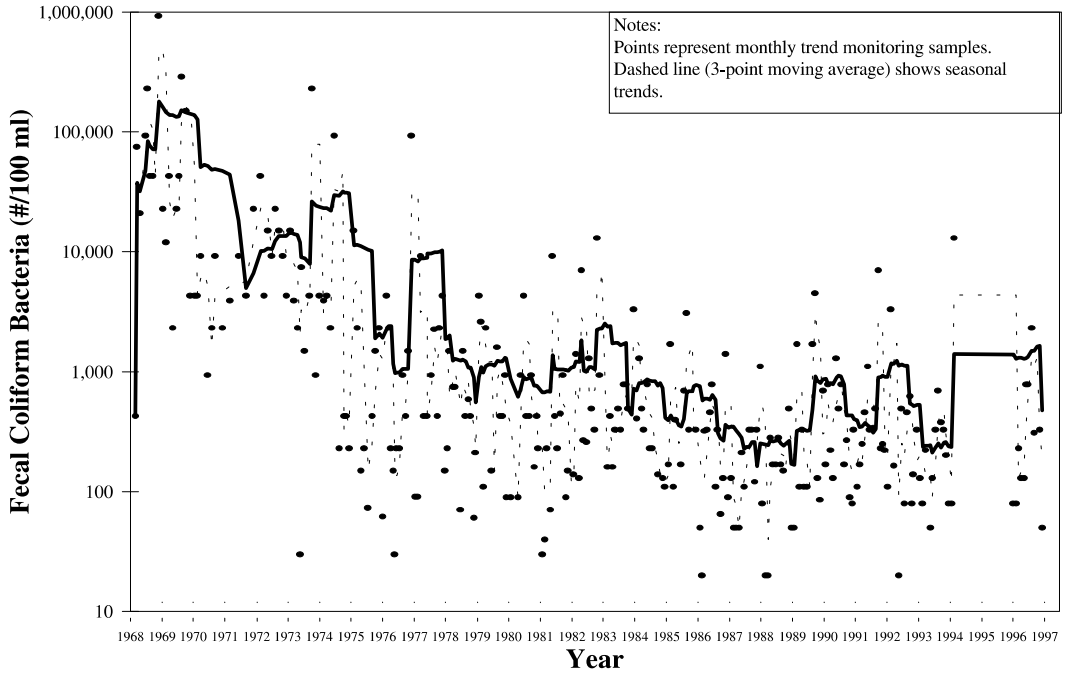

Figure 4-20. Fecal Coliform Bacteria Concentrations (MPN/100 ml), Etowah River near Rome (Trend Monitoring Station 1435000I)

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 the following:

- Agricultural nonpoint sources, including concentrated animal operations and spreading and/or disposal of animal wastes may introduce fecal contamination into waterbodies.
- Runoff from urban areas that transport 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, insecticides, etc.;
- Nonpoint runoff from agricultural and silvicultural land with pesticide and herbicide applications;
- Nonpoint runoff from urban areas, which may load a variety of SOCs, including horticultural chemicals, termiticides, etc.;
- Illegal disposal and dumping of wastes.

To date, synthetic organic chemicals have not been detected in the surface waters of the Coosa River basin in problem concentrations, except for chlordane in the Chattooga River. It should be noted, however, that the majority of monitoring has been targeted to waters located below point sources where potential problems were suspected. Agricultural sources were potentially important in the past, particularly from cotton production in the Coastal Plain, but the risk has apparently greatly declined with a switch to less persistent pesticides. Recent research by USGS (Stell *et al*., 1995; Hippe *et al*., 1994) suggests pesticide/herbicide loading in urban runoff and storm water may be of greater concern than agricultural loading, particularly in streams of the metropolitan Atlanta area.

Certain SOCs, discharged to the watershed in past decades, continue to be of concern today. In particular, PCBs (now banned) have resulted in fish consumption guidelines in the lower Oostanaula, lower Etowah, and Coosa River mainstem below the GE Rome plant. These compounds, which are highly bioaccumulative, apparently enter the food chain from residuals in contaminated river sediments.

4.2.6 Stressors from Flow and Temperature Modification

Stress from flow modification is primarily associated with the peaking hydropower operation of Allatoona Dam on the Etowah River, and to some extent, increased storm flow in smaller streams in developing areas as the percentage of impervious surfaces increases. During drought periods, the flow of the Conasauga River below the city of Dalton has been severely depleted due to municipal/industrial withdrawals, and the potential exists for such flow depletion below other withdrawals in the basin. The

hydropeaking operation of Allatoona Dam results in pulsing of flow and seasonal depletion of dissolved oxygen during summer and fall. Oxygen levels are largely restored to normal as the river flows over the crest of Thompson-Wyman Dam, a low-head dam about three miles downstream from Allatoona.

The Etowah River below Lake Allatoona is artificially cooled by releases of water from deep in the lake. Although not cold enough to support a trout fishery, the cool water is beneficial to striped bass which reproduce naturally within the Coosa Basin.

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 may 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, areas where cultivated cropland exceeds 20 percent of the total land cover, and areas where foresters are not following appropriate management practices.

4.2.8 Habitat Degradation and Loss

In many parts of the Coosa 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 is 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 Coosa River basin, in terms of both water quantity (Section 5.1) and water quality (Section 5.2) issues. The assessment results are then 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 Coosa 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 Coosa 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) demands from the Coosa River basin are expected to increase by about 50 percent between 1995 and 2020, virtually all from surface water sources. By the year 2050, M&I water use is expected to increase another 40 percent (which includes Cobb County withdrawals).

Drinking Water Quality: Surface Water

Overall, the surface water quality in the Coosa River basin is good for use as drinking water. All public water systems in the state of Georgia that use surface water meet 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 Coosa 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. Many water plants have reservoirs to store large amounts of water and to settle out excess

sediment (turbidity). In some cases, taste and odor problems are associated with algae blooms in these reservoirs, or with elevated concentrations or iron and manganese which can arise when an anoxic, reducing environment exists in the bottom water of reservoirs. Table 5-1 summarizes the known and potential raw water quality problems affecting drinking water supplies associated with surface water intakes within the Coosa basin.

Drinking Water Quality: Ground Water

Overall ground water quality from wells are very good for use as drinking water from wells. 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. However, in the Coosa basin a few public water system wells have been contaminated by local pollution sources such as leaking underground storage tanks, malfunctioning septic tanks, spills, and possibly agricultural activities. 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. Also, a few springs in the basin have been found to be under the direct influence of surface water due to the geology of the area in which they are located. These springs are monitored and have additional treatment requirements.

5.1.2 Agriculture

The water demand for agricultural use in the Coosa 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

In the Coosa basin the availability of water is most likely to have a significant effect on recreation through the way in which water levels are managed at Lake Allatoona and, to a lesser degree, Carters Lake. Because of the significant recreational use of Lake Allatoona, and the tremendous investment in homes and recreation activities around the Lake, it is important that water levels be kept as high as possible, especially in the spring, summer, and early fall. However, water level management is as much a function of the way in which the reservoirs are operated as of water availability. Should the operation of the dam emphasize power production and a conservative flood control philosophy, water levels will not be kept as high as would be the case if storage were to be maximized as a precaution against a drought. Under the current Corps of Engineers' operational philosophy, when a drought occurs there will likely be a greater chance that water levels will drop below the levels that are optimum for recreation. There are also issues related to flood protection which must be considered carefully before normal pool levels are raised. The ACT/ACF Study should address this issue as well as that of water flow allocation in the basins.

5.1.4 Hydropower

Hydropower production to meet power generation needs is dependent on timely release of water through the turbines in the major reservoirs. The continued release of sufficient quantities of water to meet the peaking demand during droughts will be dependent on the water allocation decisions made by the ACF Interstate Compact Commission, and also by decisions made within Georgia about in-state allocation of the available water supply. Given the priority for meeting drinking and agricultural water needs within Georgia, it is certainly possible that hydropower production could be curtailed at times when water availability is low.

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

Conasauga River Basin (HUC 03150101)

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
Dalton Utilities - 3130000	Conasauga River (intake at plant)	1	Water System Name Y	2	Intake can pump to Parrott Plant reservoir or directly to plant. Drainage area above intake primarily agricultural with row crops and hayfields. River has experienced drought problems before. Some problems associated with rapid increases in turbidity also exist.	Both plants in compliance. Overall good operation. County officials need to identify sources of erosion and sedimentation and take steps to implement BMP to prevent further degrade of water.
City of Chatsworth - 2130000	Mill Creek	1			Intake pumps to Mill Plant. Mill Creek shallow and known for drought problems. Haig Mill Reservoir upstream to regulate flow but introduces taste and odor problems. Potential pollution concerns upstream from development and transportation corridors.	
	Conasauga River	1			New intake upstream from other Conasauga intake.	
	Coahulla Creek	1			Secondary source intake that feeds to Parott Plant reservoir. Shallow source with taste, odor and problems attributed to rapid increases in turbidity.	
	Holly Creek	1	N	1	Inactive intake but my come back on line after improvements to plant. Historically shallow source impacted by drought and problems attributed to rapid increases in turbidity.	Plant off line and needs improvements.

HUC 03150102-Coosawattee River Basin

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
City of Chatsworth - 2130000	Carter's Lake - Eton Spring	1	Y	1	Overall no major water quality problems. Some taste and odor problems but very little development up stream. Potential pollution concerns from recreational boating.	Package Plant Water system in compliance.
USCE Resource Managers Office - 2130005	Carter's Lake	1	Y	1	Overall no major water quality problems. Some taste and odor problems but very little development up stream. Potential pollution concerns from recreational boating.	Package plant water system in poor condition. Anticipated to be abandoned. Non-community public water system.
City of Calhoun - 1290000	Coosawattee River	1	N	1	Some problems attributed to rapid turbidity changes due to agricultural row crop lands upstream. Occasionally intake clogs with leaves.	Water system in compliance. Overall good operation.

HUC 03150103-Oostanuala River Basin

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
City of Calhoun - 1290000	Oostanaula River	1	N	1	City suspended use intake due to industrial color and foaming discharges upstream.	Intake when active pumps to plant located in HUC 03150102.
Galey Lord - Brighton Plant - 1150005	Woodward Creek	1	N	1	Some drought problems due to shallow source. Occasional problems possibly caused by upstream industrial activities. Potential pollution concerns from transportation corridors.	Package Plant Water system in compliance. Overall good operation. Non-community public water system.
Berry College - 1150003	Possum Trot Lake	1	N	1	Protected watershed.	Water system in compliance. Overall good operation.

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
City of Rome Water Department - 1150002	Etowah River	1	N	1	Secondary intake. Some problems attributed to rapid turbidity changes.	Water system in compliance. Overall good operation. County and state officials need to identify sources of industrial color and foaming and take steps to implement BMPs to prevent further degradation of water.
	Oostanaula River	1			Primary intake subject to problems attributed to rapid turbidity changes. Intake also impacted by industrial color and foaming discharges upstream. Potential pollution concerns from transportation corridors.	

HUC 03150104-Etowah River Basin

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
USA Camp Frank Merrill - 1870006	Etowah River	2	N	2	Overall no known water quality problems. Pristine trout stream.	New Package Plant Water system in compliance. Old plant is now emergency source. Non-community public water system.
Grandview Salvation Army - 2270008	Lake Grandview	1	Y	1	Overall no major water quality problems. Protected watershed has established residential area and forested area. Some taste and odor problems due to iron and manganese and algae. Clogging of intake due to leaves.	Water system in compliance. Overall good operation. Non-community public water system.

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
Bent Tree Community - 2270003	Lake Tamarack	1	N	1	Overall no known water quality problems but due to development upstream silting of intakes now occurring. Problem developed over 1997.	Package plant water system overall in compliance but has staffing violations. Non-community public water system. Home owners and developer need to request assistance from county to work with upstream developers to implement erosion and sedimentation BMPs.
City of Etowah - 0850000	Etowah River	1	Y	1	New public water system that went online in 1997. No know water quality problems yet. Potential Pollution concerns from transportation corridors upstream of intake and pasture land in drainage areas.	Water system in compliance. Overall good operation.
City of Jasper - 2270000	Long Swamp Creek	1	Y	1	Overall no major water quality problems. Some taste and odor problems due to algae being discharged with Lake Grandview upstream. Shallow source is prone to rapid turbidity changes and some silting of intake. Potential pollution concerns upstream with an old mining operation.	Water system in compliance. Overall good operation.
Cherokee County Water and Sewer Authority - 0570002	Etowah River	1	Y	1	Some problems attributed to rapid turbidity changes especially after hard rain. Occasionally have to shut down pumps if raw water turbidity too high. Potential development upstream.	Water system in compliance. Overall good operation. County officials need to identify sources of erosion and sedimentation and take steps to implement BMP to prevent further degradation of water.

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
City of Canton - 0570001	Etowah River	1	N	1	Problems with a poultry rendering and processing plants upstream of intake with poultry parts washing into River. Commercial development including new outlet mall on Hwy 5 has increased problems attributed to rapid turbidity changes and higher turbidity. Potential pollution concerns upstream with an old, private owned landfill.	Water system in compliance. Overall good operation. City needs to work with poultry representatives, County and State officials to prevent poultry parts from washing into river. County officials need to identify sources of erosion and sedimentation and take steps to implement BMP to prevent further degradation of water.
City of Cartersville - 0150002	Lake Allatoona	1	Y	1	Overall no major water quality problems. Some potential pollution concerns from transportation corridors (I-575 and I-75), recreation on the lake and algae.	Water system in compliance. Overall good operation.
Cobb Co./Marietta Water Authority - 0670002	Lake Allatoona	1	Y	1	?	
City of Rockmart Water Authority - 2330002	Euharlee Creek	1	N	1	Overall no major water quality problems. Some urban runoff that has caused problems attributed to rapid turbidity changes. Some potential pollution concerns from transportation corridors (US 278).	Water system in compliance. Overall good operation.

HUC 03150105-Coosa River below Rome and Chattooga River Basin

Water System Name	Water Source Name	Number of Intakes	Reservoir in Use?	Number of Water Plants	Known and Potential Raw Water Quality Problems	Other Comments and Recommendations
City of Summerville - 0550003	Raccoon Creek	1	Y	1	Shallow source with flashing problems. Problems with a abandoned poultry house pond ½ mile upstream of intake. Overflow of ponds spike ammonia chloride and causes taste and odor problems. Some potential pollution concerns from potential development upstream.	Water system in compliance. Overall good operation. City needs to work with landowner of poultry house pond to prevent further degradation of water. Also City needs to work with county to identify sources of erosion and sedimentation and take steps to implement BMPs to prevent further degradation of water.
City of Lafayette - 2950002	Dry (Duck) Creek	1	N	1	Shallow source with past drought problems but not the primary water source for the city. Known rapid turbidity changes and taste and odor problems. Upstream drainage area primarily agricultural land use.	Water system in compliance but consistent problems with maintenance, staffing and optimized treatment. City needs to consider other options for water supply and to identify sources of erosion and sedimentation and take steps to implement BMP to prevent further degradation of water.

5.1.5 Navigation

The Coosa River within Georgia is not used for commercial navigation purposes. Although the channel was authorized for navigation to Rome, Georgia in the Rivers and Harbors Act of 1945, the benefit was not considered worth the federal investment. It should be noted, however, that the Alabama River is navigable to Montgomery, and that it is conceivable that Alabama will request releases from Allatoona and/or Carters through the ACT allocation negotiation to support required downstream channel flows. Georgia is opposed to using storage volume in these lakes for this purpose.

5.1.6 Waste Assimilation Capacity

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. If this becomes the case, EPD will require more treatment at water treatment plants.

5.1.7 Assessment of Ground Water

Ground water is a generally abundant and useful source of water for a variety of industries and municipalities in the area of northwest Georgia which includes the Coosa basin. Ground water zones are based on underlying geology and their rock units, and may cut across surface water basin boundaries. Therefore, the general basin boundaries and the defined HUC units in particular are relatively arbitrary designations from the groundwater perspective. In the eastern portion of this basin there is a distinct dividing line between hard, metamorphic rock with extremely limited groundwater potential from the overlying saprolite unit or fracture aquifer (in the Blue Ridge-Piedmont areas) and those areas to the northwest with sedimentary rock units of good to excellent groundwater potential (the Valley and Ridge province of northwest Georgia). This ground water divide generally mirrors the eastern borders of Murray, Gordon, and Bartow Counties, then swings to the west through far northwestern Paulding and southern Polk County. To the south and east of the line, which are part of the Blue Ridge and Piedmont zones, there is somewhat limited ground water potential; while to the northwest in the Valley and Ridge, there are spots of very abundant ground water.

Blue Ridge-Piedmont Unit: (Eastern-most portions of HUC 3150101, HUC 03150102, HUC 03150104)

There is currently a small, but growing use of ground water in these areas. Industry is almost nonexistent, but small municipalities such as Pickens County, the City of Jasper, the City of Ellijay, and Paulding County proper are either presently using or investigating the use of ground water to supplement their existing surface water usage. Water quality is fine, though water quantities can sometimes be quite meager. Because recharge regions are not extensive, pumping by larger users can lead to localized drawdowns of water levels, which can possibly dry out local existing domestic wells and springs.

Valley & Ridge: (Western portions of HUC 3150101, HUC 03150102, HUC 03150104; all of HUC 03150103, HUC 031050105)

Ground water is used extensively throughout this area, both as a supplement to surface water and as a sole-source for some municipalities and industries. Industrial operations in northwest Georgia are generally using ground water, while some of the

cities use both surface water and ground water. Carbonate rocks (limestones & dolomites) can provide large amounts of water where found. Once tapped, large users withdrawing significant amounts of ground water can locally lower a water table with their withdrawals, leading to potentially significant impacts in the local area. Springs may cease flowing and dry up with such lowered water tables. Limestone is also susceptible to the creation of solution caverns and further connected pathways forming. This can lead to two significant problems: sinkhole formation and contamination of ground water by surface water.

Sinkhole Formations

Sinkholes and other collapse features (in karst terrain) may impact surface structures and topography. As the water table declines, the newly created airspace often cannot support the cave roofs and sometimes the ceilings of these features can begin to subside or collapse. Buildings can easily be cracked or lost into the hole; water, gas and electric lines sheared, roads and rails destroyed, streams 'lost' as the water drains underground and pastures modified.

The general recommendation for large withdrawals in a karst (limestone) area is to refrain from extensive dewatering resulting in a large drawdown of the local water table. This may be accomplished at the Water Resources Management Program permitting stage either by reducing withdrawals to a more manageable amount or by requiring the re-injection of the withdrawn water back into the aquifer away from the operation. This too raises water levels in the aquifer and inhibits the formation of sinkholes.

Care should be taken to limit what is put in the enclosed lows of the sinkholes. Surface water runoff should be directed away from sinkholes; they should not be used as a ready means of collecting and getting rid of surface water runoff in urban areas. Nor should sinkholes be used as a convenient solution for solid waste disposal. Eventually the water or leachate from garbage/solid waste will enter the drinking water of the underground aquifer and show up in the water quality samples during drinking water testing. The EPD groups of Land Protection and Well Head Protection may be able to handle some of these compliance issues.

Ground Water/Surface Water Interactions

Sinkholes and solution voids also provide direct access between surface water and ground water. Surface runoff collects in many of the closed lows such as sinkholes and by draining into the sinkhole, can lead directly to contact with the ground water in the underground aquifer. Such mixing of differing waters is a potential health hazard, since such surface runoff can easily contain pollutants and bacteria that may contaminate the groundwater. Drinking Water unit has a special unit, "Groundwater under the influence of surface water", which monitors this possibility.

Limited growth has occurred in this region, with a very low amount of agricultural irrigation. Other than very localized problems, there are generally no ground water quantity problems in this area.

Specific Ground Water Concerns

Specific groundwater concerns from certain portions of the basin and select recommendations are noted below.

Active sinkhole formation because of dewatering has occurred in the following areas:

a) Near Kingston in Bartow County in the 1970's. A rock quarry lowered the water table during mining operations, creating many sinkhole collapse features. Once the operation closed and the dewatering stopped, sinkhole formation ceased. (HUC 03150104)

b) Near Fairmont in Gordon County in 1987-1988. The Vulcan crushed limestone quarry began dewatering the quarry, extensive sinkhole formation occurred. Vulcan began to inject the dewatering water back into the aquifer away from the quarry, causing aquifer water levels to rise and slowing the formation of sinkholes. This operation was quite expensive and eventually Vulcan abandoned the quarry. With dewatering stopped, water levels rose to regional levels and sinkhole formation stopped. (HUC 03150102)

c) Near Rome in Floyd County, late 1990's. Current quarrying operations by Florida Rock may result in the occasional formation of sinkholes near Berry College. (HUC 031050105)

d) Near Ellijay in Gilmer County, late 1990's. The current dewatering of a Filler Products underground marble mining operation has resulted in the formation of new and expanding sinkholes in this area. (HUC 03150102)

e) Potential concern has been exhibited by the public regarding a proposed new Florida Rock quarry operation in the area of Cave Springs, Georgia. Some are concerned that any potential dewatering at this mine may lead to hydrologic changes or even dewatering of the public drinking water source at the spring at Cave Springs. This could lead to difficulties with the public drinking water supply of Cave Springs. (HUC 031050105)

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

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

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[1]		pH	Temperature (other than trout streams)[1]	
Use Classification	30-Day Geometric Mean[2] (MPN/100 ml)	Maximum (MPN./100 ml)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise (°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[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...

standards for major lakes where control of nutrient loading is required to prevent problems associated with eutrophication. Standards have been adopted by the Board of Natural Resources for West Point Lake, Lake Walter F. George, and Lake Jackson. Clean Lakes Phase One Diagnostic Feasibility Studies are currently ongoing for Carters Lake and Lake Allatoona in the Coosa River basin. Final reports for both studies are projected for 1998, at which time the need for site-specific standards will be evaluated.

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 that 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. In addition to monthly stream sampling, a portion of the work with the USGS involves continuous monitoring at several locations across the state. 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 1996-1997 assessment were collected by other federal, state, and local governments, universities, contracted Clean Lakes projects, and utility companies. Trend monitoring stations located in the Coosa River basin in 1994 are shown in Figure 5-1.

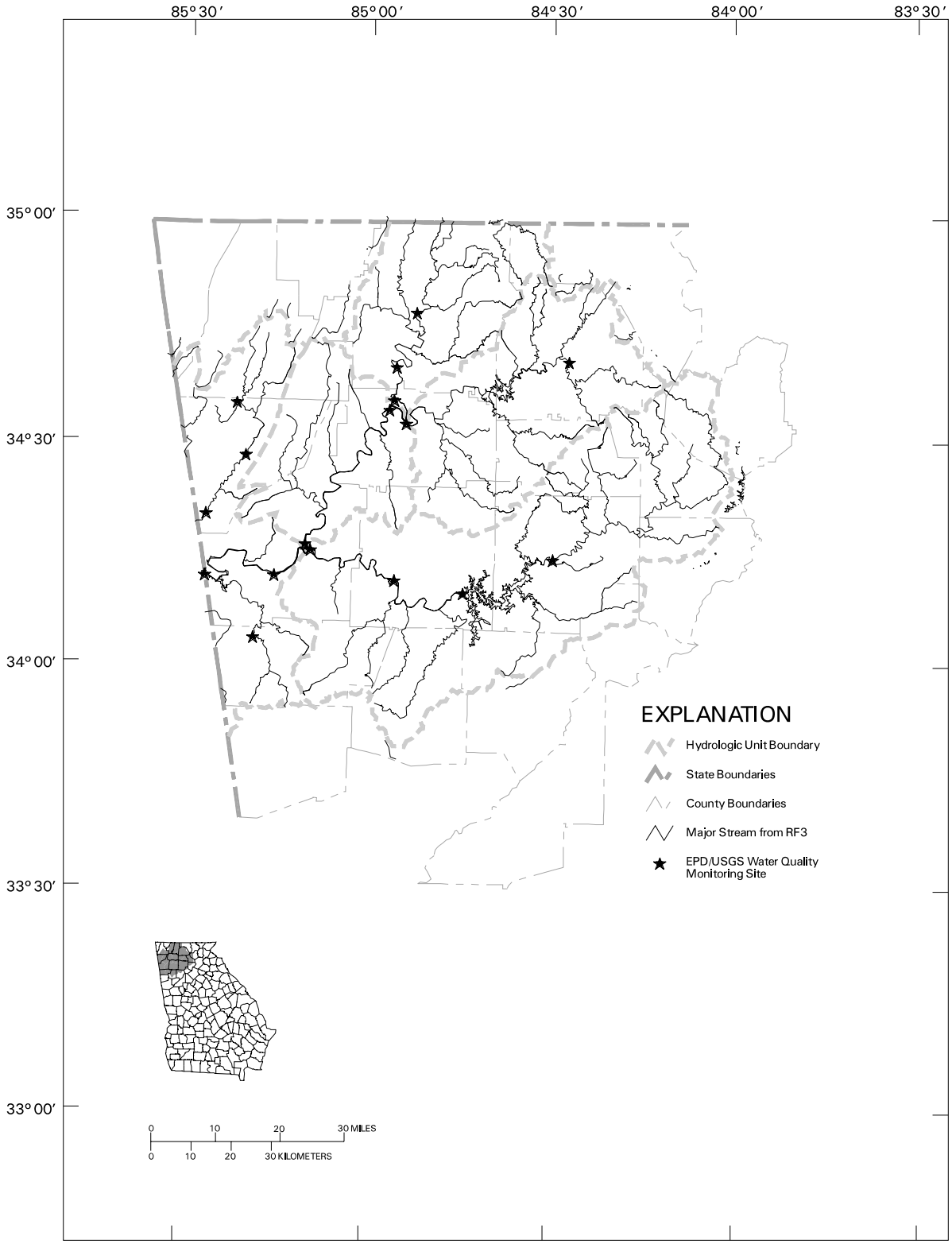

Figure 5-I. Coosa Basin Fixed Sampling Station Locations

Focused Trend Monitoring in the Coosa 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 Coosa, Tallapoosa, and Oconee basins during the 1996 sampling.

Figure 5-2 shows the focused trend monitoring network for the Coosa basin used in 1996. During this period statewide trend monitoring was continued at the 37 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 Coosa, Tallapoosa 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.

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.

Lake Monitoring

EPD has maintained monitoring programs for Georgia's public access lakes for many years. In the late 1960s, a comprehensive statewide study was conducted to assess fecal coliform levels at public beaches on major lakes in Georgia as the basis for water use classifications and establishment of water quality standards for recreational waters. In 1972, EPD staff participated in the US EPA National Eutrophication Survey which included 14 lakes in Georgia. A post-impoundment study was conducted for West Point Lake in 1974. Additional lake monitoring continued through the 1970s. The focus of these studies was primarily problem/solution oriented and served as the basis for regulatory decisions.

Trophic Condition Monitoring

In 1980-1981, EPD conducted a statewide survey of public access freshwater lakes. The study was funded in part by US EPA Clean Lakes Program funds. The survey objectives were to identify freshwater lakes with public access, assess each lake's trophic condition, and develop a priority listing of lakes as to need for restoration and/or protection. In the course of the survey, data and information were collected on 175 identified lakes in 340 sampling trips. The data collected included depth profiles for dissolved oxygen, temperature, pH, specific conductance, and Secchi disk transparency and chemical analyses for chlorophyll *a*, total phosphorus, nitrogen compounds, and turbidity. The three measures of Carlson's Trophic State Index were combined into a single trophic state index (TTSI) and used with other field data and observations to assess

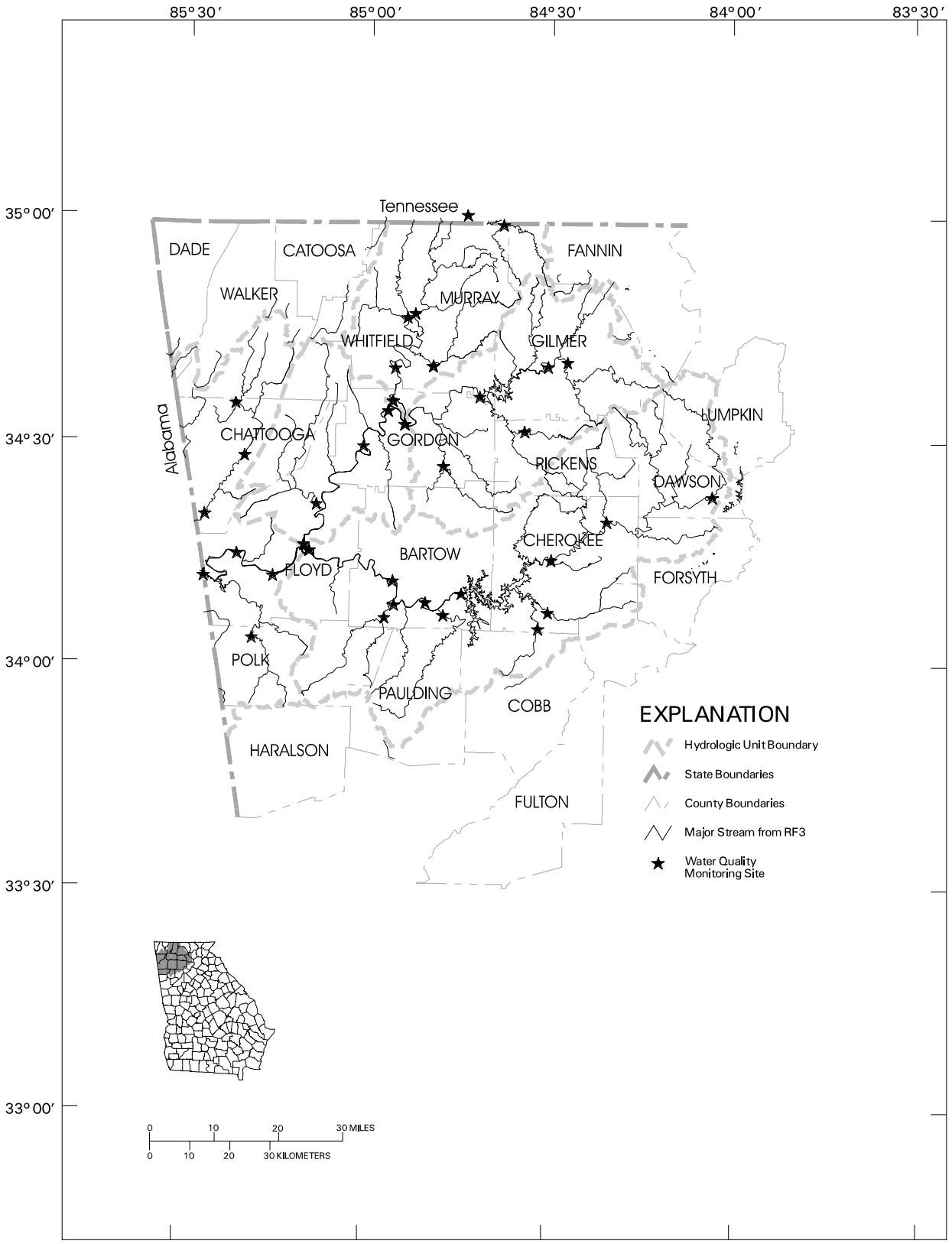

Figure 5-2. Coosa Basin Trend Monitoring Network Station Location, 1996

the trophic condition of each lake. Higher values of the TTSI represent more eutrophic, less desirable conditions. Monitoring efforts have continued since the 1980-1981 Lake Classification Survey with a focus on major lakes (those with a surface area greater than 500 acres), and the TTSI has continued to be employed as a tool to mark trophic state trends. The major lakes in the Coosa basin are listed in Table 5-4 and are ranked according to the TTSI for the period 1984-1993. Greater study emphasis has been placed on those lakes with consistently higher rankings. The major lakes monitoring project was suspended in 1994 due to a lack of field and laboratory resources. The work on major lakes in the future will be a part of the River Basin Management Planning process.

Table 5-4. Major Lakes in the Coosa Basin Ranked by Sum of Trophic State Index Values, 1980-1993

1984		1985		1986		1987		1988	
Carters	161	Allatoona	136	Allatoona	157	Carters	166	Allatoona	<141
Allatoona	135	Carters	134	Carters	144	Allatoona	<143	Carters	<127
range for state:	120-205	*range for state:*	116-188	*range for state:*	114-177	*range for state:*	<108-184	*range for state:*	111-178
1989		**1990**		**1991**		**1992**		**1993**	
Carters	179	Allatoona	146	Allatoona	167	Allatoona	156	Allatoona	158
Allatoona	171	Carters	118	Carters	135	Carters	143	Carters	154
range for state:	123-209	*range for state:*	118-182	*range for state:*	121-193	*range for state:*	131-194	*range for state:*	122-195

Note: Higher values represent more eutrophic conditions.

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 that 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 5-5. 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.

PCBs in Fish in the Coosa River

In 1976, the Department of Natural Resources issued an advisory recommending that people not eat fish taken from the Coosa River from Rome to the Georgia-Alabama border. Additionally, the Coosa River was officially closed to commercial fishing by the

Table 5-5. 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

Board of Natural Resources. Both of these actions were taken because of contamination of fish in the Coosa River with significant concentrations of Polychlorinated Biphenyls (PCBs). Section *391-4-3-.04 Waters Open to Commercial Fishing, Amended* of the Georgia Fishing Regulations delineates those portions of the Coosa River, Etowah River, and Oostanaula River (including tributaries to them), and the Georgia portion of Lake Weiss that were closed to commercial fishing.

The contamination of fish in the Coosa River was attributed to the General Electric Company's plant in Rome, which began operations in 1954. Efforts were made in the late 1970s and 1980s by both EPD and USEPA to ensure that releases of PCBs from the facility to the environment were minimized. The facility was closed in June 1998. Currently, the facility has a NPDES permit, which requires monitoring and control of storm water discharges of PCBs, and several areas on the facility's property are regulated under the Resource Conservation and Recovery Act. Both of these regulatory activities are under the purview of the EPD.

Measurements of PCBs in the late 1970s revealed concentrations of PCBs in fish greater than 30 parts per million (ppm) in some instances. The Food and Drug Administration's (FDA) Action Level for PCBs at that time was 5.0 ppm. From 1977 to 1990, PCB concentrations in fish tissue were monitored extensively in the Coosa River. The monitoring strategy consisted of measuring PCB concentrations in tissue of a single species of fish. Each year approximately 45 individual channel catfish of approximately 1 pound were collected for analysis of fillet tissue. From 1977 to 1984, the concentrations of PCBs monitored in catfish from the Coosa River decreased dramatically from concentrations greater than 30 ppm to less than 2 ppm. After 1984, the changes in PCB concentration on a year by year basis were not as dramatic, but continued to decline to an average concentration of 0.39 ppm in 1990. The FDA's Action Level of 5.0 ppm in effect at the beginning of the study in 1977 was officially changed to a Tolerance Level of 2.0 ppm in 1984.

In 1991, EPD began monitoring Coosa River fish in a manner consistent with the newly instituted statewide monitoring plan. As a part of that strategy, fillet tissue from three to five individual fish is composited and analyzed for 43 different contaminants, including PCBs. The goal of the monitoring strategy is to provide at least 3 composites of each species tested, and to test at least two important indicator species at each location.

Several different species of fish have been evaluated in the Coosa River with this strategy. For example, PCB concentrations in smallmouth buffalo measured in 1991, 1993, and 1995 were 5.75, 1.15, and 0.64 ppm, respectively. Other species monitored at some point since 1991 and corresponding PCB concentrations include striped bass (1.55 ppm in 1992), largemouth bass (0.33 ppm in 1993), and black crappie (0.13 ppm in 1991). Fish in the Etowah and Oostanaula rivers have also been monitored for contaminants. Low concentrations of PCBs have been found in some species of fish in both rivers. However, fish tissue concentrations of PCBs in both of these rivers are lower than in the Coosa.

In 1994, EPD began utilizing a "risk-based" approach to develop fish consumption guidelines for the state's waters. The EPD's guidelines are based on the use of US EPA potency factors for carcinogenicity and reference doses for noncancer toxicity, whichever is most protective. Inputs used in the derivation of guidelines include a 1×10^{-4} risk level for cancer, a 30 year exposure duration, 70 kg as body weight for an adult, and 70 years as the lifetime duration. A range of possible intakes from a low of 3 g/day to a high of 30 g/day are evaluated and one of four different recommendations is made: no restriction, limit consumption to 1 meal per week, limit consumption to 1 meal per month, or do not eat.

Recommendations are currently in place for several species of fish in the Coosa, the Etowah and the Oostanaula Rivers. The most severe restrictions (do not eat) are in place for two species in the Coosa; smallmouth buffalo, and channel catfish, and one species in the Etowah, smallmouth buffalo. All other species listed for theses rivers allow either limited consumption or no restriction of fish consumption.

The current recommendations are for the rivers themselves, and do not specifically list all tributaries. This contrasts to past approaches taken where all tributaries were automatically listed under fish consumption advisories.

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 Coosa, Tallapoosa, 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

EPD assesses water quality data to determine if water quality standards are met and if the waterbody supports its classified use. If monitoring data show 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 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 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 flow) 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.

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 since 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 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 11to 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 criteria 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. A waterbody was 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.

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 Coosa River basin. Most of these results were previously summarized in the report *Water Quality in Georgia, 1996-1997* (Georgia DNR, 1998). Results are presented by HUC. A geographic summary of assessment results is provided by HUC in Figures 5-3 through 5-7.

Conasauga River Basin (HUC 03150101)

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 7 trend monitoring stations located within this subbasin during the 1996 period, four of which were on the mainstem. Historically, three 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 by both point and nonpoint source pollution.

Metals

Violations of water quality standards for metals occurred in one Conasauga River mainstem segment and in 7 tributary segments. Lead standards were exceeded in the mainstem due to a water pollution control plant discharge. Zinc, copper and cadmium standards were exceeded in tributary stream segments due primarily to nonpoint sources in six segments and to a water pollution control plant discharge in one segment.

Bacteria

The standard for fecal coliform bacteria was exceeded in four segments. The exceedances, two in mainstem segments and two in tributary segments, were due to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources, and animal wastes.

Toxicity

Chatsworth WPCP, the only major municipal discharger in this basin, has exhibited intermittent toxicity to aquatic life on Whole Effluent Toxicity (WET) tests.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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 this section of the Coosa River basin are listed in the following tables. The data shown in these tables are the new guidance 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 and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

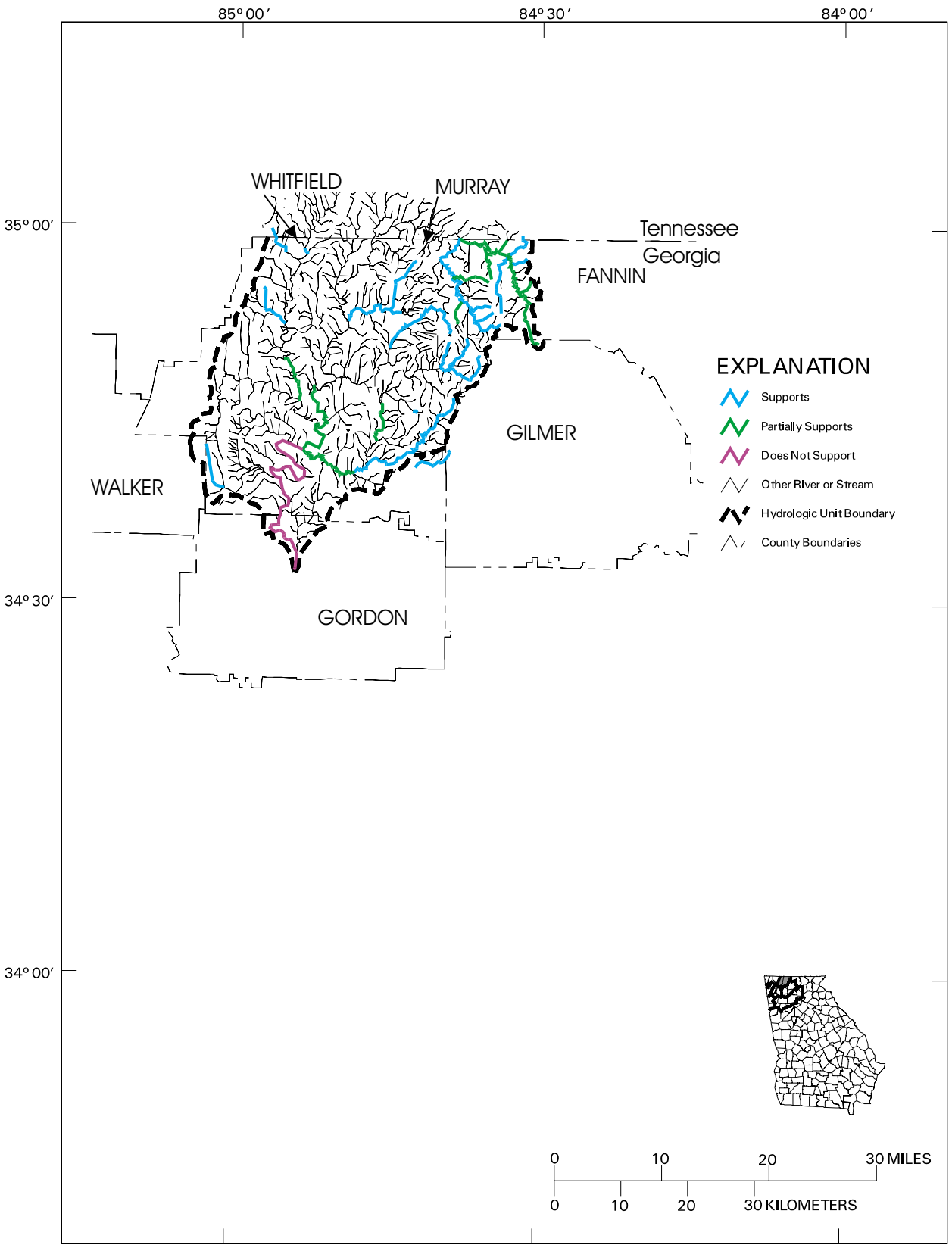

Figure 5-3. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150101

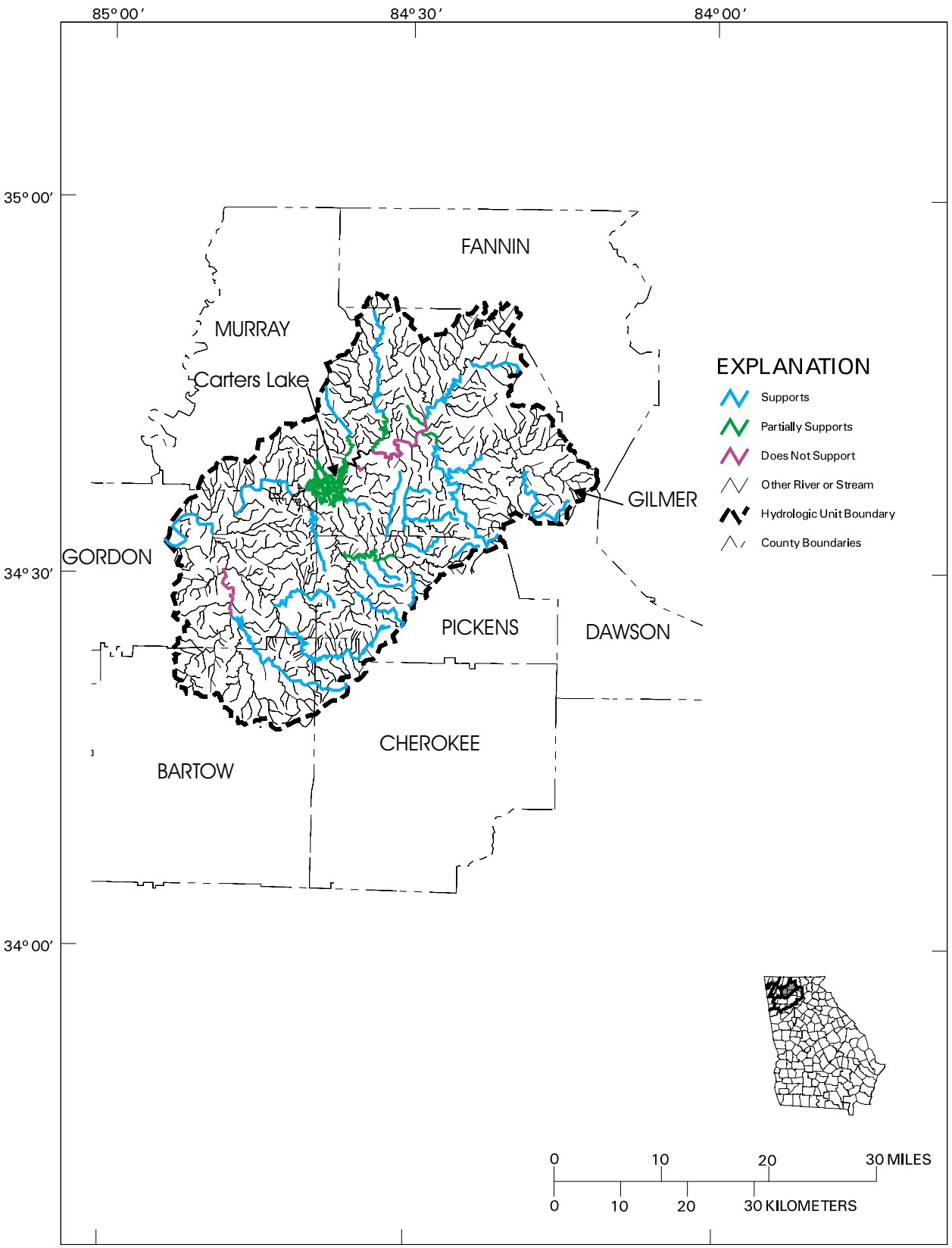

Figure 5-4. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150102

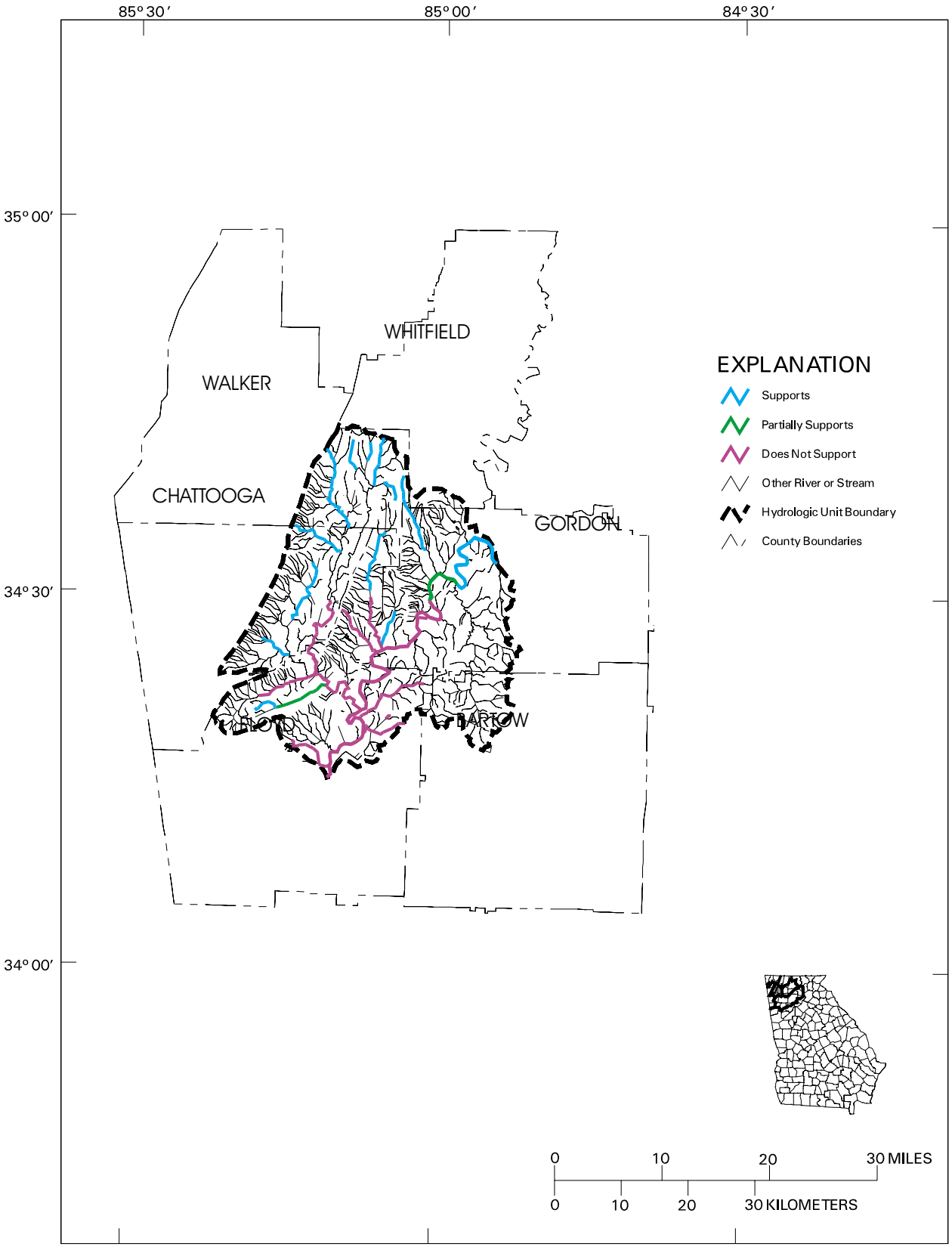

Figure 5-5. Assessement of Water Quality Use Support in the Coosa River Basin, HUC 03150103

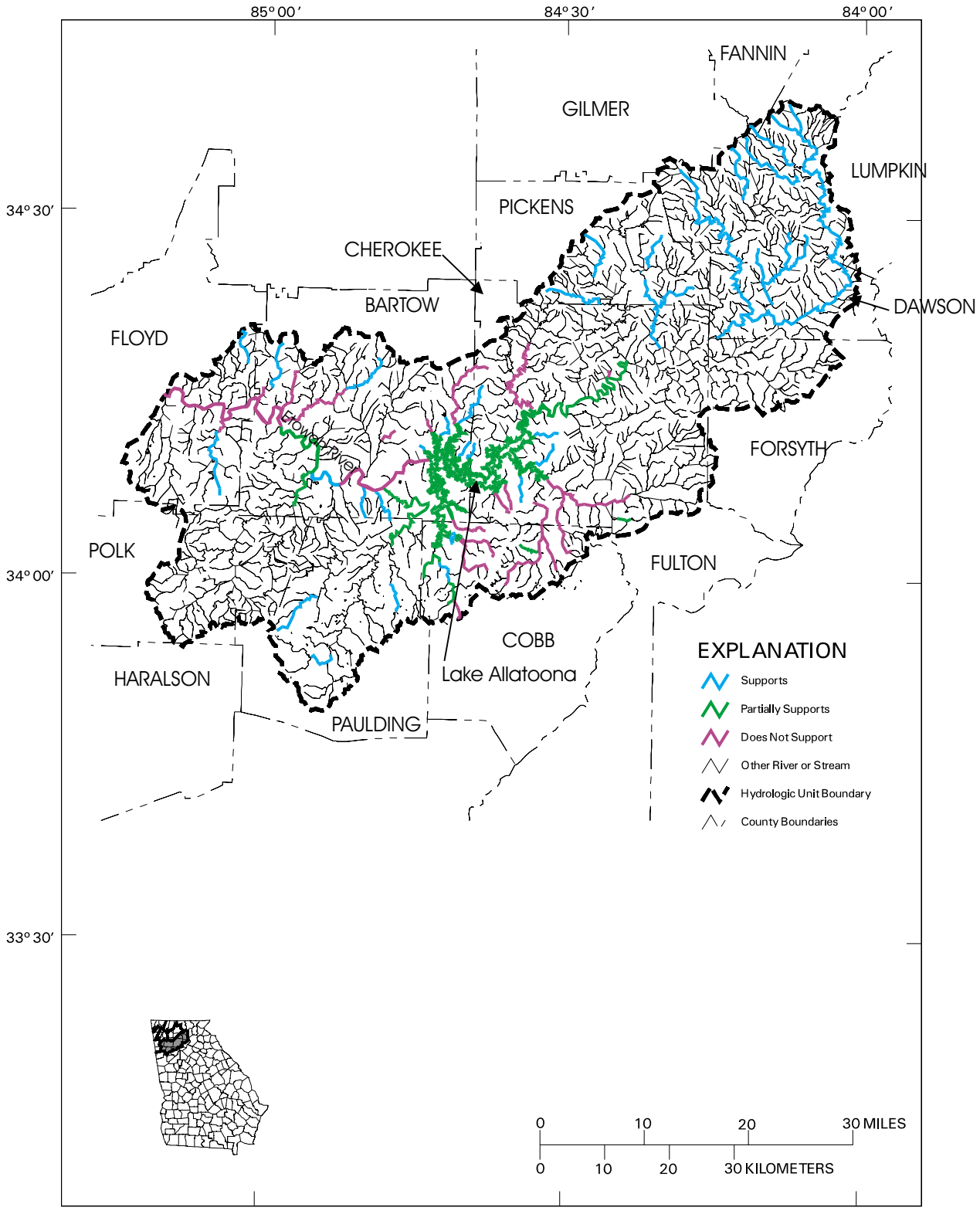

Figure 5-6. Assessement of Water Quality Use Support in the Coosa River Basin, HUC 03150104

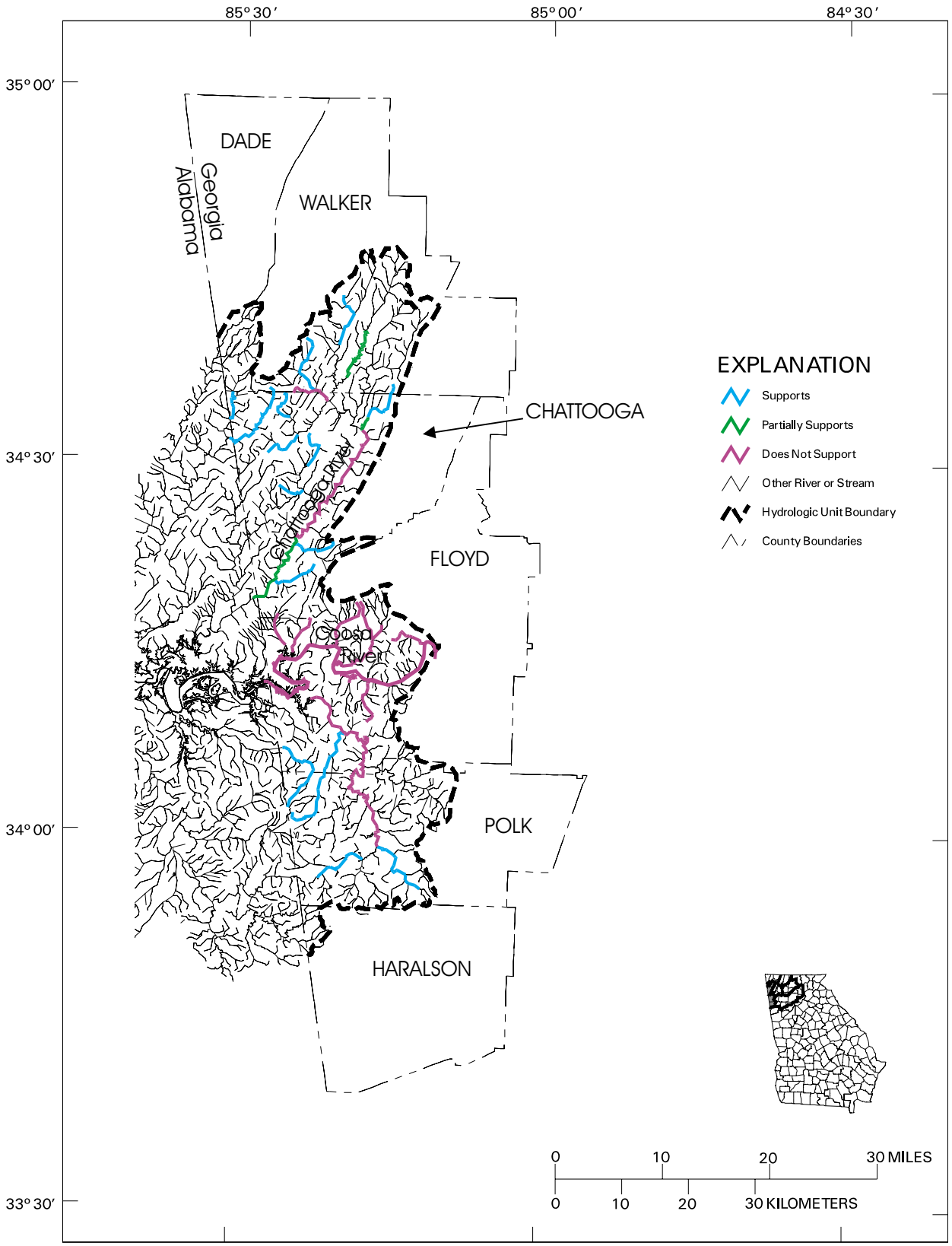

Figure 5-7. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150105

Fish Consumption Guidelines–Jacks River: Fannin County

Species	Site Tested	Recommendation	Chemical
Brown Trout	Watson Gap	No Restrictions	

Fish Consumption Guidelines–Swamp Creek: Whitfield County

Species	Site Tested	Recommendation	Chemical
Redeye Bass	Redwine Cove Road	1 meal per week	Mercury

Coosawattee River Basin: Streams and Rivers (HUC 03150102)

Appendix E, Table E-2 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 6 trend monitoring stations located within this subbasin during the 1996 period, three of which were on the 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.

Bacteria

The standard for fecal coliform bacteria was not met in nine segments. The exceedances, one in a mainstem segment and eight in tributary segments, were due to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources, and animal wastes.

Toxicity

Ellijay WPCP, the only major municipal discharger in this basin, has not exhibited toxicity to aquatic life on Whole Effluent Toxicity (WET) tests.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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

Fish tissue quality in Carters Lake has been found to be very good, with one recommended consumption limit on large walleye over 16 inches in length due to the tissue mercury content. Current guidelines for eating fish from Carters Lake and this section of the Coosa River Basin are listed in the following tables. Talking Rock Creek flows into the pump-storage reregulation reservoir located at Carters Lake. 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 and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines–Carters Lake

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemical
Largemouth Bass		No Restrictions	No Restrictions	
Spotted Bass	No Restrictions	No Restrictions		
Channel Catfish		No Restrictions	No Restrictions	
Walleye		No Restrictions	1 meal per week	Mercury

Fish Consumption Guidelines–Talking Rock Creek: Pickens County

Species	Site Tested	Recommendation	Chemical
Redeye Bass	Downtown Talking Rock at Fire Department	1 meal per week	Mercury

Coosawattee River Basin: Lakes (HUC 03150102)

Carters Lake

The Coosawattee River basin contains Carters Lake, formed when the U.S. Army Corps of Engineers (COE) constructed Carters Lake Dam on the Coosawattee River. Work on the project was begun in 1962 and completed in 1977. The Coosawattee River is the major tributary that empties into Carters Lake. Carters Lake is located 25 miles north of Lake Allatoona in the Blue Ridge Mountains, about 60 miles north of Atlanta and about 50 miles south of Chattanooga, Tennessee. This places it in the northwest corner of Georgia. Of the 27 major lakes in Georgia (over 500 acres), Carters ranks 16th in size. The State Water Use Classification of Carters Lake is Recreation. The major use for this lake is flood control and power generation. Recreation is an additional benefit. Public access is provided through 6 public recreation areas, a marina and a dam site overlook. The drainage area above the dam site is 376 square miles. Average discharge from the dam is 770 cfs. Normal dam pool elevation is maintained at 1, 072 feet, with a maximum flood control ability of up to 1,099 feet. There are 62 miles of shoreline and the lake has a maximum volume storage of 242,200 acre feet. There is one point source discharge located on the Coosawattee River which is the City of Ellijay, NPDES # GA0021369, located 10 miles above the lake. It is currently permitted for a 2.5 million gallons per day (mgd) discharge.

The power plant located at the dam on Carters Lake annually generates approximately 500 million kilowatt hours. The system is designed with a reregulation dam and reservoir. At times of low energy need, the water from the reregulation reservoir is pumped back up into the main lake and reused for generation. The pump-storage operation can cause the reregulation reservoir level to fluctuate as much as 10 feet in 6 hours. Main lake levels may fluctuate as much as 4 feet during the week due to this pumping action.

Carters Lake was part of the EPD Georgia Clean Lakes Classification Survey of 1980-1981. The lake was documented as a Category C, one that had no immediate need of restorative action. Carters Lake was a part of the EPD Major Lakes Monitoring Project from 1984 through 1993. It has always ranked very high in water quality with no problems or immediate threats to documented conditions. Carters Lake is currently listed

as partially supporting the designated use of recreation due to the presence of Fish Consumption Guidelines (see Appendix E, Table E-6). A Clean Lakes Phase One Diagnostic Feasibility Study of Carters Lake was undertaken by EPD in 1996. Field collections and sampling were completed in early 1997. A draft report will be completed in 1998.

Oostanaula River Basin (HUC 03150103)

Appendix E, Table E-3 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 four trend monitoring stations located within this subbasin during the 1996 period, three of which were on the 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

Violations of water quality standards for metals occurred in four tributary segments. Lead, mercury and copper standards were exceeded due to nonpoint sources in two segments and to a water pollution control plant discharge in two segments.

Bacteria

The standard for fecal coliform bacteria was exceeded in two mainstem segments and two tributary segments. The exceedances were due to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources, and animal wastes.

Toxicity

Calhoun WPCP, the only major municipal discharger in this basin, has not exhibited toxicity to aquatic life on Whole Effluent Toxicity (WET) tests.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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

The Oostanaula River from the State Highway 156 Bridge to the confluence of the Oostanaula and Etowah Rivers, and all streams flowing into the Oostanaula River between those two points, have been closed to commercial fishing since 1976. Fish tissue quality has improved in the Oostanaula River with declining PCB residues, but 4 out of the 6 tested species still carry recommendations for restricted consumption. Current guidelines for eating fish from the Oostanaula River and Ponder Branch are listed in the following tables. The data shown in these tables are the new guidance which was published in the *1998-1999 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 and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines–Carters Lake Ponder Branch: Walker County

Species	Site Tested	Recommendation	Chemical
Redeye Bass	Ga. Hwy 136	No Restrictions	

Fish Consumption Guidelines–Oostanaula River

Species	Site Tested	Recommendation	Chemicals
Spotted Bass	State Hwy. 140	No Restrictions	
Bluegill	State Hwy. 140	No Restrictions	
Largemouth Bass	State Hwy. 140	1 meal per week	PCBs
Striped Bass	State Hwy. 140	1 meal per month	PCBs
Smallmouth Buffalo	State Hwy. 140	1 meal per month	PCBs
Channel Catfish	State Hwy. 140	1 meal per month	PCBs

Etowah River Basin: Streams and Rivers (HUC 03150104)

Appendix E, Table E-4 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 12 trend monitoring stations located within this subbasin during the 1996 period, seven of which were on the mainstem. Historically, five 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

Violations of water quality standards for metals occurred in one mainstem segment and in nine tributary segments. Copper standards were exceeded in the mainstem due to a nonpoint sources. Copper, lead, zinc, cadmium, selenium and arsenic standards were exceeded in tributary segments due primarily to urban runoff in eight segments and to a power plant operation in one segment.

Bacteria

The standard for fecal coliform was exceeded in 25 segments. The exceedances, three in mainstem segments and 22 in tributary segments, were due to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources, and animal wastes.

Toxicity

Most of the seven major municipal wastewater treatment facilities in this HUC have not exhibited toxicity to aquatic life on Whole Effluent Toxicity (WET) tests. Only the Cobb County Noonday Water Reclamation Facility has had intermittent toxicity shown on these tests.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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

The Etowah River from the U.S. Highway 411 Bridge downstream to the confluence of the Oostanaula and Etowah Rivers, and all streams flowing into the Etowah River between those two points, have been closed to commercial fishing since 1976 due to PCB concentrations in fish tissue. Fish tissue quality has improved in the Etowah River with declining PCB residues, but 3 out of the 6 tested species still carry recommendations for restricted consumption in this section of the river. Guidelines for eating fish from this section of the Coosa River basin are listed in the following tables. The data shown in these tables are the new guidance which was published in the *1998-1999 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 and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines–Etowah River: Above Lake Allatoona

Species	Site Tested	Recommendation	Chemical
Spotted Bass	York Street	1 meal per week	PCBs/Mercury
Golden Redhorse	York Street	No Restrictions	

Fish Consumption Guidelines–Etowah River: U.S. Hwy 411 to Rome, Georgia

Species	Site Tested	Recommendation	Chemicals
Channel Catfish	U.S. Hwy 411	No Restrictions	
Largemouth Bass	U.S. Hwy 411	1 meal per week	PCBs / Mercury
Striped Bass	U.S. Hwy 411	No Restrictions	
Spotted Bass	U.S. Hwy 411	1 meal per week	PCBs
Bluegill	U.S. Hwy 411	No Restrictions	
Smallmouth Buffalo	U.S. Hwy 411	Do Not Eat	PCBs

Fish Consumption Guidelines–Stamp Creek: Cherokee County

Species	Site Tested	Recommendation	Chemical
Rainbow Trout	Pine Log WMA	No Restrictions	

Etowah River Basin: Lakes (HUC 03150104)

Lake Allatoona

The Etowah River basin contains Allatoona Reservoir, more commonly called Lake Allatoona. The lake was formed when the U.S. Army Corps of Engineers (COE) constructed Lake Allatoona Dam on the Etowah River, a tributary of the Coosa River near Cartersville, Georgia. Construction was authorized in the Flood Control Act of 1941 and the project completed in 1950, at a cost of $31.5 million. This lake ranks 10th in size for Georgia lakes. Lake Allatoona is located about 30 miles northwest of Atlanta in the

Coosa River basin. Portions of the lake watershed lie within 8 separate counties: Bartow, Cherokee, Cobb, Dawson, Forsyth, Fulton, Paulding and Pickens. The lake has two major arms: Allatoona Creek and the Etowah River. The reservoir was designed for flood control, power generation, recreation, fishing and wildlife habitat. The lake designated use classification is Recreation and Drinking Water Source. An adjoining separate impoundment, Lake Acworth, was constructed at the same time as Lake Allatoona. Although construction was completed and filling operations began during the same period as Allatoona, Lake Acworth is not a part of Lake Allatoona, and the state water use classification is Fishing.

Historical limnological data on Lake Allatoona are limited. The 1975 U.S. EPA National Eutrophication Survey was one of the earliest studies on the lake. The Georgia Clean Lakes Classification Survey was conducted in 1980-1981 and the Georgia Major Lakes Monitoring Project (MLMP) from 1984 until 1993. The 1993 report listed a Carlson's total trophic state index of 158 for Lake Allatoona, in a range for all Georgia major lakes of 122-196 (with lower numbers indicating better, less eutrophic conditions). Historical trends for Lake Allatoona show an increase in phosphorus and chlorophyll *a* values and a resulting decrease in water clarity or Secchi depth. In 1984 a Lake Allatoona Discharge Guidelines for Sensitive Areas report was completed. Limits were suggested for new point source discharges to the lake and loads were to be based on modeling considerations. Water quality profiles were conducted at proposed discharge points on Lake Allatoona in 1983 and again in 1984. In 1984, field data was generated in Cherokee County on proposed discharge points. It was noted that the sites studied were sensitive and that special requirements would probably be necessary to allow discharges. The U.S. Army Corps of Engineers conducted studies in 1990-1991. Their results indicated that the lake was continuing to move from a mesotrophic state to an eutrophic state. A Clean Lakes Phase One Diagnostic Feasibility Study was initiated on Lake Allatoona in 1992. This study was conducted by the A. L. Burruss Institute of Public Service at Kennesaw State University with local partners under contract with the State of Georgia, recipient of the Clean Lakes Grant from the U.S. EPA. The final report projected completion date is Summer 1998; a review draft was released in February 1998 (Burruss, 1998). This draft report provides the following summary of current conditions:

- Limited historical limnological data suggest Lake Allatoona is becoming increasingly eutrophic. In Lake Allatoona, phosphorus is the primary limiting nutrient for algal growth, and hence the key factor in controlling eutrophication. The Etowah River contributes most of the water and phosphorus load to the lake, and limnological data suggests most of this phosphorus is released from nonpoint sources in this mostly rural watershed. However, chlorophyll *a* concentrations in embayments receiving discharge from other tributaries were generally higher. Because Lake Allatoona's morphometry is complex, these semi-enclosed embayments appear to be largely independent of the main lake, and water quality in each embayment is influenced to a greater extent by the shape of the embayment and the discharge of tributaries entering the embayment from the urban/suburban parts of the watershed.
- While rural nonpoint sources of pollution are largely responsible for the lake's current overall trophic status, influences of urban development on lake water quality were observed in the Little River embayment of the lake. This embayment is strongly eutrophic as documented by chlorophyll *a* concentrations generally twice as high as those at the dam pool. High concentrations of phosphorus in water entering into the Little River embayment from Noonday Creek (a small watershed, which contains more than one-third of all urban development within the entire watershed) originate from both point sources and

nonpoint sources associated with urban development. Poor water quality within this embayment plainly demonstrates that urban development can shift trophic status in Lake Allatoona from transitional mesotrophic-eutrophic to eutrophic.

- From a human health perspective, there is need for some concern, but not alarm. Fecal coliform bacteria levels rarely exceeded state criteria within the lake. Higher levels measured in the tributaries suggest the potential for sudden input of fecal coliform bacteria during storm events. Few potential toxic substances were found above detectable levels in lake and tributary water. Only mercury and copper, at a single site, exceeded state water quality criteria. A single point source is not indicated for any of these substances.

The COE is developing a computer model for Lake Allatoona. In support of this effort, the Georgia EPD has conducted water quality monitoring over the 1996 and 1997 growing seasons for use in model calibration activities. The model has a projected completion date in 1998. Additional information is available through the U.S. Army Corps of Engineers, Mobile District.

Fish Tissue Quality

The 1996-1997 305(b) Report listed areas of Lake Allatoona as not fully supporting the water use classification of Recreation/Drinking Water Source. Fish consumption guidelines for restricted consumption of some sizes of carp, white bass, spotted bass and largemouth bass due to tissue PCB content indicated the partial support assessment for the entire lake. Regarding fish tissue, the draft Clean Lakes study (Burruss, 1998) concludes:

- Analyses of fish tissue revealed the presence of several chemicals, including arsenic, mercury, and PCBs, which have potential to cause toxicity to humans if present in sufficient concentrations. However, only PCBs and mercury were detected in species of fish monitored with frequency and in concentrations sufficient to cause concerns for human health from consumption, when the potential for cancer and non-cancer risks were evaluated using currently accepted risk-based approaches. These approaches assume consumption of fish with frequencies of one meal per week or greater, for periods of 30 to 70 years, with no decrease in contaminant concentrations during that time in fish.

Fish Consumption Guidelines–Lake Allatoona

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Crappie	No Restrictions			
Carp	No Restrictions	No Restrictions	1 meal per week	PCBs
White Bass		1 meal per week		PCBs
Largemouth Bass		No Restrictions	1 meal per week	PCBs
Spotted Bass	No Restrictions	1 meal per week		Mercury
Golden Redhorse		No Restrictions		
Channel Catfish	No Restrictions	No Restrictions		

Lake Acworth

In Lake Acworth, the City of Acworth, Lake Acworth Beach was closed to swimming in 1991 following the results of some fecal coliform bacteria monitoring. The 1996-1997 305(b) Report lists the Upper and Mid-Lake portions of Lake Acworth as partially supporting the use of fishing due to exceedences of the water quality standard for fecal

coliform bacteria (see Appendix E, Table E-6). In 1994-1995, water quality investigations of Lake Acworth and its watershed were conducted by Kennesaw State University under a contract with Cobb County. Based on the results of the study, Cobb County developed and implemented portions of an action plan for water quality improvements. In 1997 the City of Acworth and Cobb County conducted monitoring on Lake Acworth. The state standard for fecal coliform bacteria (minimum of 4 samples in 30 day period having a geometric mean of ≤ 200/100ml, over the May-October period), was met consistently at the swimming beach over the May-July 1997 monitoring period. Three feeder tributaries to Lake Acworth, Proctor, Butler and Acworth Creeks, did not meet the state fecal coliform bacteria standard over the May-June 1997 monitoring period. The City of Acworth re-opened Acworth Beach in 1998. Cobb County has plans to conduct watershed assessment studies on Proctor and Butler Creeks in the future.

Coosa River below Rome and Chattooga River Basins (HUC 03150105)

Appendix E, Table E-5 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 7 trend monitoring stations located within this subbasin during the 1996 period, three of which were on the Coosa mainstem and two of which were on the Chattooga mainstem. Historically, six 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 by both point and nonpoint source pollution.

Metals

Violations of water quality standards for metals occurred in one Coosa River mainstem segment and in one Chattooga River mainstem segment. Lead standards were exceeded in the Coosa River due to urban runoff. Copper and lead standards were exceeded in the Chattooga River due to a water pollution control plant discharge.

Bacteria

The standard for fecal coliform bacteria was not met in two Coosa River mainstem segments, two Chattooga River mainstem segments and in four tributary stream segments. These exceedences were due to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and animal wastes.

Toxicity

Most of the six major municipal wastewater treatment facilities in this HUC have not exhibited toxicity to aquatic life on Whole Effluent Toxicity (WET) tests. Only the Trion WPCP has had intermittent toxicity shown on these tests.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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

The Coosa River from the confluence of the Oostanaula and Etowah Rivers to the Georgia-Alabama boundary line, and all streams flowing into the Coosa River between those two points, have been closed to commercial fishing since 1976 due to

contamination of fish tissue by PCBs. Fish tissue quality has improved in the Coosa River with declining PCB residues, but 2 out of the 6 tested species still carry recommendations to not eat, and only one species has no restricted consumption recommended. Guidelines for eating fish from this section of the Coosa River Basin are listed in the following tables. The data shown in these tables are the new guidance which was published in the *1998-1999 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 and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines–Coosa River

Species	Site Tested	Recommendation	Chemicals
Smallmouth Buffalo	Rome, Ga. to State Line	Do Not Eat	PCBs
Largemouth Bass	Rome, Ga. to State Line	1 meal per month	PCBs
Black Crappie	Rome, Ga. to State Line	1 meal per week	PCBs
Striped Bass	Rome, Ga. to State Line	1 meal per month	PCBs
Spotted Bass	Rome, Ga. to State Line	No Restrictions	
Channel Catfish	Rome, Ga. to State Line	Do Not Eat	PCBs

Fish Consumption Guidelines–Chattooga River

Species	Site Tested	Recommendation	Chemical
Bluegill	Chattoogaville	No Restrictions	
Carp	Chattoogaville	No Restrictions	

5.2.5 Assessment of Fish and Wildlife Resources

Detailed, HUC-level assessments of fish and wildlife resources in the Coosa 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 on 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 occur 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 rivers' 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 at which 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 Conasauga and Jacks Rivers downstream of Tennessee Highway 74, and Coosawattee River system above Carters Lake.

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 Coosa basin, 427 river miles were evaluated. Of these, 45 miles were rated Superior (upper Conasauga and Jacks River), 148 miles were rated Outstanding (lower Conasauga, Coosawattee system above Carters Lake, and Etowah River above Lake Allatoona), and 224 miles were rated Significant (Oostanaula, Coosawattee below Carters Lake, and Etowah River below Lake Allatoona).

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, or foreign, 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 can significantly reduce the river's fishery biodiversity as well.

Recreational and Commercial Fish Resources

The Georgia Rivers Assessment work group also evaluated river segments and their associated tributatires from the point of view of commercial or sportfishing uses. This assessment provides a snapshort of current recreational and fishery conditions within major river segments. The evaluation made use of two criteria, weighted equally:

- Fishery uniqueness: The lack of an alternative commercial or recreational fishery anywhere within the state (3 points), within one of the seven fisheries management regions established by the Georgia DNR (2 points), or locally within a 50-mile radius of the resource under evaluation (1 point).
- Fishery demand: The popularity of the fishery, when compared to a similar fishery elsewhere in the state and measured by standard indicators of fishing pressure such as angler-days or the length of the waiting period for limited-entry fisheries. (Scoring: 1 to 3 points).

Stream segments were identified as "Qualifying" if at least one of the two scores was at least 2. Of the 427 miles evaluated in the Coosa Basin, 355 miles were rated as Qualifying,

Reservoir fisheries are also important within the Coosa basin. Lake Allatoona provides a healthy and popular fishery, with good fishing for crappie, spotted bass, striped bass, and other species. Carters Lake provides a high quality fishery for walleye, striped bass, and spotted bass.

The major threats to recreational and commercial fisheries vary by river segment. In general, however, two of the major threats are nonpoint source runoff from urban areas and disturbed lands, and the introduction of exotic (non-native aquatic species) into Georgia's rivers.

Wildlife Resources

Wildlife enriches humans aesthetically and spiritually, can serve as an indicator of environmental health, provide 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 which 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:

- Diversity of species and natural habitats in the river corridor
- Habitat value for species of special concern
- Percentage of river corridor in natural vegetation
- 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 Coosa River basin 414 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.

Within the Coosa River basin, a substantial amount of land area is controlled by the Chattahoochee National Forest. The Chattahoochee National Forest publishes and regularly updates a Land and Resource Management Plan which documents specific objectives and strategies for the management of wildlife habitat.

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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 Coosa 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 the assessment report *Water Quality in Georgia, 1996-1997* as a contributor to nonsupporting or partially supporting status was fecal coliform bacteria (399 out of 1,254 miles, or 32 percent of the stream miles which were assessed within the basin), followed by metals such as zinc, copper and lead (168 out of 1,254 miles, or 13 percent of assessed stream miles, including waters with violations of standards for both fecal coliform bacteria and metals). Both fecal coliform and metals violations are most often attributed to "urban runoff" as a primary source or one among several sources (195 miles for fecal coliforms, 90 miles for metals), followed by nonpoint sources (125 miles for fecal coliforms, 60 miles for metals). Within some individual stream reaches, other sources may be of greater importance (e.g., WPCP effluent); however, urban runoff and general nonpoint sources represent a basin-wide concern. Further, strong population growth and development pressure in parts of the basin will tend to increase the importance of urban runoff as a stressor of concern. For such widespread concerns, basin-wide management strategies will be needed.

Major water quality and quantity concerns for the Coosa 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 management strategies may be required or implemented in order to achieve water quality standards.

Table 6-I. Summary of Concerns in the Coosa River Basin

	Source of the Stressor by HUC				
Stressors of Concern	**Conasauga River HUC 03150101**	**Coosawattee River HUC 03150102**	**Oostanaula River HUC 03150103**	**Etowah River HUC 03150104**	**Coosa below Rome and Chattooga River HUC 03150105**
Metals	Urban and rural NPS WPCP effluent		Urban and rural NPS WPCP effluent	Urban and rural NPS	Urban and rural NPS WPCP effluent
Fecal Coliform Bacteria	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS
Erosion and Sedimentation	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS	Urban and rural NPS
Dissolved Oxygen				Dam discharge	
Nutrients		point and nonpoint phosphorus load		point and nonpoint phosphorus load	point and nonpoint phosphorus load
Fish Consumption Guidelines	nonpoint mercury	nonpoint mercury	PCBs in sediment	PCBs in sediment, nonpoint mercury	PCBs in sediment
Water Temperature	Impervious surface and loss of riparian canopy cover	Impervious surface and loss of riparian canopy cover	Impervious surface and loss of riparian canopy cover	Impervious surface and loss of riparian canopy cover	Impervious surface and loss of riparian canopy cover
Water Quantity	Future needs - Sufficient flow to ensure water quality below Dalton - Competing demand	Competing demand		Competing demand	Sufficient flow to ensure water quality below Rome
Threatened and Endangered Species	Listed species	Listed species	Listed species	Listed species	Listed species
Flooding			Floodplain management	Floodplain management	Floodplain management
Source Water Protection	Surface water sources in need of protection	Surface water sources in need of protection	Surface water sources in need of protection	Surface water sources in need of protection	Surface water sources in need of protection

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

	Geographic Area				
Use Classification of Waterbody Segments	**Conasauga River HUC 03150101**	**Coosawattee River HUC 03150102**	**Oostanaula River HUC 03150103**	**Etowah River HUC 03150104**	**Coosa below Rome and Chattooga River HUC 03150105**
Fishing (Support for Aquatic Life)	Metals, pH, toxicity		Metals, toxicity	Metals, DO	Metals, chlordane
Fishing (Fish Consumption)	Mercury	Mercury	PCBs	PCBs, mercury	PCBs
Fishing (Secondary Contact Recreation)	Fecal coliform bacteria	Fecal coliform bacteria	Fecal coliform bacteria, mercury	Fecal coliform bacteria	Fecal coliform bacteria
Drinking Water	Fecal coliform bacteria		Fecal coliform bacteria	Fecal coliform bacteria, metals	
Wild and Scenic	Metals				

In the following pages, priority water quality and quantity concerns are presented by Hydrologic Unit. For some water quality and quantity concerns, problem statements are identical for each HUC, others differ between HUCs. Detailed strategies for addressing these concerns are then supplied in Section 7.

Each concern is listed in the form of a "Problem Statement" which summarizes the linkage between stressor sources and water quality impacts. The order in which concerns are listed for each HUC 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 Coosa basin are being addressed as part of the ACT/ACF study, and are summarized in Section 6.3.

6.1.1 Problem Statements

Conasauga River Basin (HUC 03150101)

Metals

The water use classification of fishing or wild/scenic was not fully supported in one Conasauga River mainstem segment and in seven tributary stream segments due to exceedences of the water quality standards for metals. Lead standards were exceeded in the river due to a water pollution control plant discharge; zinc, copper and/or cadmium were exceeded in tributary stream segments due primarily to nonpoint sources in six segments and to a water pollution control plant discharge in one segment.

Fecal Coliform Bacteria

The water use classification of fishing or drinking water was not fully supported in two Conasauga River mainstem segments and two tributary stream segments due to exceedences of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. There are no stream segments listed at this time in this sub-basin as not fully supporting designated water uses due to poor fish communities or sedimentation.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in one tributary stream segment (Swamp Creek) based on fish consumption guidelines due to mercury. The guidelines are for redeye bass.

Thermal Regime in Trout Streams

Development that results in increased impervious surface area, impoundments on tributaries, and loss of riparian canopies within the Conasauga Basin is adversely affecting trout stream thermal regimes.

Protection of Threatened and Endangered Species

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

Water Quantity Demand

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within portions of the Coosa River Basin. There is concern over meeting future needs in the Dalton area (HUC 03150101).

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 insure a high quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

Coosawattee River Basin (HUC 03150102)

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in one Coosawattee River mainstem segment and eight tributary stream segments due to exceedences of the water quality standard for fecal coliform bacteria. Four are attributed to urban nonpoint sources and five to rural nonpoint sources. Excursions of fecal coliform bacteria standards result from a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. There are no stream segments listed at this time in this sub-basin as not fully supporting designated water uses due to poor fish communities or sedimentation.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in one tributary segment (Talking Rock Creek) and in Carters Lake based on fish consumption guidelines due to mercury. The guidelines are for redeye bass in the tributary and walleye in the lake.

Nutrients

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

Thermal Regime in Trout Streams

Development that results in increased impervious surface area, impoundments on tributaries, and loss of riparian canopies within the Coosawattee Basin is adversely affecting trout stream thermal regimes.

Protection of Threatened and Endangered Species

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

Water Quantity Demand

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within the Carters Lake (HUC 03150102) portion of the Coosa River Basin.

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 insure a high quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

Oostanaula River Basin (HUC 03150103)

Metals

The water use classification of fishing was not fully supported in four tributary stream segments due to exceedences of the water quality standards for metals. Lead, copper and/or mercury standards were exceeded in the tributary stream segments due to nonpoint sources in two segments and to a water pollution control plant discharge in two segments.

Fecal Coliform Bacteria

The water use classification of fishing or drinking water was not fully supported in two Oostanaula River mainstem segments and two tributary stream segments due to exceedences of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. There are no stream segments listed at this time in this sub-basin as not fully supporting designated water uses due to poor fish communities or sedimentation.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in the Oostanaula River mainstream based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo and channel catfish.

Thermal Regime in Trout Streams

Development that results in increased impervious surface area, impoundments on tributaries, and loss of riparian canopies within the Oostanaula Basin is adversely affecting trout stream thermal regimes.

Protection of Threatened and Endangered Species

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

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 insure a high quality water supply. All streams with

municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

Flooding and Floodplain Management

Flooding in the Rome area (HUCs 03150103, 03150104, and 03150105) continues to be a major factor associated with property loss in the basin.

Etowah River Basin (HUC 03150104)

Metals

The water use classification of fishing was not fully supported in one Etowah River mainstem segment and in nine tributary stream segments due to exceedences of the water quality standards for metals. Copper standards were exceeded in the river due to nonpoint sources; copper, lead, zinc, and/or cadmium were exceeded in tributary stream segments due primarily to urban runoff.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in three Etowah River mainstem segments and 22 tributary stream segments due to exceedences of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. There are no stream segments listed at this time in this sub-basin as not fully supporting designated water uses due to poor fish communities or sedimentation.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in the Etowah River mainstream above and below Lake Allatoona or in Lake Allatoona based on fish consumption guidelines due to PCBs and mercury in the river segment and PCBs in the lake. The guidelines are for largemouth bass, spotted bass, and smallmouth buffalo in the river and carp, white bass, and largemouth bass in the lake.

Nutrients

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

Low Dissolved Oxygen

The fishing water use classification was not fully supported in the Etowah River between Lake Allatoona and Richland Creek due to dissolved oxygen concentrations less than standards.

Thermal Regime in Trout Streams

Development that results in increased impervious surface area, impoundments on tributaries, and loss of riparian canopies within the Etowah Basin is adversely affecting trout stream thermal regimes.

Protection of Threatened and Endangered Species

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

Water Quantity Demand

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within the Lake Allatoona portion of the Coosa River Basin.

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 insure a high quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

Flooding and Floodplain Management

Flooding in the Rome area (HUCs 03150103, 03150104, and 03150105) continues to be a major factor associated with property loss in the basin.

Coosa River below Rome and the Chattooga River Basin (HUC 03150105)

Metals

The water use classification of fishing was not fully supported in one Coosa River mainstem segment and in one Chattooga River mainstem segment due to exceedences of the water quality standards for metals. Lead standards were exceeded in the Coosa River due to urban runoff; copper and lead were exceeded in the Chattooga River due to a water pollution control plant discharge.

Fecal Coliform Bacteria

The water use classification of fishing was not fully supported in two Coosa River mainstem segments, two Chattooga River mainstem segments and in four tributary stream segments due to exceedences of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. There are no stream segments listed at this time in this sub-basin as not fully supporting designated water uses due to poor fish communities or sedimentation.

Fish Consumption Guidelines

The water use classification of fishing was not fully supported in the Coosa River mainstem based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo, black crappie, striped bass, and channel catfish.

Nutrients

The water use classifications for fishing, drinking water, and recreation are potentially threatened in Lake Weiss in Alabama due to inputs of nutrients which may

cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

Thermal Regime in Trout Streams

Development that results in increased impervious surface area, impoundments on tributaries, and loss of riparian canopies within the Coosa basin is adversely affecting trout stream thermal regimes.

Protection of Threatened and Endangered Species

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

Water Quantity Demand

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within all portions of the Coosa River basin. There is concern about sufficient quantity of water below Rome (HUC 03150105) to assure water quality in the Coosa River and in Lake Weiss.

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 insure a high quality water supply. All streams with municipal water intakes need to have watershed assessments and protection plans developed, and implemented.

Flooding and Floodplain Management

Flooding in the Rome area (HUCs 03150103, 03150104, and 03150105) continues to be a major factor associated with property loss in the basin.

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 in the Coosa River basin. 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

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 which showed 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.

can be obtained from available resources. 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 Dalton and Rome 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 and discussed in the report, *Water Quality in Georgia, 1996-1997*.

Assigning Priorities for Stream Segments

For many waters in the Coosa 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 the 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, and are the highest priority waters, as these segments will continue to require resources to complete actions and ensure standards are achieved. These stream segments have been assigned priority one.

Second priority was allocated to segments with multiple data points which showed metals concentrations from nonpoint sources in excess of water quality standards and to segments in which dissolved oxygen concentration was an issue.

Third priority was assigned to waters where urban runoff and general nonpoint sources 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 loadings.

Several issues helped forge the rationale for priorities. First, strategies are currently in place to address the significant water quality problems in the Coosa 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 Coosa 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 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.

6.3 Priorities for Water Quantity Concerns

Section 5 also identified a number of concerns for water quantity in the Coosa 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, the 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., industrial, recreation, hydropower, navigation, and environment) can not be met under conditions of water shortage, efforts will be made to optimize the mix of economic and environmental values.

While 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 ACT Interstate Compact, which has been drafted by the states and federal government, does not give the Compact Commission the authority 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 EPD. Of course, the larger Georgia's share of the available water resource in these basins, the less often any single demand will go unmet.

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 Coosa 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) if the manner in which the sources are currently operated is not modified. New sources will have to be identified and developed. As the population of county and sub-county political jurisdictions in the Coosa 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 available regional sources in the Coosa basin will also likely be found to have real limits in providing the water resources to meet portions of the expected increases in water demand. Economic growth may be limited by the capabilities of existing local and regional water resources. An alternative strategy is to form cooperative efforts among adjoining political jurisdictions to plan and construct larger water resources projects. This type of approach would minimize the number of smaller water resources projects, and encourage development of new regional water resources in a more cost-effective and environmentally sensitive manner. Such an approach will require much more inter-jurisdictional cooperation on water supply issues than has been evident to date. Failure to pursue such increased cooperation might very well result in unacceptable water supply based restrictions on regional growth.

In This Section

- "Big Picture" Overview for the Coosa 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 Coosa River basin.

Georgia's Mission Statement for 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 which emphasize coordinated planning necessary to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality, habitat, and recreation. For the Coosa 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. Section 7.1 describes the big-picture management goals for the Coosa River basin. Section 7.2 describes the general and basinwide implementation strategies most relevant to the Coosa 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 Coosa River Basin

This Coosa 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; 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 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 Coosa 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 Coosa River basin.

7.1.1 Water Quality Overview

As discussed in Section 5, water quality in the Coosa 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 little oxygen and impaired aquatic life. For the most part, local government and industrial wastewaters are properly treated, oxygen levels have returned, and fish have followed.

The primary source of pollution that continues to affect waters of the Coosa River basin results from nonpoint sources. Key types of nonpoint source pollution impairing or threatening water quality in the Coosa River basin include erosion and sedimentation, bacteria from urban and rural nonpoint sources, metals from urban and rural sources, excess nutrient loads to reservoirs, and increases in water temperature resulting from loss of riparian canopy and increased paved surface areas. 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 Coosa 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 Coosa 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 Coosa 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 (TMDLs)**. Where water quality sampling has documented standards violations and ongoing actions are not sufficient to achieve water quality standards in a two 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 non-regulatory tools.
- **Source Water Protection**. Most of the public water supply in the Coosa 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 sub-section 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.

- **Lake Water Quality Standards**. The Coosa River basin contains three major reservoirs: Lake Allatoona and Carters Lake in Georgia, and Lake Weiss in Alabama. Georgia has adopted site-specific standards for three lakes in other basins in accordance with state law which requires comprehensive assessments and standards be established for major, publicly owned lakes in Georgia. Comprehensive studies of Lakes Allatoona, Carters, and Weiss are ongoing based on EPA Clean Lakes funding. Georgia will initiate the standards setting process for Lakes Allatoona and Carters following completion and approval of the Clean Lakes studies.
- **Fish Consumption Guidelines**. EPD and the Wildlife Resources Division work to protect public human 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 Coosa River basin is a mixture of livestock and poultry operations and commodity production. About 15 percent of the basin land area is in agricultural use. 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. 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 Coosa basin and forest lands represent over 75 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.

Additional requirements are imposed within the extensive National Forest areas of the Coosa basin. Each National Forest produces and regularly updates a Land and Resource Management Plan to guide timber harvesting and other activities. These plans establish long range goals and objectives, specific management practices and the vicinity in which they will occur, standards and guidelines on how management practices will be applied, and monitoring procedures to assure the Plan is followed.

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.

7.1.2 Water Quantity Overview

In addition to protecting water quality, it is essential to plan for water supply in the Coosa River basin. The Georgia EPD 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 to 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, and regulation of dams for compliance with the Safe Dams Act.

At this time, water quantity appears to be adequate for all uses within the Georgia portion of the basin (Section 5.1), and there are no major new water supply projects proposed. There are, however, several water quantity concerns in the Coosa basin which are of significance to decision makers.

One of the major water quantity concerns in the Coosa River basin is the fairly rapid growth being experienced in the counties near Lake Allatoona (i.e., Cherokee, Bartow, Forsyth and Cobb), and the corresponding additional water needs. This growth is expected to accelerate somewhat as the metropolitan Atlanta region begins to have more of a synergistic effect on each other. Since Cobb County is divided between the Coosa and Chattahoochee River basins, many parts of south Cobb receive water from the Coosa basin. As Marietta grows it will take more water from Lake Allatoona thus increasing transfer of water out of the Coosa basin.

In the Dalton–Whitfield area of the basin, the carpet textile industry is forecasted to grow and to demand additional water resources.

Water resources within the political boundaries of individual counties in the region may not be sufficient to meet longer-term "in-county" needs; therefore, regional cooperation to develop water supply options will become ever more important to support growth in the region. Interbasin diversion of water to meet the growing needs in the region is another option that will likely get more attention.

Interbasin diversions are not prohibited within Georgia, however 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 impacted by such transfers;
2. Issue a press release which describes the proposed transfer; and
3. If the public interest which is expressed in reaction to the press release is sufficient to warrant a public hearing, EPD will hold a hearing to receive comments on the proposed transfer prior to making a final decision.

ACT/ACF Allocations

Water quantity within the Coosa 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- Coosa-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 Coosa basin in Georgia. It is expected that the allocation will establish some form of operation for Lake Allatoona and Carters, including 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. However, it is possible that there may be limitations on quantities of water which will be available for various uses in the Coosa basin.

Sources of water supply to meet the long-term needs of the Dalton area have not been decided at this time. Further allocations by the COE of water supply storage within both Carters Lake and Lake Allatoona are uncertain until the ACT/ACF Comprehensive Study is completed and reallocation formulas are agreed upon. Because of the high proportion of industrial uses in the Coosa basin, this constraint causes local governments within the Coosa basin to be concerned about losing the stability and possible growth associated with their cooperation with industry.

In cases where there is competition for water across water use categories (i.e., water held in lakes for recreation vs. withdrawal for potable uses), Georgia law requires that priority be given to water for human consumption. However, it is far more likely that the competition will not be across water use categories as much as there will be competition for scarce water between adjoining jurisdictions. In such instances, EPD presently does (and will continue to) encourage cooperative efforts to develop and effectively utilize

limited water resources. While 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

There are many statewide programs and strategies that play an important role in the maintenance and protection of water quality in the Coosa basin. These general strategies are applicable throughout the basin to address both point and nonpoint source controls.

7.2.1 General Surface Water Protection Strategies

Antidegradation

The State of Georgia considers all waters of the state as high quality 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 C.F.R. 131.12, will be achieved before lowering of water quality is allowed for high quality water.

The antidegradation review process is triggered at such time as a new or expanded point source discharge is proposed that may have some effect on surface water quality. 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 only be considered 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 shall be maintained and protected.

Water Supply Watershed Protection Strategy

As population continues to increase within the Coosa 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" which define, among other things, measures that local governments are encouraged to take to protect drinking water sources. The "guidelines" are entitled Rules for Environmental Planning Criteria, and establish environmental protection criteria for five environmental categories: water supply watersheds, groundwater recharge areas,

mountains, river corridors and wetlands. The *Criteria for Watershed Protection* (a sub-section 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 upon 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 seven (7) mile radius of the intake and 50/75 feet outside the seven (7) mile radius; and
- A reservoir management plan (including 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) shall have no specified minimum criteria; and
- An intake with a water supply reservoir shall have a minimum of 100 feet natural buffer within a seven 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 (DWP) 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 upon EPD's other assessment and prevention programs, including the Well Head Protection Program, the Vulnerability Assessment and Waiver Program and the River Basin Management Plans, by soliciting active public participation from the local communities and 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, or total maximum daily load, 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 the EPA in February 1998. The EPA reviewed the

Georgia submittal and provided comments in March 1998. Georgia submitted a final 303(d) listing to the 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 Coosa 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 may 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 Coosa River will be addressed in the second round of basin planning. The second round of basin planning for the Coosa River will begin in 2000 and the 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 discharges. Permitted discharges of treated wastewater are managed via 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 only be considered 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 shall 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) toxic pollutants identified with point source discharges. Permits associated with identified problems will be evaluated to determine if a reopening of the permit is appropriate to adequately address the problem.

Watershed Assessment Requirements

A watershed assessment is generally 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 a 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 towards assuring 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.) impact 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 the 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 ten years, various upgrades and improvements have been made to industrial and municipal treatment systems throughout the Coosa 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 that are 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 National Pollution Discharge Elimination System (NPDES) and meet all the requirements of that system. In Georgia, with very few exceptions, surface discharge permits will only be issued 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 as this is deemed to be an operationally achievable number even if a facility does not have dechlorination equipment installed. Facilities which are given a limitation more stringent than 0.5 mg/l which do not already have dechlorination equipment installed, are given up to a two year schedule in which to meet the limitation. All discharging facilities which 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 be 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 is assessed in accordance with the Georgia Rules and Regulations for Water Quality Control. The results of the assessment can be used to trigger either 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 shall be free from material related to discharges which 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. For instance, allowable phosphorus loading to West Point Lake (Chattahoochee basin) is specified in regulation to prevent undesirable eutrophication of that waterbody. Point source control of phosphorus typically involves stringent limits on phosphorus concentrations in municipal NPDES facility effluents. There are ongoing Clean Lakes Phase I studies for Carters Lake and Lake Allatoona in Georgia and Lake Weiss, which receives inflow from the Georgia portion of the Coosa River. These Clean Lakes studies will assess the need for phosphorus control strategies within some or all of the Coosa River basin.

Temperature

Permits issued for facilities which discharge to primary trout streams are required to have no elevation of natural stream temperatures. Permits issued for facilities which 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 discharges, with primary focus on runoff from industrial operations and large urban areas. The EPA promulgated Storm Water Regulations on November 16, 1990. EPD subsequently received delegation from the EPA in January 1991 to issue General Permits and regulate storm water in Georgia. EPD has developed and implemented a strategy which assures 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 which they own or operate, and incorporate detailed storm water management programs. These programs may include such measures as structural and non-structural 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 Rule addresses only municipalities with populations greater than 100,000 people and construction sites larger than five acres. EPA is proposing a Phase II Rule for municipalities with populations less 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 impact 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 eleventh 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 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 which 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

The Georgia Environmental Protection Division (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 loading: 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 non-regulatory approach. This approach uses cooperative partnerships with various agencies and a variety of programs. A brief description of these agencies and outline of their functions and programs is provided below.

Soil and Water Conservation Districts (SWCDs)

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 best management practices (BMPs).

Currently there are forty active SWCDs in Georgia, four of which contain area within the Coosa River basin: Cobb County Soil and Water Conservation District, Coosa River Soil and Water Conservation District, Limestone Valley Soil and Water Conservation District, and Upper Chattahoochee Soil and Water Conservation District.

At the county level, each SWCD receives technical assistance, via an existing Memorandum of Agreement, from the United States 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 GSWCC was also formed in 1937 to support the SWCDs. GSWCC has been designated as the administering or lead agency for agricultural nonpoint source (NPS) pollution prevention in the state. The GSWCC develops NPS 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 provide education and oversight for the Georgia Erosion and Sedimentation Act.

There are a number of other agricultural agencies administering 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. Georgia's 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 groundwater. 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 it's individual members regularly applies for, and receives, funds under section 319(h) of the Clean Water Act to 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 serve to address resource concerns related to agricultural land uses in a coordinated fashion over the next five 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 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, comprised 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 to10 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, two of which are located in the Coosa 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 there are three major conservation programs from USDA that 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. Also, 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 which recommended a voluntary approach to the implementation of best management practices (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 best management practices.

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, 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 BMP 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 state water quality or federal wetlands requirement violations.

Additional requirements are imposed within the National Forest areas of Georgia. Each National Forest produces and regularly updates and Land and Resource Management Plan to guide timber harvest and other activities. These plans establish long range goals and objectives; specific management prescriptions and the vicinity in which they will occur; standards and guidelines on how management prescriptions will be applied; and monitoring procedures to assure the Plan is followed.

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 water bodies. The first is the division between 1) statutory responsibilities for management of water quality, granted to EPD, and 2) local government's Constitutional responsibility for management of the land activities which affect urban water bodies. The second impediment is the widespread nature of the nonpoint sources and the variety of activities which may 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 is responsible for administering and enforcing a variety of permit programs, including permitting of 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 non-point 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 non-regulatory 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 which 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:

- Implement local nonpoint source (NPS) management programs, streambank and stream restoration activities, and community Adopt-A-Stream programs.
- Develop and disseminate local watershed planning and management procedures.
- Implement state and local Erosion and Sedimentation Control Programs.
- Prepare and disseminate technical information on best management practices and nonpoint source monitoring and assessment.
- Implement NPS education programs for grades K through 12 through Project WET (Water Education for Teachers), as described below in Section 7.3.6.

- Implement the Georgia Adopt-A-Stream Program, as described below in Section 7.3.6.
- Identify and evaluate 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 statues are found in Title 44 of the Code of Federal Regulations Parts 59-79. 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 to maintain 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 federal-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 which Governor 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 protects natural and historic resources by acquiring and managing land in the river corridor; Significant Sites, which are tracts of land which DNR will acquire and operate as a traditional state public-use facility: wildlife management or public fishing area, park or historic site, natural area, or greenway; and Restoration Sites, which are tracts of land which 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 state-wide 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 to 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 they become better informed of the values and functions of wetlands. We still suffer 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

While the 1993 Federal Administration Wetlands Plan calls for a concerted effort by EPA and other federal agencies to work cooperatively toward achieving a 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 upon 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 (COE) 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 ten acres above the “headwaters” point of non-tidal streams where the annual average flow is less than 5 cubic feet per second. Enforcement is carried out by the COE and EPA in freshwater wetlands. Normal agricultural and silvicultural operations are exempted under Section 404 regulations.

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

Land Acquisition

The Department of Natural Resources (DNR), 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.

Beginning in 1990 Governor Zell 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/Stewardship Strategies

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

Georgia has chosen a two-pronged approach to encourage stewardship via 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, lays the groundwork for behavior change and is often an important pre-requisite for effective implementation of BMPs and comprehensive watershed management programs.

General goals for stakeholder involvement and stewardship strategies are:

- Generate local support for nonpoint source management through public involvement and monitoring of streams and other water bodies and of results of management actions.
- Increase individual's awareness of how they contribute to nonpoint source pollution problems and implement appropriate strategies to motivate behavior 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 clean-ups, 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 clean ups.

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 NPS pollution (especially, where land use is largely agricultural crop production). Examples of agricultural NPS pollution are presented in workshops, videos and manuals (e.g., excess fertilizer and animal waste). In north Georgia, the focus is generally silvicultural NPS pollution (especially, in areas adjacent to the Chattahoochee and Oconee National Forests). Adopt-A-Stream Programs in urban areas address construction and urban runoff NPS pollution. Workshops and training sessions emphasize the connection between land use, 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 an education and action component on a local stream. Volunteers commit for a minimum of one 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 clean-ups, and 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 either 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. An "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 bi-monthly 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 over 1000 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, there were 30 active Adopt-a-Stream groups in the Coosa basin. These groups and contacts are listed in Appendix F.

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 plan 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-12. As described above, EPD is currently targeting initial nonpoint education activities toward educators and students in grades K-12. To reach this target audience, EPD has focused on implementing Project WET, a water resources education curriculum which focuses on nonpoint pollution. Covering impacts on groundwater and on 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 will address this gap, providing educators and students in grades K-12 with an understanding of the problems caused by nonpoint source pollution and of 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 over 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 three years, it is expected that a cooperating agency will assume responsibility for on-going Project WET activities. At that time, the focus of the state's NPS education activities will be re-evaluated and, depending on the focus of education efforts undertaken by other entities, another of the audiences identified in the 1994 education plan may 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 U.S. EPA 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 anti-degradation 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 clean-up ground water in the unlikely event pollution were to occur. 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 in 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 the State's Department of Natural Resources) which 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/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 and/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 clean-up 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.

Additionally, 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 by the Department of Community Affairs; and on-site sewage disposal, by the Department of Human Resources. EPD has established formal Memoranda of Understanding (MOU) with these agencies. The Georgia Groundwater Protection Coordinating Committee was established in 1992 to coordinate groundwater 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 that are targeted to address the concerns and priority issues for the Coosa 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 identified concerns, 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 may simply consist of increased monitoring; in other situations, the stakeholders in the subbasin will need to develop innovative solutions to these water quality issues. While 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 Coosa River basin.

7.3.1 Metals

Problem Statement

Water use classifications were not fully supported in several water body segments due to exceedances of the water quality standards for metals. These water quality exceedances are found in a number of stream segments in the Coosa River basin and are primarily attributed to nonpoint sources, both rural and urban (for a complete listing of affected stream segments see Appendix E). A common strategy is proposed for addressing metals throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Conasauga River (Hydrologic Unit 03150101)

The water use classification of fishing or wild/scenic was not fully supported in one Conasauga River mainstem segment and in seven tributary stream segments due to exceedances of the water quality standards for metals. Lead standards were exceeded in the river due to a water pollution control plant discharge; zinc, copper and/or cadmium

were exceeded in tributary stream segments due primarily to nonpoint sources in six segments and to a water pollution control plant discharge in one segment.

Oostanaula River (Hydrologic Unit 03150103)

The water use classification of fishing was not fully supported in four tributary stream segments due to exceedances of the water quality standards for metals. Lead, copper and/or mercury standards were exceeded in the tributary stream segments due to nonpoint sources in two segments and to a water pollution control plant discharge in two segments.

Etowah River (Hydrologic Unit 03150104)

The water use classification of fishing was not fully supported in one Etowah River mainstem segment and in nine tributary stream segments due to exceedances of the water quality standards for metals. Copper standards were exceeded in the river due to nonpoint sources; copper, lead, zinc, and/or cadmium were exceeded in tributary stream segments due primarily to urban runoff.

Coosa River below Rome; Chattooga River (Hydrologic Unit 03150105)

The water use classification of fishing was not fully supported in one Coosa River mainstem segment and in one Chattooga River mainstem segment due to exceedances of the water quality standards for metals. Lead standards were exceeded in the Coosa River due to urban runoff; copper and lead were exceeded in the Chattooga River due to a water pollution control plant discharge.

General Goals

Meet water quality standards to support designated water uses.

Ongoing Efforts

The primary contributor of metals to streams are nonpoint sources. In cases where a water pollution control plant was the likely cause of the elevated metals concentration, EPD has taken enforcement action through the NPDES permitting process to require compliance with NPDES permit limits for metals.

Identified Gaps and Needs

The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, 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, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if 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 may 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 may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action

Addressing metals from nonpoint sources will be a complex task. An initial task will be to conduct additional monitoring to document if water quality standards are actually being exceeded.

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.
- Other participants would be identified contingent on further analysis to confirm metal concentrations and on identification of potential sources.

Specific Management Objectives

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

Management Option Evaluation

EPD will take the lead in conducting additional monitoring to confirm if water quality standards are being exceeded. If violations are documented, EPD will develop a plan to assess sources and identify alternative solutions.

Action Plan

- EPD will complete a review of existing metals data in listed segments by September 2000, in accordance with the statewide 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 Bio-assessment 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 re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2002.

Methods for Tracking Performance

Progress in management of urban and industrial storm water will be tracked through ongoing sampling efforts and by possible biological monitoring studies. An evaluation of the status of listed water bodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa basin in 2002.

7.3.2 Fecal Coliform Bacteria

Problem Statement

Water use classifications for fishing or drinking water were not fully supported in several water body segments due to excursions of the water quality standards for fecal coliform bacteria. These water quality excursions are found in a number of stream segments in the Coosa River basin and are primarily attributed to nonpoint sources, both rural and urban. A common strategy is proposed for addressing fecal coliform bacteria throughout the basin. However, achieving standards in individual stream segments will depend on the development of site-specific local management plans.

Conasauga River (HUC 03150101)

The water use classification of fishing or drinking water was not fully supported in two Conasauga River mainstem segments and two tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Coosawattee River (HUC 03150102)

The water use classification of fishing was not fully supported in one Coosawattee River mainstem segment and eight tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. Four are attributed to urban nonpoint sources and five to rural nonpoint sources. Excursions of fecal coliform bacteria standards result from a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Oostanaula River (HUC 03150103)

The water use classification of fishing or drinking water was not fully supported in two Oostanaula River mainstem segments and two tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Etowah River (HUC 03150104)

The water use classification of fishing was not fully supported in three Etowah River mainstem segments and 22 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

Coosa River below Rome and Chattooga River (HUC 03150105)

The water use classification of fishing was not fully supported in two Coosa River mainstem segments, two Chattooga River mainstem segments and in four tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes.

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 Coosa River basin is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows may 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 implementations. Sustainable Agriculture and Farm*A*Syst. Training will be scheduled in the near future within the basin. The UGA and ARS have proposals in for assessing nutrient and coliform reducing BMPs on 10 farms that will have statewide implications. 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.

Within the Conasauga basin, there is an ongoing NRCS, RC&D, and Conservation District natural resources assessment within the basin as well as the Conasauga Alliance effort. These efforts mostly deal with reducing sediment and pollutants associated with animal waste. 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 may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows may be a source of fecal coliforms. 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 may be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if 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 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 for 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 five year phase of the basin

management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-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 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 regulations, zoning and land use planning, implement local watershed initiatives, and monitoring programs.
- Local municipalities should work with the 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 program and encourage local planning to address 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 and complete sampling 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. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa 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, regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of agricultural best 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 work with local governments in implementing watershed initiatives.
- Local municipalities should work with the local health departments to identify locations of septic systems and educate owners about the 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 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 utilize 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. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa 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 water body segments 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, stream erosion (including headcutting, bank erosion, and shifting of the bedload), forestry practices, and agriculture. Threats from sediment load are possible throughout the Coosa River basin, although there are no stream segments listed at this time in the basin as not fully supporting designated water uses due to sedimentation. 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.

Conasauga River (HUC 03150101)

GSWCC estimates that there are 43,600 agricultural acres within HUC 03150101 and that 15,150 of those acres are eroding above the soil loss tolerance. The Conasauga basin was selected as a 1997 USDA-EQIP priority area and allocated $111,700 targeted for livestock concerns. The basin is also a number 2 priority area for the 1998 USDA-EQIP program. There is a Conasauga River Alliance between the Limestone Valley Resource Conservation Council, The Nature Conservancy, UGA, NRCS, and the Tennessee Aquarium. This project promotes the installation and use of agricultural BMPs in the upper part of the basin with the stated goal of protecting and preserving the aquatic diversity of the Conasauga River above Highway 76 in Georgia and Tennessee. Through these unique partnerships agricultural producers and other landowners are developing riparian buffers that serve as nonpoint source pollutant filters to help maintain and improve the water quality in the Conasauga, and create additional habitat for wildlife.

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 357 acres in the Conasauga basin and determined that, of the activities, 89 percent of the roads and 99 percent of the harvested acres were in compliance with BMPs. No site prepared acres or regenerated acres were evaluated.

Coosawattee River (HUC 03150102)

GSWCC estimates that there are 84,800 agricultural acres within HUC 03150102 and that 18,400 of those acres are eroding above the soil loss tolerance. The Coosawattee basin was selected as a 1997 USDA-EQIP priority area and allocated $127,000 mostly targeted for livestock concerns. NRCS, the Coosa River Soil and Water Conservation District, and the Limestone Valley District are also conducting a model farm demonstration in Gilmer County. This demonstration focuses on practices that promote livestock production efficiency and BMP installation, operation, and maintenance.

During the 1992 survey, the GFC evaluated 260 acres in the Coosawattee basin and determined that, of the activities, 72 percent of the roads, 96 percent of the harvested acres, and 98 percent of the site prepared acres were in compliance with BMPs. No regenerated acres were evaluated.

Oostanaula River (HUC 03150103)

GSWCC estimates that there are 90,900 agricultural acres within HUC 03150103 and that 17,800 of those acres are eroding above the soil loss tolerance. Grazing land training and livestock BMP demonstrations are being conducted at Berry College in cooperation with CES, NRCS, GSWCC, and the Coosa River Soil and Water Conservation District through a Section 319 Grant. In this project, the principles of grazing land management are being displayed, including rotational grazing, forage management, and other practices that increase the health and vigor of a cattle herd and the forage they consume. The basin has also been selected as a USDA-EQIP 1997 priority area and allocated $80,000 targeted mostly for livestock concerns.

During the 1992 survey, the GFC evaluated 336 acres in the Oostanaula basin and determined that, of the activities, 91 percent of the roads and 98 percent of the harvested acres were in compliance with BMPs. No site prepared acres or regenerated acres were evaluated.

Etowah River (HUC 03150104)

GSWCC estimates that there are 212,800 agricultural acres within HUC 03150104 and that 36,150 of those acres are eroding above the soil loss tolerance. The basin has been selected as a USDA-EQIP 1997 priority area and allocated $96,100 targeted for livestock concerns.

During the 1992 survey, the GFC evaluated 1,161 acres in the Etowah basin and determined that, of the activities, 89 percent of the roads, 95 percent of the harvested acres, 69 percent of the site prepared acres, and 100 percent of the regenerated acres were in compliance with BMPs.

Coosa River below Rome and Chattooga River (HUC 03150105)

GSWCC estimates that there are 86,000 agricultural acres within HUC 03150105 and that 18,500 of those acres are eroding above the soil loss tolerance. Coosa River basin has been selected as a 1997 USDA-EQIP priority area with $79,000 targeted for livestock concerns and the Armuchee Creek Watershed has been selected as a number 2 priority for 1998 USDA-EQIP funding. Also there is a NW Georgia Coalition working with rural water quality issues in the Basin.

During the 1992 survey, the GFC evaluated 305 acres in the Coosa/Chattooga basin and determined that, of the activities, 54 percent of the roads, 92 percent of the harvested acres, and 98 percent of the site prepared acres were in compliance with BMPs. No regenerated acres were evaluated.

General Goals

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

Ongoing Efforts

Forestry and Agriculture have voluntary 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 the *Manual for Erosion and Sediment Control in Georgia* and the *Field Manual for Erosion and Sediment*

Control in Georgia. The GSWCC with 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 through out the State. 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.

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 Georgia Forestry Association's and the American Forest and Paper Association's (AF&PA) sponsored Master Timber Harvesters Workshop. It is that group's goal 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 cause additional sedimentation reductions and leave more riparian tree cover over perennial and intermittent streams when they become standard within the industry.

EPD serves as an "Issuing Authority" in those localities across the State that do not have a local Erosion and Sedimentation Control Ordinance or Program. EPD provides permitting, inspection, compliance, and enforcement services in these areas.

There are several urban focused erosion educational initiatives underway. Each year GSWCC and EPD conduct 5 formal E&SC courses to provide training to the regulated community, regulators, consultants, and interested citizens. GSWCC also provides detailed E&SC training for 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.

Large portions of HUCs 03150101, 03150102, and 03150103 are managed by the US Forest Service as part of the Chattahoochee National Forest. Management of the National Forest is prescribed in a Land and Resource Management Plan, which specifies the standards and guidelines and appropriate timing and vicinity of allowed practices. Five management areas are of particular significance to the Coosa River basin:

- Management Area 1: Wilderness areas, including the 35,233 acre Cohutta Wilderness Area. The management goals are to "Preserve the areas wilderness character and manage for future use and enjoyment as wilderness". Timber harvest and road construction is not allowed in these areas except under emergency conditions.
- Management Area 11: Major recreation areas and adjoining lands dominated by riparian vegetation. The management goals are to manage these areas in a near-natural condition for their value to wildlife, recreation, fishery, aquatic habitat, and water quality, while emphasizing the protection or enhancement of the major recreation trout streams, the adjoining lands, and associated vegetation. Timber harvesting is permitted, but with an objective of protecting riparian and recreation values.
- Management Area 12: Major lakes, vistas, and seen areas. The management goal is to maintain a visually appealing landscape. Timber harvesting is permitted, but clearcutting is subject to strict limitations.

- Management Area 15: Non-motorized recreational areas which have a goal of maintaining a setting characterized by a predominantly natural or natural-appearing environment. Timber harvesting is permitted, but clearcutting is discouraged and no more than 10 percent of each geographical component of the management area will be clearcuts in the 0 to 10 year age class.
- Management Area 16: The general forest area, which contains the majority of the National Forest and is managed in compliance with the Multiple-Use Sustained Yield Act of 1960. While the primary focus is on renewable resource production, special protection is provided for protection of unique and delicate resources. General prescriptions for road and skid trail construction and maintenance, vegetation management, timbering and reforestation, watershed improvement, and erosion protection apply.

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 IBI (Index of Biotic Integrity) 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 highly impacted streams cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD partners and other stakeholders.

Many privately owned sawmills are not members of the AF&PA 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 the Southeastern Wood Producers Association are working on a solution. There is still a need for education of private landowners who are selling timber for the last time prior to land development. Many such landowners attempt to maximize return on timber, sometimes at the expense of BMPs.

Much of the sediment being produced and adversely impacting streams and lakes is associated with road development and maintenance. In many instances E&SC plans, implementation, inspection and enforcement are not adequate on DOT 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 may be needed to quantify the impact of unpaved rural roads as a source of sedimentation into streams.

Strategies for Action

Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted 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. Local SWCDs will convene Local Work Groups to identify local resource concerns and develop proposals for funding to address these concerns.
- GFC will encourage implementation of forestry BMPs.
- 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 in order to meet narrative 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.
- 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 sites, 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 biennial surveys; and EPD through routine inspections of permitted projects, 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 Fish Consumption Guidelines

Conasauga River Basin (HUC 03150101)

Problem Statement

The water use classification of fishing was not fully supported in one tributary stream segment (Swamp Creek) based on fish consumption guidelines due to mercury. The guidelines are for redeye bass.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish and issued fish consumption guidelines. There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

The source of mercury is not well quantified. Mercury within Swamp Creek is likely derived from natural sources or from atmospheric deposition.

Strategies for Action

Because the load mercury is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by 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.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of Mercury during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Coosawattee River Basin (HUC 03150102)

Problem Statement

The water use classification of fishing was not fully supported in one tributary segment (Talking Rock Creek) and in Carters Lake based on fish consumption guidelines due to mercury. The guidelines are for redeye bass in the tributary and walleye in the lake.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in Carters Lake and issued fish consumption guidelines. There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

The source of mercury is not well quantified. Mercury within Carters Lake is likely derived from natural sources or from atmospheric deposition.

Strategies for Action

Because the load mercury is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate

Specific Management Objectives

EPD and WRD will work to protect public human health by 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.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of Mercury during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Oostanaula River Basin (HUC 03150103)

Problem Statement

The water use classification of fishing was not fully supported in the Oostanaula River mainstream based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo and channel catfish.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Oostanaula River and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized.

Strategies for Action

Because the load of PCBs is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by 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.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.
- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Etowah River Basin (HUC 03150104)

Problem Statement

The water use classification of fishing was not fully supported in the Etowah River mainstream above and below Lake Allatoona or in Lake Allatoona based on fish consumption guidelines due to PCBs and mercury in the river segment and PCBs in the lake. The guidelines are for largemouth bass, spotted bass, and smallmouth buffalo in the river and carp, white bass, and largemouth bass in the lake.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Etowah River mainstream and in Lake Allatoona and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

There are no known point source discharges of mercury in the watershed. However, mercury is a naturally occurring metal that recycles between land, water and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of the mercury absorbed will be returned to the environment but some will remain in plant and animal tissues. Mercury may also be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the elevated mercury level is related to global atmospheric transport.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized. The source of mercury is not well quantified.

Strategies for Action

Because the load of PCBs is not originating from any known point sources and the mercury within the Etowah River and Lake Allatoona is likely derived from natural sources or from atmospheric deposition, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by 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.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for

this reach will be considered in 2002 in accordance with the river basin monitoring cycle.

- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

Coosa River below Rome and Chattooga River Basin (HUC 03150105)

Problem Statement

The water use classification of fishing was not fully supported in the Coosa River mainstem based on fish consumption guidelines due to PCBs. The guidelines are for largemouth bass, smallmouth buffalo, black crappie, striped bass, and channel catfish.

General Goals

Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts

DNR has monitored fish in the Etowah River mainstream and issued fish consumption guidelines. The source of PCBs within the watershed is thought to have originated from the General Electric facility in Rome. Cleanup operations from the General Electric facility in Rome were completed in 1980.

Identified Gaps and Needs

Although they were banned in 1976, PCBs do not break down easily and remain in sediment for years. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were regularly used as fluids for electrical transformers, cutting oils, and carbonless paper. Residual contamination in sediment presumably drives fish body burdens, but the cycling of PCBs in the river is not fully characterized. The source of mercury is not well quantified.

Strategies for Action

Because the load of PCBs is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles

- EPD and WRD to sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives

EPD and WRD will work to protect public human health by 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.

Action Plan

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2002 in accordance with the river basin monitoring cycle.

- EPD will evaluate the need for additional sampling (*e.g.*, sediment sampling) to determine sources of PCBs during the next iteration of the Coosa River basin management cycle.

Method of Tracking Performance

Trends in fish tissue concentration; number of Fish Consumption Guidelines required.

7.3.5 Nutrients

Excess nutrient loads are a concern for all surface waters, as they promote undesirable growths of floating and attached algae which 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 may also stimulate undesirable growths of attached algae in smaller rivers and streams. For this iteration of the Coosa basin plan, nutrients have been identified as a significant issue in three HUCs due to loading of nutrients to reservoirs. These nutrients derive from the entire watershed upstream, and protection of water quality will require basinwide strategies to control nutrient loads.

Coosawattee River (HUC 03150102)

Problem Statement

The water use classifications of fishing and recreation are potentially threatened in Carters Lake due to inputs of nutrients which may 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 Carters Lake.

Ongoing Efforts

EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which may be used to develop specific lake water quality standards for Carters Lake. This project was designed as a comprehensive study of Carters Lake and its drainage basin. The Georgia EPD received a grant from the US EPA to conduct the study. Fieldwork for the project was conducted from January 1996 to February 1997. The lake was visited once a month during the colder months and twice a month during the growing season. A total of 7 stations were established for the study: 4 in the lake, 2 below the lake and 1 in the headwaters of the Coosawattee River, the main tributary that feeds into Carters Lake. Data from the seven main tributaries that enter Carters Lake was also collected, once in February, March and November, then twice a month April through October.

Goals of the study were:

- Conduct a year of baseline monitoring and sample collection
- Sample diel dissolved oxygen (DO) in the water column
- Develop a map locating aquatic macrophytes
- Calculate a general nutrient budget from collected data
- Characterize sediments
- Determine priority pollutants in water and fish

- Characterize the watershed for nonpoint source pollutants
- Conduct algal growth potential (AGP) tests
- Determine sediment oxygen demand (SOD) and check pollutants in sediment
- Investigate the effects of "pumpback" by the dam

Lake water samples were analyzed for: Total Phosphorus, Nitrite + Nitrate, Ammonia, TKN, BOD_5, Fecal Coliform, total reactive phosphorus, pH, Alkalinity, Hardness, Conductivity and Chlorophyll *a*. In situ measurement include: Vertical profiles for dissolved oxygen (DO), water temperature, pH, conductivity, water clarity, and air temperature, as well as wind speed and direction. The same parameters were applied to the tributary sampling, adding flow measurement.

The fieldwork has been completed. The report is currently in progress. An initial draft is expected June of this year, with the final report ready by Fall.

The data collected indicates that Carters Lake is a very clean body of water. There is only one point source discharge into the basin, which is the municipal treatment facility in Ellijay, Georgia. Fecal coliform bacteria densities in the Coosawattee River just below Ellijay were slightly elevated in a few samples, but no high counts were found in the lake. Areas of potential concern were all of nonpoint source issues: sedimentation and nutrient level elevation from runoff, especially in the areas draining into the Coosawattee River. Tributary data showed that Flat Creek had elevated levels of bacteria, possibly from septic tank drainage and livestock pen runoff. Talking Rock Creek had some high readings in pH and conductivity, possibly from the weeds that choked off the stream in late summer. Tails Creek had a very high turbidity reading from one sample, possibly from land disturbing activities in the headwaters.

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 watersheds surrounding Carters Lake to minimize nutrient inputs into the lake and comply with future water quality standards.

Etowah River (HUC 03150104)

Problem Statement

The water use classifications of fishing, drinking water, and recreation are potentially threatened in Lake Allatoona due to inputs of nutrients which may 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 Lake Allatoona.

Ongoing Efforts

EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which will be used to develop specific lake water quality standards for Lake Allatoona. EPD's Clean Lakes grant was contracted out to the A. L. Burruss Institute of Public Service at Kennesaw State University in 1992, to conduct a Phase 1 Diagnostic

Feasibility Study of Lake Allatoona. Monitoring was conducted over the 1992 - 1996 period. The emphasis of the study is on the assessment of water quality within the lake and the feasibility of watershed protection. The contract was extended in 1994 for 2 additional years to assist project completion. The study received funding from the environmental partners of Bartow, Cherokee and Cobb Counties, as well as from the City of Cartersville and the Georgia EPD.

A consolidated draft report on the Lake Allatoona Clean Lakes Study was completed in February 1998 (Burruss, 1998). The final report will be completed after a series of public participation meetings are held in April and May 1998, from which comments will be entered into the final report package. Submission of the final completed report is expected in June.

The Clean Lakes Study data for Lake Allatoona documented that the lake is in transition between mesotrophic and eutrophic. Study data indicates that Lake Allatoona is a seriously threatened lake in general, with a few major trouble areas. The Little River arm of the lake is most seriously impacted, followed by Allatoona Creek. The Etowah River is the main contributor of nutrients to the lake, not in terms of high concentration, but rather, because of its volume of flow. Nutrient levels in the lake are elevated, and bacteria levels were elevated at some sites on some visits. The water quality of Lake Allatoona has steadily declined over the past few years. Nonpoint source runoff which includes sediment, nutrients and bacteria, from new and existing development in the drainage basin, is a primary reason for this decline.

Identified Gaps and Needs

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

Strategies for Action

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Lake Allatoona to minimize nutrient inputs into the lake and comply with future water quality standards.

The draft Clean Lakes study (Burruss, 1998) provides 26 action recommendations, which are grouped into nine categories:

1. Watershed Management and Protection, including identification of management goals and formation of a watershed management plan.
2. Nonpoint Source Pollution Prevention Using Best Management Practices (BMPs) to mitigate existing problems and avoid future pollution problems.
3. In-Lake Restoration, using food-web and water level manipulation to help control algal growth.
4. Septic Tank and Point Source Controls and Management, primarily directed towards control of phosphorus loads.
5. Solid Waste Strategies to address loading from existing and potential sanitary waste landfills.
6. Natural Area Preservation, including construction standards, tree preservation, and use of green space and natural buffers.
7. Water Conservation Programs to help control volume of wastewater discharges through reduced water usage.
8. Continued Lake and Watershed Monitoring to periodically assess changes in limnological indicators.

9. Public Participation Program to facilitate public participation, foster volunteer efforts, and provide a basis for local government actions to protect the resource.

Coosa River below Rome and Chattooga River Basin (HUC 03150105)

Problem Statement

The water use classifications of fishing, drinking water, and recreation are potentially threatened in Lake Weiss in Alabama due to inputs of nutrients which may 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 Lake Weiss.

Ongoing Efforts

Alabama DEM is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which will be used to develop specific lake water quality targets for Lake Weiss.

Identified Gaps and Needs

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

Strategies for Action

Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Lake Weiss to minimize nutrient inputs into the lake and comply with future water quality standards.

7.3.6 Low Dissolved Oxygen

Etowah River Basin (HUC 03150104)

Problem Statement

The fishing water use classification was not fully supported in the Etowah River between Lake Allatoona and Richland Creek due to dissolved oxygen concentrations less than standards.

General Goals

Meet water quality standards to support designated water uses.

Strategies for Action

Low dissolved oxygen in the river segment was due to discharges of oxygen-depleted bottom water from Lake Allatoona Dam. The Corps of Engineers will work on the assessment and implementation of feasible actions to maintain acceptable dissolved oxygen concentrations in waters released from the dam.

Key Participants and Roles

- EPD: monitor and assess user support in the listed waters.
- The Corps of Engineers: owns and operates the dam.

Specific Management Objectives

Maintain dissolved oxygen concentrations in the Etowah River adequate to support aquatic life and meet water quality standards.

Management Option Evaluation

The Corps of Engineers will evaluate alternatives for improving the dissolved oxygen concentrations in the releases form the Lake Allatoona Dam.

Action Plan

- The EPD will monitor and assess use support in the listed waters and will work with the Corps to evaluate cost-effective changes in the dam operation to improve dissolved oxygen concentration the releases from Lake Allatoona Dam.
- The Corps of Engineers will evaluate alternatives in the dam operations to improve the dissolved oxygen concentrations in the releases from Lake Allatoona Dam.

Methods for Tracking Performance

A reevaluation of the status of the listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Coosa River basin in 2002.

7.3.7 Thermal Regime in Trout Streams

Problem Statement

Development that results in increased impervious surface area, impoundments on streams, and loss of riparian canopy within the Conasauga, Coosawattee, Oostanaula, Etowah and Coosa basins are adversely affecting trout stream thermal regimes.

General Goals

To meet or exceed local, state and federal laws, rules and regulations, and be consistent with other applicable plans; and to provide for education of the general public on matters involving the environment and ecological concerns specific to each river basin.

Ongoing Efforts

A strategy and regulations are in place for controlling the construction of new impoundments on trout streams. The Rules and Regulations for Water Quality Control, 391-3-6-.03(14)(a) state "No person shall construct an impoundment on Primary Trout Waters, except on streams with drainage basins less than 50 acres upstream of the impoundment. Impoundments on streams with drainage basins less than 50 acres must be approved by the Division. No person shall construct an impoundment on Secondary Trout Waters without the approval of the Division." Applications for such impoundments are reviewed by WRD, which makes recommendations for approval or denial to EPD.

The Georgia Forestry Commission (GFC) is in the process of updating their BMP manual with modification of the guidelines for timber harvest within riparian buffers. These guideline revisions will result in more canopy remaining over streams after timber harvest.

The Georgia Soil and Water Conservation Commission (GSWCC) with its agricultural partners have produced and distributed three pamphlets; *"Guidelines for Streambank Restoration", "A Guide to Controlling Erosion with Vegetation"*, and *"Agricultural Best*

Management Practices". These publications provide recommendations for establishing and maintaining riparian buffer zones, including woody vegetation that shades streams.

The Erosion and Sediment Control (ES&C) Act affords protection to riparian stream buffers on trout streams throughout the state by providing for a 100 foot stream buffer. Under this Act, only the Director of EPD has the authority to issue variances for land disturbing activities within the riparian buffers of trout streams.

Identified Gaps and Needs

The control of increases in impervious surface area, which can lead to harmful increases in temperature in trout streams, is the responsibility of local jurisdictions, which often lack the expertise to evaluate thermal impacts of development.

Exemptions under the ES&C Act still allow for overhead canopy removal along trout streams. The new GFC BMPs address one of these exemptions and should significantly enhance canopy protection once implemented. Individual landowners need to be educated on the function and importance of riparian buffers and forested canopies along trout streams.

Strategies for Action

The protection of trout stream thermal regimes necessitates consideration of what happens on the land adjacent to the streams as well as in the streams themselves. Commercial, residential, agricultural, and silvicultural uses of the land without consideration of their effects all can lead to degraded thermal conditions for trout.

Partners will enhance forested riparian canopy protection along trout streams through a three point approach: 1) voluntary BMP compliance within the forestry and agriculture community, 2) enforcement of the Erosion and Sediment Control Act and the riparian buffer variance process, and 3) consideration of thermal impacts when approving new impoundments.

Key Participants and Roles

- EPD, GSWCC, NRCS, WRD, GFC, and local land disturbing activity permit issuing authorities will address riparian cover protection.
- EPD and WRD will address permitting of impoundments on trout streams.
- Local planning authorities, with assistance from WRD and EPD, will address thermal impacts of increased impervious surface cover.

Specific Management Objectives

Ensure appropriate thermal regime in Primary and Secondary Trout Streams.

Action Plan

- EPD and WRD will continue to enforce regulations governing approval and construction of impoundments on trout streams.
- EPD will continue to enforce the E&SC Act's riparian buffer requirements and conduct a variance review process with emphasis on protecting forested riparian canopies and on addressing thermal loading due to increased impervious surface area.
- EPD, NRCS, GSWCC and local issuing authorities will assure compliance with the Erosion and Sediment Control Act.

- Local planning and zoning authorities should address potential thermal impacts of increased impervious cover in developments.
- GSWCC and NRCS will work within the agriculture community to increase BMP compliance for riparian buffers.
- GFC will work with the silviculture community to implement the new BMPs designed to protect forested riparian canopies.

Methods for Tracking Performance

GSWCC, NRCS, and GFC will track BMP compliance during this river basin cycle. WRD and EPD will assess status of trout streams.

7.3.8 Protection of Threatened and Endangered Species

Problem Statement

The Coosa basin is home to a number of aquatic species which 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 Coosa River basin was not available at the time of the preparation of this draft plan.

7.3.9 Water Quantity Demand

Problem Statement

Sufficient water quantity to meet the competing demands for drinking water, minimum instream flow rate and other environmental releases, hydropower, and recreation uses may not be available within the area of Lake Allatoona (HUC 03150104), Carters Lake (HUC 03150102), and the other portions of the Coosa River basin. There is concern over meeting future needs in the Dalton area (HUC 03150101). There is also concern about sufficient quantity of water below Rome (HUC 03150105) to assure water quality in the Coosa River and in Lake Weiss.

General Goals

Provide adequate downstream water releases to meet Georgia's priority needs while maintaining pool levels in Allatoona and Carters Lake which provide for recreation opportunities and hydropower production, yet which anticipate potential future water shortages as the highest priority.

Ongoing Efforts

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 modification of the operation of Lake Allatoona and Carters Lake. It may also be necessary to increase the allocation of storage in these reservoirs for drinking water purposes. In addition, there is concern that projections of future water needs in northwest Georgia, particularly in the Dalton area, reflect an under-prediction in the growth of population and the carpet industry.

Identified Gaps and Needs

The models and databases which 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.

Aquatic habitat can be adversely affected by unnatural variations in lake levels and river flow. One significant issue which is receiving 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 multidisciplinary 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 group 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.

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 Coosa basin flows which 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 which falls significantly short of its expected needs in a drought, though there may 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, Mr. Lindsay Thomas, who was 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.
- 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 U.S. Army Corps of Engineers as lead agency, is preparing an Environmental Impact Statement to evaluate the impacts of the chosen allocation formula and management procedures.
- 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 Coosa 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 Coosa River basin must be consistent with the ACT allocation. However, detailed Coosa basin management activities will not be determined by the interstate agreement as local control of water resource decisions will be retained.

Action Plan

- Complete ACT allocation formula by December 31, 1998.
- Federal concurrence (or non concurrence) within 255 days of the allocation formula.
- Following concurrence with the ACT allocation 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.

7.3.10 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 insure 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 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 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. Other local groups (e.g, The Conasauga Alliance) have taken an interest in promoting source water protection in the basin.

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 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 upon 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 and submit to the Environmental Protection Agency a SWAP Implementation Plan 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 make assessments available to the public.

Key Participants and Roles

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

Specific Management Objectives

The EPD is actively working toward the national goal of 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 be updated with each planning cycle in the basin.

Action Plan

- EPD will submit a SWAP Implementation Plan 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.

7.3.II Flooding and Floodplain Management

Problem Statement

Flooding in the Rome area (HUCs 03150103, 03150104, and 03150105) continues to be a major factor associated with property loss in the basin.

General Goals

Increase awareness and knowledge of floodplain management. Enhance the floodplain management capabilities of communities participating in the National Flood Insurance Program (NFIP).

Ongoing Efforts

The EPD will continue to provide workshops, technical assistance, and data to participating communities and other parties involved in floodplain determinations.

Identified Gaps and Needs

Communities participating in the National Flood Insurance Program need to become more aware of the necessity for implementing more stringent floodplain management measures and developing multi-objective management strategies to address issues related to flooding.

Strategies for Action

Develop “action partnerships” with agencies and organizations such as Regional Development Centers (RDCs), Georgia Municipal Associating, and Association of County Commissioners of Georgia to maintain compliance and increase the number of NFIP communities within the basin. Agencies such as the Natural Resources Conservation Service and U.S. Army Corps of Engineers are potential resources for technical data and information.

Key Participants and Roles

- Federal government (FEMA): Identify and map communities flood hazard areas; provide technical assistance to communities; establish insurance rates based on identified risk.
- State government (Floodplain Management Office): Provide guidance and technical assistance to participating communities; evaluate and document communities and state agencies floodplain management capabilities; provide information and training to the private sector.
- Local governments: Administer and enforce local floodplain management regulations in compliance with federal standards; issue or deny development/building permits; notify property owners of flood risk; maintain community flood maps for public inspection; apply for participation in the National Flood Insurance Program.

Specific Management Objectives

- Increase the public and private sectors awareness and understanding of floodplain management.
- Enhance the effectiveness of floodplain management at the state and local level.
- Maintain compliance of participating communities; increase the number of local communities participating in the NFIP.

Action Plan

- The following activities will be implemented by the Georgia Floodplain Management Office:
- Expand the use of information technology to improve the level of awareness regarding floodplain management.
- Continue to establish public and private partnerships to promote understanding of floodplain management.
- Increase opportunities for delivery of floodplain management training and technical workshops.
- Identify target communities for participation in the National Flood Insurance Program (NFIP).
- Identify target communities with the possible capabilities of enacting stronger measures to further reduce flood damages.

Method for Tracking Performance

Participation rates in NFIP; flood damage assessments.

References

Burruss. 1998. Lake Allatoona Phase I Diagnostic-Feasibility Study, Report for 1992-1997 (Draft). Prepared for U.S. EPA, Georgia EPD, Bartow County Government, Cherokee County Water Authority, City of Cartersville, Cobb County Government, and Cobb-Marietta Water Authority. A.L. Burruss Institute of Public Service, Kennesaw State University, Kennesaw, Georgia

GA DNR. 1998. Georgia Rivers: An Initial Assessment. Georgia Department of Natural Resources, Atlanta, GA

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 Coosa 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). Much of these improvements stem from increased wastewater treatment at municipalities and industries, and from implementation of best management practices by landowners 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 existing waters still in need of restoration and attention.

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.

Additionally, continued growth in population is expected in the Coosa 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 for 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 Coosa 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)
- Flood plain 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 but a few of the areas involved, but they serve to 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, i.e., 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 be aware of appropriate partners to work with in addressing 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, River Basin Advisory Committee meetings and Stakeholder meetings provide opportunities for citizens, businesses, government agencies, associations, etc. 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 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 Consistent Implementation of Protection Measures.

In addressing the impacts from anticipated population growth and increased land development in the basin, future management will need to increase its understanding of roles and 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 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 that 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 work out 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 the Association of County Commissioners in cooperation with the Georgia EPD, the Georgia Municipal Association, 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 7.3, 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 Coosa River basin will enter into its second iteration of the basin management cycle (scheduled for April 2000). The next cycle will provide an opportunity to review issues that were not fully addressed during the first cycle and to reassess or identify 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 an Historical Reference for the Next Basin.

Partners will not have to start from scratch during the next iteration of the basin planning cycle. The information in this document provides an historical account of what is known and planned to date. Stakeholders in the Coosa basin will know what was accomplished in the first iteration, and can therefore 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 Coosa, Oconee, and Tallapoosa River basins in accordance with the EPD basin planning schedule. Intensive monitoring will return to the Coosa basin in support of the next iteration of the basin planning cycle in 2001. Prior to this time, EPD and partners will develop a strategic monitoring plan for the Coosa, documented through a written monitoring plan. 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 Chattahoochee basin is summarized in the following table:

HUC 03150101 - Conasauga River Basin

1938	City of Chatsworth built a 0.125 MGD trickling filter plant.
1939	City of Dalton built a 0.5 MGD trickling filter plant.
1952	City of Dalton built the Abutment Road WTF a 1.5 MGD trickling filter plant and abandoned the 1939 facility.
1955	Vulcan Materials Company in Dalton built settling pond. Typically no discharge.
1962	City of Dalton upgraded and expanded the Abutment Plant to 12 MGD.
late 60s	C&J Company in Dalton built settling ponds.
1968	City of Chatsworth upgraded the trickling filter plant to extended aeration for 0.75 MGD.
1972	City of Dalton built the Riverbend Road Plant, a 30 MGD activated sludge facility.
1980	City of Chatsworth upgraded and expanded to 1.25 MGD.
1985	Dow Chemical Company in Dalton built a dissolved air floatation unit and biological oxidation unit, $850,000.
1985-88	City of Chatsworth upgraded, $352,000.
1988	Dow Chemical Company in Dalton ground water remediation system, $1,025,000.
1988	City of Chatsworth built 3.0 MGD extended aeration system, $3,997,000.
1990	Dow Chemical Company upgrade $250,000.
1990	Dalton Utilities built 30 MGD land application system, $68,700,000.
1993	City of Chatsworth upgrade, $400,000.
1995	Dow Chemical Company additional ground water recovery wells, $200,000.

HUC 03150102 - Coosawattee River Basin

1986	City of Ellijay WPCP upgraded.
1989	City of Fairmount constructed a 0.14 MGD overland flow treatment system.
1991	City of Ellijay upgraded and expanded to 2.5 MGD.

HUC 03150103 - Oostanaula River Basin

before 1950	City of Adairsville built an imhoff tank system for 0.2 MGD.
1957	Vulcan Materials Company in Kennesaw built a treatment system.
1960's	City of Adairsville added an oxidation pond.

1966	Georgia - Cumberland Academy built a 0.0016 MGD stabilization pond.
1977	The Goodyear Tire and Rubber Company in Calhoun built a treatment system for $300,000.
1981	Florida Tile built pond in Shannon.
1983	Gordon County Schools built a sand filtration treatment system with disinfection.
1985	Florida Tile Shannon facility modified to eliminate process wastewater discharge with domestice waste to the Floyd County Sewer System.
1985	The Goodyear Tire and Rubber Company wastewater plant upgrade, $50,000.
1989	Vulcan Materials Company in Adairsville built treatment system.
1990	City of Calhoun 12 MGD WPCP constructed.
1991	City of Adairsville North Plant 1.0 MGD activated sludge system constructed $1,300,000.
1991	General Electric Company in Rome built treatment system, $1,700,000.
1994	Vulcan Materials Company in Bartow County built ponds.
1995	General Electric Company in Rome expanded treatment system, $1,500,000.
1997	City of Calhoun WPCP expanded to 16 MGD.

HUC 03150104 - Etowah River Basin

1954	Central Soya built treatment system in Canton.
1961	Gold Kist Poultry By-products anaerobic pond and facultative lagoon constructed.
1963	Haven Hill Mobile Home Park constructed treatment system, $100,000.
1964	Dawsonville pond constructed, $71,000.
1965	Canton Textile Mill WPCP constructed.
1968	Central Soya constructed two lagoons.
1969	Canton WPCP constructed for approximately $625,000.
Late 60's	Reinhardt College constructed an activated sludge WPCP with chlorine contact chamber.
1970	Bells Ferry Mobile Home Park installed a Defiance WPCP with chlorine contact chamber.
1971	Seaboards Farms of Canton, Inc. constructed a clarifier and dissolved air flotation system.
1972	Canton Textile Mill WPCP upgraded with construction of a 1 MG equalization basin.
1972	City of White treatment system, $50,000.
1972	Allatoona Campground treatment system constructed.
1972	City of Emerson built 0.275 MGD treatment system, $182,000.
1973	Chemical Products Corporation built 0.4 MGD treatment system, $160,000.
1973	Cobb Noonday Creek WPCP constructed, consisting of a 0.75 MGD activated sludge facility, $1,000,000.
1973	Big Canoe WPCP 0.27 MGD system, $195,000.
1974	Paulding County School System W.C. Abney Elementary treatment plant.
1974	Fairway Villas Mobile Home Park constructed a Defiance package wastewater treatment plant and a holding pond.
1975	Bartow County School System treatment system.
1975	Gold Kist Poultry By-products WPCP upgraded with construction of an aeration basin and an additional facultative lagoon.
1975	Big Canoe 0.032 MGD expansion, $90,000.
1976	Tate Housing Authority constructed a 0.01 MGD activated sludge system WPCP with sand filter and chlorination for $45,000.
1976	Fulton County Little River WPCP constructed, consisting of five Clow extended aeration package plants operating in parallel followed by two double cell Hydroclear sand filters.

1976	Bartow County Two Run Creek WPCP upgraded and expanded to 0.1 MGD.
1977	Seaboard Farms of Canton, Inc. added a chlorination chamber at a cost of $80,000.
Late 70's	Eastgate Mobile Home Park constructed a 1.5 acre oxidation pond and a half acre polishing pond.
1979	U.S. Army Corps of Engineers, Clark Creek South Campground 0.0042 MGD treatment system, $56,000.
1979	U.S. Army Corps of Engineers, McKaskey Creek Campground 0.0042 MGD treatment system, $56,000.
1980	U.S. Army Corps of Engineers, Project Manager's Office 0.0042 treatment system $56,000.
1981	Cobb County Noonday Creek WRF upgraded and expanded to 10 MGD $13,000,000.
1981	Forsyth County Board of Education constructed a treatment plant to serve Coal Mountain Elementary School and North Forsyth Middle School for approximately $110,000.
1982	Big Canoe 0.04 MGD expansion, $75,000.
1982	Cobb Noonday Creek WPCP replaced with an 8 MGD facility using rotating biological contactors for nitrification with effluent filtration and the capability to chemically remove phosphorus.
1983	Chemical Products Corporation improvements, $122,000.
1983	Fulton County Little River WPCP was modified by adding a reactor clarifier and chemical addition for phosphorus removal, new aeration system, and expanded chlorine contact tank to increase the plant capacity to 0.35 MGD at a cost of $1,100,000.
1983	City of Dallas North Plant 0.25 MGD, $1,700,000.
1983	U.S. Army Corps of Engineers, Victoria Campground, Payne Park Campground, Clark Creek North, Old Highway 41 #3 Campground, McKinney Campground (Sites 1 and 2), $350,000.
1986	Cobb Noonday Creek WPCP modified by addition of the activated sludge process.
1986	City of Jasper WPCP constructed at a cost of $2,989,437. The plant consists of mechanical bar screen, aerated grit chamber, aeration basin, return sludge, two clarifiers, chlorine contact chamber, sludge holding tank, drying beds, and emergency holding pond. The plant was designed for flow up to 0.780 MGD.
1986	U.S. Army Corps of Engineers, Cooper Furnace PUA 0.0042 MGD, $21,000; Gaults PUA 0.0042 MGD, $45,000.
1987	Reinhardt College WPCP upgraded by adding: aerated surge tank' parallel aeration basin; additional clarifier; and digester at a cost of $43,000.
1987	Cobb Northwest Water Reclamation Facility began operation as a 2.0 MGD advanced wastewater facility, using chemical phosphorus removal, nitrification, effluent filtration, and post-aeration.
1987	Fairway Villas Mobile Home park WPCP upgraded with the addition of a rock filter at a cost of $79,147.
1987	City of Cartersville WPCP expanded to 10 MGD.
1988	City of White treatment system re-built, $12,000.
1988	Acworth WPCP taken out of service. Flow routed to the Cobb Northwest Facility.
1988	Cobb Northwest Water Reclamation Facility expanded to 4 MGD.
1989	Dawsonville WPCP modified by installing mechanical aerators and one baffle in the pond, $17,000.
1989	Woodstock WPCP constructed at a cost of $1,578,940. The facility is a 0.5 MGD sequencing batch reactor system.
1989	Seaboard Farms of Canton, Inc. WPCP modified by the addition of thermal dewatering at a cost of $66,000.

1989 Cherokee County Water and Sewerage Authority Rose Creek WPCP constructed for a flow of 2 MGD uses coarse screens, fill and draw type sequencing batch reactors, rotating screens, equalization basin, rapid mix basin, chemical clarifiers, sand filters, and chlorine contact basins. The facility cost $8,400,000.

1990 City of Dallas West Plant upgraded and expanded to 1 MGD, $1,500,000.

1991 Canton WPCP upgraded at a cost of $340,000. This 1.89 MGD facility consists of: mechanical bar screen, extended aeration activated sludge process, and chlorination. The sludge is digested for 40-60 days, dried on drying beds or belt filter press, and land applied.

1991 Chemical Products Corporation upgraded the aeration system, $170,000.

1991 Fulton County Little River WPCP completely replaced except for one of the original Clow package plants is used for waste solids handling. The new facility consists of a new influent pumping station, bar screen, two parallel Bardenpho basins for nitrification, phosphorous removal, and denitrification. Gravimetric solids separation follows in two circular clarifiers, which overflow to an intermediate pump station which transfer the flow to two Dynasand up-flow filters. Filtered effluent is disinfected by ultraviolet light before flowing through two static aerators and discharging to the Little River tributary to lake Allatoona. The cost of this facility was $5,200,000.

1991 Canton Textile Mill WPCP taken out of service on 6-1-91.

1992 Dawsonville WPCP modified with an additional pond baffle at a cost of $5,000.

1992 Seaboard Farms of Canton, inc. WPCP upgraded with a new circular clarifier and pH controller at a cost of $553,400.

1992 City of Cartersville WPCP expanded to 12.1 MGD.

1992 Cobb Northwest Water Reclamation facility rerated by EPD from 4 to 5 MGD. Also, a force main, storage pond, and irrigation system were constructed for land application of reclaimed water at the Lake Acworth Golf Course.

1992 Seaboard Farms of Canton, Inc. WPCP modified by addition of an Aire-O aerator and primary and secondary screening at a cost of $611,000.

1993 Cobb Noonday Creek water Reclamation Facility expansion to 12 MGD completed. The treatment process consists of screening, grit removal, primary clarification, activated sludge, secondary clarification, effluent filtration, effluent chlorination/dechlorination, and post-aeration. Sludge treatment includes aerated sludge holding tanks, belt thickeners, belt press sludge dewatering, and fluidized bed incineration, $20,000,000.

1993 City of Dallas North Plant upgraded and expanded to 0.5 MGD, $837,000.

1994 Cherokee County Water and Sewerage Authority Fitzgerald Creek Land Application Treatment Facility expanded to 0.33 MGD, $1,500,000.

1996 City of Rockmart WPCP expanded to 3.0 MGD.

HUC 03150105 - Coosa River Basin below Rome, and Chattooga River

1937 City of Cedartown constructed 1.2 MGD treatment system.

1954 Inland Paperboard and Packaging, Inc. 1 MG aeration tank.

1954 Georgia Power Plant Hammond 0.01 MGD Clow activated sludge treatment system.

1961 Inland Paperboard and Packaging, Inc. treatment plant upgraded with addition of surge tank, trickle tower, nutrient feed systems and ponds.

1963 Inland treatment plant upgraded by adding inner surge tank, primary clarifier and sludge pond.

1965 Inland treatment plant upgraded by installing eight surface aerators in ponds.

1966 City of Rome constructed 6.0 MGD trickling filter plant.

1967 City of Cave Spring constructed 0.22 MGD extended aeration system, $133,000.

1967 City of Trion activated sludge treatment system constructed.

1967	Chattooga County School built Lyerly Elementary School treatment system.
1968	City of Summerville extended aeration treatment system constructed.
1969	Mohawk Industries, Inc. Lyerly Plant treatment system constructed, $179,000.
1970	Mohawk Lyerly system upgraded, $211,600.
1971	City of Trion WTF upgraded.
1972	GEO Specialty Chemicals Cedartown treatment system, $1,100,000.
mid 70s	City of Rome WPCP upgraded and expanded to 18 MGD.
1976	City of Rome 0.5 MGD Coosa WPCP built by Floyd County.
1981	Mohawk Industries, Inc. Lyerly Plant upgrade, $300,000.
1982	GEO Specialty Chemicals in Cedartown upgraded, $477,000.
1985	Zartic, Inc. in Rome constructed 0.2 MGD pretreatment system which discharges to City of Rome sewer.
1985	Inland WPCP upgraded, $1,146,000.1986 City of Cedartown expanded to 2.25 MGD and upgraded from trickling filter to activated sludge system $2,183,000.
1986	City of Rome WPCP upgraded and expanded to 18 MGD, $16,550,509.
1987	Inland WPCP sludge system upgraded, $1,600,000.
1987	GEO Specialty Chemicals treatment system upgraded, $262,000.
1989	Inland WPCP upgraded, $1,740,000.
1989	GEO Specialty Chemical treatment system upgraded with polymer system, $68,000.
1990	City of Menlo 0.1 MGD wastewater treatment pond, $839,567.
1990	City of Summerville WPCP upgraded with automatic bar screens and belt press.
1991	City of Rome Coosa WPCP upgraded and expanded to 2 MGD, $2,951,091.
1992	Zartic, Inc. pretreatment system upgraded, $115,838.
1997	City of Trion WTF upgraded.
1998	City of Cedartown system expanded to 3.5 MGD $2,600,000.

NPDES Permits for Discharges in the Coosa River Basin

Facility Name	NPDES #	Permitted Flow (MGD)	Major?	County	Receiving Stream
HUC 03150101					
Chatsworth WPCP	GA0032492	3.000	Y	Murray	Holly Creek
DNR Fort Mountain	GA0049191	0.007		Murray	Fort Mountain Lake tributary to Holly Creek
Whitfield Mt. View Acres WPCP	GA0047848	0.084		Whitfield	Stone Branch
Spring Place Elementary	GA0034967	None		Murray	Town Branch to Conasauga River
Cohutta Springs	GA0035696	0.039		Murray	
Dow Chemical Co., Dalton	GA0000426	N/A		Whitfield	Conasauga River
C&J Co. Truck Terminal, Dalton	GA0000574	N/A		Whitfield	unnamed tributary to Swamp Creek
Vulcan Mat, Whitfield	GA0003972	N/A		Whitfield	Coahulla Creek
Papaw's Park	GA0022560	0.012		Whitfield	Swamp Creek
Whispering Pines, MHP	GA0023426	0.038		Whitfield	Ketcham Creek
Dawnville Elementary	GA0034002	0.012		Whitfield	Smithey Branch
Dug Gap Elementary	GA0034011	0.01		Whitfield	Drowning Bear Creek tributary
Varnell Elementary	GA0034029	0.016		Whitfield	Spring Creek
Eastbrook Middle School	GA0034037	0.016		Whitfield	Davis Creek
Con Agra Broiler Co.	GA0035700	N/A		Whitfield	Pitner Branch / Little Creek tributary
Whitfield Co. Public Schools	GA0047660	0.012		Whitfield	Mount Vernon Creek
Calloway Chemical Co.	GA0048020	N/A		Whitfield	Swamp Creek
Antioch Elementary	GA0048488	0.005		Whitfield	Davis Creek to Conasauga River
Super 8 Motel	GA0048887	0.025		Whitfield	Unnamed tributary to Conasauga River
Westside Elementary School	GA0049158	0.015		Whitfield	Mount Vernon Creek
HUC 03150102					
Ellijay WPCP	GA0021369	2.5	Y	Gilmer	Coosawattee River
Oakland Elementary School	GA0047210	0.125		Gilmer	Licklog Creek

Facility Name	NPDES #	Permitted Flow (MGD)	Major?	County	Receiving Stream
HUC 03150103					
Calhoun WPCP	GA0030333	16	Y	Gordon	Oostanaula River
Adairsville South WPCP	GA0032832	0.5		Bartow	Oothkalooga Creek trib.
Goodyear Tire Company	GA0000329	N/A	Y	Gordon	Oothkalooga River
WL Swain Elementary School	GA0032221	0.006		Gordon	Robbins Creek
Cumberland Academy	GA0035947	0.016		Gordon	
Vulcan Mat, Bartow	GA0033413	N/A		Bartow	Oothkalooga Creek
Florida Tile, Shannon	GA0048151	N/A		Floyd	unnamed tributary to Woodward Creek
NW GA Regional Hospital	GA0035548	N/A		Floyd	
GE Company, Rome	GA0024155	N/A	Y	Floyd	Horse Creek / Little Dry Creek
Florida Rock Ind., Floyd	GA0003956	N/A		Floyd	Little Dry Creek
HUC 03150104					
Bartow Co., Two Run WPCP	GA0020702	0.1		Bartow	Two Run Creek
Cartersville WPCP	GA0024091	12	Y	Bartow	Etowah River
Emerson Pond	GA0026115	0.265		Bartow	Pumpkinvine Creek
DNR Red Top Mountain	GA0029891	0.003		Bartow	Lake Allatoona trib.
Dawsonville Pond	GA0021121	0.06		Dawson	Flat Creek
Jasper WPCP	GA0032204	0.8		Pickens	Hammond's Creek
Fulton Co. Little River WPCP	GA0033251	0.85		Cherokee	Little River
Canton WPCP	GA0025674	1.89	Y	Cherokee	Etowah River
Cherokee Co. Water & Sewer	GA0046451	5.2	Y	Cherokee	Lake Allatoona
Woodstock Pond	GA0026263	0.5		Cherokee	Rube's Creek tributary
Cobb Co., Noonday WPCP	GA0024988	12	Y	Cobb	Noonday Creek
Cobb Co., Northwest WPCP	GA0046761	4	Y	Cobb	Lake Allatoona
Dallas West WPCP	GA0026026	0.9	Y	Paulding	Weaver Creek tributary
Dallas North WPCP	GA0026034	0.5		Paulding	Lawrence Creek
Rockmart WPCP	GA0026042	1.2	Y	Polk	Euharlee Creek
Polk Co., Aragon WPCP	GA0026182	0.17		Polk	Euharlee Creek tributary
Chemical Products Corp., #281	GA0000281	N/A		Bartow	Etowah River
Goodyear Tire & Rubber Co.	GA0000515	N/A		Bartow	Pettit Creek / Nancy Creek
First Brands Corporation	GA0000591	N/A		Bartow	Etowah River
Cimbar Performance Minerals	GA0001287	N/A		Bartow	Etowah River
Chemical Products Corp., #1295	GA0001295	N/A		Bartow	Etowah River
Georgia Power, Bowen	GA0001449	N/A	Y	Bartow	Etowah River
Alatoona Campground	GA0022616	0.02		Bartow	Lake Allatoona
Best Western Inn	GA0023540	0.006		Bartow	Pettit Creek

Facility Name	NPDES #	Permitted Flow (MGD)	Major?	County	Receiving Stream
New Riverside Ochre Co.	GA0029823	N/A		Bartow	Etowah River
White Elementary	GA0029904	0.013		Bartow	Pettit Creek
Criterion Mill, Cartersville	GA0032751	N/A		Bartow	Etowah River
Vulcan Mat, Bartow	GA0033413	N/A		Bartow	Oothkalooga Creek
Riverside Products Co.	GA0047333	N/A		Bartow	Etowah River
Stone Man Inc.	GA0047635	N/A		Bartow	Two Run Creek to tributary of Etowah River
GA Marble Co., Mar Hill	GA0000477	N/A		Pickens	East Branch Long Swamp Creek
GA Marble Co., Nelson	GA0000485	N/A		Pickens	Spence Creek
GA Marble Company	GA0001261	N/A		Pickens	Long Swamp Creek
Tate Housing Project	GA0029955	N/A		Pickens	Long Swamp Creek
Big Canoe WPCP	GA0030252	0.025		Pickens	Blackwell Creek
Tate Elementary School	GA0048518	0.007		Pickens	Mud Hollow Creek
Gold Kist Poultry Products	GA0000728	N/A		Cherokee	Etowah River
Seaboard Farms of Canton	GA0001724	N/A		Cherokee	Blankets Creek
Reinhart College, Waleska	GA0024228	0.024		Cherokee	Moore's Creek
Oak Grove Elementary	GA0031461	0.005		Cherokee	Kellogg Creek
Shadowood Assoc.	GA0031585	0.07		Cherokee	Owl Creek
Free Home Elementary	GA0034185	None		Cherokee	Buzzard Flapper Creek
Little River Elementary	GA0034363	None		Cherokee	Little River
RM Moore Elementary	GA0034959	None		Cherokee	Moore's Creek
Blue Circle	GA0047031	N/A		Cherokee	unnamed tributary to Etowah River
Vulcan Mat, Cobb	GA0000787	N/A		Cobb	Noonday Creek
Eastgate MHP	GA0022292	0.31		Cobb	Owl Creek
Fairway Villas MHP	GA0026611	0.015		Cobb	tributary to Etowah River
WC Abney School	GA0029921	0.01		Paulding	Possum Circle
Three Cedars MHP	GA0032042	0.014		Paulding	Pickett's Creek
Engineered Fabrics Co.	GA0000523	N/A		Polk	unnamed tributary / Euharlee Creek
Slate Scape Inc.	GA0001929	N/A		Polk	Lake Darren Creek tributary
Lindale Manuf.. Inc.	GA0000345	N/A		Floyd	Silver Creek
Williams Brothers Concrete	GA0047601	N/A		Fulton	unnamed tributary to Foe Killer Creek
USA Forscom Rec. Area	GA0027456	0.007		Bartow	Lake Allatoona
USA COE McKinney Campgr.	GA0047465	None		Bartow	Lake Allatoona
USA COE Clark Creek Campgr.	GA0048305	0. 004		Bartow	
HUC 03150105					
Cedartown WPCP	GA0024074	2.5	Y	Polk	Cedar Creek

Facility Name	NPDES #	Permitted Flow (MGD)	Major?	County	Receiving Stream
Rome WPCP	GA0024112	18	Y	Floyd	Coosa River
Rome, Coosa WPCP	GA0024241	2	Y	Floyd	Coosa River
Cave Spring WPCP	GA0025721	0.22		Floyd	Cedar Creek
Trion WPCP	GA0024607	5	Y	Chattooga	Chattooga River
Summerville WPCP	GA0025704	2	Y	Chattooga	Chattooga River
LaFayette WPCP	GA0025712	3.5	Y	Walker	Chattooga Creek
Zartic Inc.	GA0032085	N/A		Polk	Cedar Creek
Georgia Speciality Chemicals	GA0001708	N/A	Y	Polk	Cedar Creek, Big Spring Branch
Inland Container Corp	GA0001104	N/A	Y	Floyd	Smith Cabin Creek
Georgia Power, Hammond	GA0001457	N/A	Y	Floyd	Coosa River
Mount Vernon Mills	GA0001422	N/A		Chattooga	Chattooga River
Leverly Elementary	GA0022144	0.006		Chattooga	Mosteler Creek
Mohawk Carpets	GA0024104	2.5	Y	Chattooga	Chattooga River
Harriet & Henderson Berryton	GA0000841	N/A		Chattooga	Racoon Creek

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

Table E-I. Support of Designated Uses for Rivers and Streams in Hydrologic Unit 03150101 of the Coosa River Basin, 1996-1997

Name	Location (HUC 03150101)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses										
Caldwell Mills Creek (4)	Coahulla Creek Tributary - Whitfield County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Coahulla Creek (4)	Whitfield County	Fishing	S	N/A	N/A	N/A	1	N/A	N/A	N/A
Conasauga River (1,12)	Headwaters to Stateline - Murray/Fannin Counties	Wild and Scenic/Fishing	S	N/A	N/A	N/A	15	N/A	N/A	N/A
Dill Creek (4)	Murray County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Emery Creek (4)	Murray County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Holly Creek (4)	Murray County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Mill Creek (4)	Murray County	Drinking Water	S	N/A	N/A	N/A	9	N/A	N/A	N/A
Murray Creek (12)	Fannin County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
North Prong Sumac Creek (4)	Murray County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Panther Creek (12)	Fannin County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Penitentiary Branch (12)	Fannin County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Poplar Camp Creek (12)	Fannin County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A

Name	Location (HUC 03150101)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rock Creek (1)	Headwaters to Holly Creek - Murray County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Rough Creek (12)	Fannin County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Spring Creek (4)	Whitfield County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Sugar Cove Branch (12)	Fannin County	Fishing	S	N/A	N/A	N/A	1	N/A	N/A	N/A
Sumac Creek (1)	Coffey Lake to Conasauga River	Fishing	S	N/A	N/A	N/A	9	N/A	N/A	N/A
Rivers and Streams Partially Supporting Designated Uses										
Bear Branch (12)	Fannin County	Fishing	PS	Cu,Zn	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	2	X	X	2
Beech Creek (12)	Fannin County	Fishing	PS	pH,Cd	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	1	X	X	2
Coahulla Creek (1)	Below 728 Road to Mill Creek	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	5	X	X	3
Conasaug River (1)	Hwy. 286 to Holly Creek - Whitfield/Murray Counties	Fishing/Drinking Water	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	18	X	3	3
Hickory Creek (12)	Murray/Fannin Counties	Fishing	PS	Cu	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	4	X	X	2
Holly Creek (1)	Rock Creek to Conasauga River	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	8	X	X	3

Name	Location (HUC 03150101)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Holly Creek (1,2)	Downstream Chatsworth WPCP - Murray County	Fishing	PS	Cd,Tox	M	Chatsworth completed Individual Control Strategy to comply with metals limits in 1994 and completed installation of facilities to meet total residual chlorine toxicity limits through the NPDES permit in December 1997.	4	X	1	NA
Jacks River (1,12)	West/South Forks to Stateline	Wild/Scenic	PS	Zn	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	22	X	X	2
Rice Camp Branch (12)	Fannin County	Fishing	PS	Cd	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	3	X	X	2
Rough Creek (12)	Murray County	Fishing	PS	pH,Cu	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	2	X	X	2
Swamp Creek (1)	Headwaters to confluence with Conasauga River	Fishing	PS	FCG	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin. Fish consumption guidance due in part to natural source of mercury.	13	X	X	3
Rivers and Streams Not Supporting Designated Uses										
Conasauga River (1)	Holly Creek to Oostanaula River - Murray/Gordan Counties	Fishing	NS	FC,Pb*	M,UR	EPD will address nonpoint source (urban runoff) thorugh a watershed protection strategy for the basin. Dalton under Consent Order to correct land application system operational problems. Comprehensive enforcement action underway.	24	X	2,X	1,3

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
M = Municipal Facility
NP = Nonpoint Sources/ Unknown Sources
UR = Urban Runoff/Urban Effects

Table E-2. Support of Designated Uses for Rivers and Streams in Hydrologic Unit 03150102 of the Coosa River Basin, 1996-1997

Name	Location (HUC 03150102)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses										
Anderson Creek (4)	Gilmer County	Fishing	S	N/A	N/A	N/A	13	N/A	N/A	N/A
Cartecay River (1)	Licklog Creek to Owltown Creek	Drinking Water	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Clear Creek (4)	Gilmer/Pickens Counties	Fishing	S	N/A	N/A	N/A	13	N/A	N/A	N/A
Coosawattee River (1)	U.S. Hwy. 411 to Noblet Creek (Downstream Carters Lake)	Drinking Water	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Coosawattee River (1)	Salacoa Creek to Oostanaula River - Gordon County	Drinking Water	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Ellijay River (4)	Upstream Ellijay - Gilmer County	Drinking Water	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Fawcett Creek (4)	Gilmer County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Fisher Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Harris Creek (1)	Upstream Carters Lake - Gilmer County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Hobson Creek (4)	Tributary to Talking Rock Creek - Pickens County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Little Scarecorn Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Long Branch (4)	Gordon/Pickens Counties	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Mountaintown Creek (4)	Gilmer County - Headwaters to Hwy. 282	Fishing	S	N/A	N/A	N/A	15	N/A	N/A	N/A

Name	Location (HUC 03150102)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Mud Creek (4)	Tributary to Talking Rock Creek - Pickens County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Pin Hook Creek (4)	Gordon County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Pine Log Creek (4)	Hwy 140 to Cedar Creek - Cherokee/Bartow Counties	Fishing	S	N/A	N/A	N/A	18	N/A	N/A	N/A
Rock Creek (4)	Gilmer County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Salacoa Creek (4)	Henderson Mountain Road to Hwy 61	Fishing	S	N/A	N/A	N/A	19	N/A	N/A	N/A
Scarecorn Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Sugar Cove Branch (12)	Fannin County	Fishing	S	N/A	N/A	N/A	1	N/A	N/A	N/A
Tails Creek (4)	Headwaters to Hwy. 282 - Gilmer County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Talking Rock Creek (11)	Upstream Carters Lake - Gordon County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Talking Rock Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Talona Creek (4)	Gilmer County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Town Creek (4)	Gilmer County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Rivers and Streams Partially Supporting Designated Uses										
Cartecay River (1)	Owltown Creek to Coosawattee River	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	3	X	X	3

Name	Location (HUC 03150102)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Cox Creek	Ellijay - Gilmer County	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	3	X	3	3
Mountaintown Creek (1)	Hwy. 282 to Coosawattee River	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	5	X	X	3
Talking Rock Creek (1)	Ga. Hwy. 136 to Pickens/Gilmer County Line	Fishing	PS	FC,FCG	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	19	X	X	3
Tails Creek (1)	Hwy. 282 to Carters Lake	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	3	X	X	3
Rivers and Streams Not Supporting Designated Uses										
Coosawattee River (1)	Confluence with Ellijay and Cartecay Rivers to Mountaintown Creek	Fishing	NS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin	9	X	X	3
Ellijay River (1)	Upstream Coosawattee River	Fishing	NS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	2	X	X	3
Flat Creek (1)	Upstream Coosawattee River - Gilmer County	Fishing	NS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	1	X	X	3
Pine Log Creek (1)	Cedar Creek to Salacoa Creek - Gordon County	Fishing	NS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	6	X	X	3

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
M = Municipal Facility
NP = Nonpoint Sources/ Unknown Sources
UR = Urban Runoff/Urban Effects

Table E-3. Support of Designated Uses for Rivers and Streams in Hydrologic Unit 03150103 of the Coosa River Basin, 1996-1997

Name	Location (HUC 03150103)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses										
Concord Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Dry Creek (4)	Tributary to Armuchee Creek - Walker County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
East Armuchee Creek (4)	Upstream Hwy. 136 - Walker County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Furnace Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Johns Creek (4)	Floyd County	Fishing	S	N/A	N/A	N/A	8	N/A	N/A	N/A
Little Armuchee Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Oostanaula River (1)	Confluence of Conasauga & Coosawattee Rivers to Oothkalooga Creek	Drinking Water/Fishing	S	N/A	N/A	N/A	11	N/A	N/A	N/A
Rock Mountain Creek (29)	Rocky Mountain Project - Floyd County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Rocky Creek (4)	Gordon County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Ruff Creek (4)	Headwaters to Armuchee Creek - Chattooga County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Snake Creek (4)	Gordon/Walker Counties	Fishing	S	N/A	N/A	N/A	8	N/A	N/A	N/A
Storey Mill Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
West Armuchee Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	9	N/A	N/A	N/A

Name	Location (HUC 03150103)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Partially Supporting Designated Uses										
Lavendar Creek	Rocky Mountain Project - Floyd County	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	8	X	3	3
Oostanaula River (1)	Oothkalooga Creek to Hwy 156	Fishing	PS	FC,FCG	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	5	X	X	3
Tributary to Oothkalooga Creek (2)	Peters Street to Oothkalooga Creek - Calhoun	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	1	X	X	3
Rivers and Streams Not Supporting Designated Uses										
Armuchee Creek (28)	Oostanaula River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	20	X	2	1
Burwell Creek	Rome	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	3	X	2	1
Dozier Creek (1)	Oostanaula River Tributary	Fishing	NS	CFB,Cu, Pb*,Tox	I2,I1	Galey and Lord scheduled to eliminate discharge by 9/30/97. DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	3	X	2	1
Heath Creek (29)	Upstream Rocky Mtn. Project - Floyd County	Fishing	NS	Hg,Pb	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	1	X	X	2
Heath Creek (29)	Downstream Rocky Mountain Project - Floyd County	Fishing	NS	Hg	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	5	X	X	2

Name	Location (HUC 03150103)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Johns Creek	Oostanaula River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	6	X	2	1
Little Dry Creek	Tributary to Oostanaula River - Rome	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	6	X	2	1
Muck Creek	Oostanaula River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	5	X	2	1
Oostanaula River (1,2)	Hwy 156 to Coosa River	Fishing/Drinking Water	NS	FC,CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining. Note: FCG is a partial support.	32	X	X,2	3,1
Robbins Creek	Oostanaula River Tributary - Gordon County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	2	X	2	1
Ward Creek (1)	Shannon - Floyd County	Fishing	NS	Tox,Pb,Cu	I1	Galey and Lord eliminated the discharge to Ward Creek 9/30/97.	1	X	2	1
Woodward Creek	Oostanaula River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	8	X	2	1

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
M	=	Municipal Facility
NP	=	Nonpoint Sources/ Unknown Sources
UR	=	Urban Runoff/Urban Effects

Table E-4. Support of Designated Uses for Rivers and Streams in Hydrologic Unit 03150104 of the Coosa River Basin, 1996-1997

Name	Location (HUC 03150104)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses										
Amicalola Creek (4)	Hwy 52 to Etowah River - Dawson County	Fishing	S	N/A	N/A	N/A	24	N/A	N/A	N/A
Blankets Creek (24)	Lake Allatoona Tributary - Cherokee County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Boston Creek (24)	Lake Allatoona Tributary - Bartow/Cherokee Counties	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Burt Creek (4)	Dawson County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Clear Creek (24)	Lake Allatoona Tributary - Bartow County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Cochran Creek (4)	Dawson County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Cooper Creek (24)	Lake Allatoona Tributary - Bartow County	Fishing	S	N/A	N/A	N/A	1	N/A	N/A	N/A
Darnell Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Downing Creek (24)	Lake Allatoona Tributary - Cherokee County	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Etowah River (4)	Lumpkin County	Fishing	S	N/A	N/A	N/A	21	N/A	N/A	N/A
Etowah River (1)	Dawson County	Fishing	S	N/A	N/A	N/A	24	N/A	N/A	N/A
Etowah River (1)	Richland Creek to Euharlee Creek - Bartow County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Fourmile Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A

Name	Location (HUC 03150104)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Illinois Creek (24)	Lake Allatoona Tributary - Bartow/Cherokee Counties	Fishing	S	N/A	N/A	N/A	2	N/A	N/A	N/A
Jones Creek (4)	Lumpkin County	Fishing	S	N/A	N/A	N/A	8	N/A	N/A	N/A
Long Swamp Creek (1)	Hwy 53 to Etowah River - Near Ball Ground	Fishing	S	N/A	N/A	N/A	8	N/A	N/A	N/A
McKaskey Creek (24)	Lake Allatoona Tributary - Bartow County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Montgomery Creek (4)	Lumpkin County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Nimblewill Creek (4)	Lumpkin County	Fishing	S	N/A	N/A	N/A	8	N/A	N/A	N/A
Polecat Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Possum Creek (4)	Paulding County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Pumpkinvine Creek (4)	Paulding County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Pyle Creek (4)	Bartow County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Racoon Creek (4)	Paulding County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Rock Creek (4)	Pickens County	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Rose Creek (24)	Lake Allatoona Tributary - Cherokee County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Shoal Creek (4)	Dawson County	Fishing	S	N/A	N/A	N/A	10	N/A	N/A	N/A

Name	Location (HUC 03150104)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Spring Creek (4)	Floyd County (Upstream Fishing Ban Area)	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Sweetwater Creek (4)	Dawson County	Fishing	S	N/A	N/A	N/A	3	N/A	N/A	N/A
Toms Creek (4)	Bartow County (Upstream Fishing Ban Area)	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Two Run Creek (4)	Bartow County Upstream Fishing Ban Area	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Ward Creek (4)	Paulding/Bartow Counties	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Rivers and Streams Partially Supporting Designated Uses										
Allatoona Creek (14,24)	Cobb County	Fishing	PS	FC,Pb	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	9	X	2	1
Chastain Branch (2)	Tributary to Noonday Creek	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	2	X	3	3
Etowah River (1)	Sharp Mountain Creek to Lake Allatoona - Cherokee County	Fishing/Drinking Water	PS	Cu,FCG	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	20	X	X	2
Etowah River (1)	Euharlee Creek to US Hwy 411 - Bartow County	Fishing	PS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	10	X	X	3
Euharlee Creek (1)	Hills Creek to upstream Plant Bowen	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	4	X	X	3
Little Allatoona Creek (14)	Cobb County	Fishing	PS	FC,Pb	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	3	X	2	1
Pumpkinvine Creek (1)	Little Pumpkinvine Creek to Etowah River	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	15	X	X	3

Name	Location (HUC 03150104)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rocky Creek (17)	Fulton County	Fishing	PS	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	1	X	2	1
Rivers and Streams Not Supporting Designated Uses										
Acworth Creek (14,35)	Tributary to Lake Acworth	Fishing	NS	FC	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	1	X	2	1
Butler Creek (14,35)	Cobb County	Fishing	NS	FC,Pb	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	6	X	2	1
Connesenna Creek	Etowah River Tributary - Bartow County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	6	X	2	1
Etowah River (1,10,24)	Lake Allatoona to Richland Creek	Fishing	NS	FC,DO	NP,Dam Release	EPD will address nonpoint sources through a watershed protection strategy for the basin. EPD will work with the Corps of Engineers to assess and implement feasible actions.	12	X	X,4	3,2
Etowah River (1)	Hwy. 411 to Coosa River	Fishing	NS	CFB,FC, FCG	I2,NP	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining. EPD will address nonpoint sources through a watershed protection strategy for the basin.	21	X	2,X	1,3
Kellogg Creek (24)	Lake Allatoona Tributary - Cherokee County	Fishing	NS	FC	UR	EPD will address nonpoint sources through a watershed protection strategy for the basin.	3	X	3	3
Little Noonday Creek (14)	Cobb County	Fishing	NS	FC,Pb	UR	Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94.	3	X	2	1
Little River (24)	Hwy 140 to Lake Allatoona - Cherokee County	Fishing	NS	FC	UR	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin.	10	X	X	3

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
M	=	Municipal Facility
NP	=	Nonpoint Sources/ Unknown Sources
UR	=	Urban Runoff/Urban Effects

Table E-5. Support of Designated Uses for Rivers and Streams in Hydrologic Unit 03150105 of the Coosa River Basin, 1996-1997

Name	Location (HUC 03150105)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Rivers and Streams Supporting Designated Uses										
Allen Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Allgood Branch (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Cedar Creek (4)	Polk County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Chappel Creek (4)	Chattooga and Walker Counties	Fishing	S	N/A	N/A	N/A	6	N/A	N/A	N/A
Chelsea Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Duck Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
East Fork Little River (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Harrisburg Creek (4)	Walker County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Hinton Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Left Fork Coulter Branch (4)	Walker County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Little Cedar Creek (4)	Floyd/Polk Counties	Fishing	S	N/A	N/A	N/A	10	N/A	N/A	N/A
Little Cedar Creek (6)	Upstream Cedar Rock Lake - Polk County	Fishing	S	N/A	N/A	N/A	1	N/A	N/A	N/A
Middle Fork Little River (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Perennial Spring (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A

Name	Location (HUC 03150105)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Pumpkinpile Creek (4)	Polk County	Fishing	S	N/A	N/A	N/A	7	N/A	N/A	N/A
Racoon Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	4	N/A	N/A	N/A
Spring Creek (1)	Chattooga County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Spring Creek (4)	Floyd/Polk Counties	Fishing	S	N/A	N/A	N/A	9	N/A	N/A	N/A
Taliaferro Creek (4)	Chattooga County	Fishing	S	N/A	N/A	N/A	5	N/A	N/A	N/A
Rivers and Streams Partially Supporting Designated Uses										
Chappel Creek (2)	Trion	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	2	X	3	3
Chattooga River (1)	Downstream LaFayette - Walker County	Fishing	PS	Chlordane	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	7	X	X	2
Chattooga River (1)	Lyerly to Stateline	Fishing	PS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	7	X	X	3
Rivers and Streams Not Supporting Designated Uses - HUC 03150105										
Beech Creek	Downstream Hicks Lake - Near Rome (Floyd County)	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	10	X	2	1
Big Cedar Creek (1,6)	Cedartown to Coosa River - Polk/Floyd Counties	Fishing	NS	FC,CFB	UR,I2	EPD will address nonpoint sources (urban runoff) through a watershed protection strategy for the basin. DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	35	X	X,2	3,1
Big Dry Creek	Rome	Fishing	NS	FC,CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	3	X	X,2	3,1

Name	Location (HUC 03150105)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Chattooga River (1,2,10)	Trion to Lyerly	Fishing	NS	FC,Cu,Pb, Tox	M	Trion completed Individual Control Strategy to comply with State limits in September 1995. Toxicity is being addressed through the permitting process.	10	X	2	1
Coosa River (1,10)	Rome to Hwy 100 - Floyd County	Fishing	NS	FC,PB*, CFB,FCG	UR,CSO, I2	EPD will address nonpoint source (urban runoff) through a watershed protection strategy for the basin. Rome eliminated CSOs in August 1996. DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	16	X	X,2	3,1
Coosa River (1)	Hwy 100 to Stateline	Fishing	NS	FC,CFB, FCG	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	15	X	X,2	3,1
Hamilton Creek	Coosa River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	5	X	2	1
Horseleg Creek	Rome	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	4	X	2	1
Kings Creek	Coosa River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	4	X	2	1
Mt. Hope Creek	Coosa River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	4	X	2	1

Name	Location (HUC 03150105)	Water Use Classification	Status	Criterion Violated	Evaluated Causes	Actions to Alleviate	Miles	305(b)	303(d)	Priority
Smith Creek	Coosa River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	5	X	2	1
Spring Creek (1)	Chattooga County	Fishing	NS	FC	NP	EPD will address nonpoint sources through a watershed protection strategy for the basin.	5	X	X	3
Webb Creek	Coosa River Tributary - Floyd County	Fishing	NS	CFB	I2	DNR commercial fishing ban due to PCBs which originated from General Electric facility in Rome. Cleanup operations completed in the 1980s. PCB concentrations in fish tissue slowly declining.	4	X	2	1

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
M = Municipal Facility
NP = Nonpoint Sources/ Unknown Sources
UR = Urban Runoff/Urban Effects

Table E-6. Support of Designated Uses for Lakes and Reservoirs in the Coosa River Basin, 1996-1997

Lake Name	Location	Support Category	Water Use Classification	Criterion Violated	Potential Cause(s)	Acres Affected	305(b)	303(d)	Priority
Carters Lake (1)	Gilmer and Murray Counties	Partial Support	Recreation	FCG	NP	3,882	X	X	3
Lake Acworth (14,35)	Upper/Mid-Lake Cobb County	Partial Support	Fishing	FC	UR	194	X	2	1
Lake Allatoona (1,24)	Tanyard Creek Embayment	Partial Support	Drinking Water/Recreation	FCG,FC	UR	84	X	3,X	NA,3
Lake Allatoona (1,24)	Cherokee, Cobb, & Bartow Counties	Partial Support	Drinking Water/Recreation	FCG,Hg,FC	UR	10,831	X	3,X	NA,2
Lake Allatoona (1,24)	Little River Embayment	Partial Support	Drinking Water/Recreation	FCG	NP,UR	950	X	3,X	NA,3

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
M = Municipal Facility
NP = Nonpoint Sources/ Unknown Sources
UR = Urban Runoff/Urban Effects

Georgia Adopt-A-Stream Program

Current Groups List January 1998

Coosa River Basin

Stream :
Name: Judy Peterson
Gordon Central High School

Stream: 7 streams, Fulton Co.
Name: Suzanne Cate
Mountain Park Adopt-A-Stream

Stream: Armuchee Creek (Floyd)
Name: Julie McCormick
Armuchee High School

Stream: Big Creek (Gilmer)
Name: Trip Martin
Pa-Paw's Providence

Stream: Burwell Creek (Floyd)
Name: Jack Chesnut
Rome Middle School
Joanne Moss & Carolyn Petty

Stream: Canton Creek (Cherokee)
Name: Martha Kent
Cherokee Stream Team
Cherokee Clean & Beautiful Commission

Stream: Cartecay River (Gilmer)
Name: Mark Stallings
Gilmer High School

Stream: Dykes, Woodward, and Ward Creeks (Floyd)
Name: Leslie Carroll
Model Middle School Group

Stream: Jack's River (Fannin)
Name: Brett Salter
Friends of Jack

Stream: Johns Creek (Floyd)
Name: Bobby Bell
Trout Unlimited

Stream: Johns Creek (Floyd)
Name: James Payne
Trout Unlimited
The Harbin Clinic

Stream: Little Cedar Creek (Floyd)
Name: John Fichera

Stream: Little Cedar Creek, Johns Creek (Floyd)
Name: Paul DiPrima
Trinity State Real Estate

Stream: Little Eagle Creek (Floyd)
Name: Roselle Lyons
Coosa Middle School
CMS Stream Team

Stream: McLellan Creek (Whitfield)
Name: Brad Britton
Conasauga Adopt-A-Stream
St. Mark's Green Team

Stream: Mill Creek (Murray)
Name: Randall&Freda Stone
The Give-A-Hoochies

Stream: Oothcalooga Crek (Barow)
Name: Dr. O.P. Cooper
A GRIP of Water
NW Georgia RESA, GSAMS

Stream: Rome area
Name: Martha Little
Rome Adopt-A-Stream
Environmental&Historic Planning

Stream: Settingdown Creek
Name: Paul West
North Forsyth Middle School
Stream Team

Stream: Silver Creek (Floyd)
Name: Cheryl Garner
McHenry Elementary School

Stream: Silver Creek and Booze Creek (Floyd)
Name: Cheryl Garner
Pepperell Elementary School

Stream: Silver Creek (Floyd)
Name: Quinton Schwengel
Rome Adopt-A-Stream

Stream: Town Creek (Pickens)
Name: Kelly McArthur
Pickens High School

Stream: Trib. of Armuchee Creek
Name: Cathy McGraw
Armuchee Elementary School
Rome Adopt-A-Stream

Stream: Tributaries to Conasauga River
Name: John Lugthart
Dalton College
Conasauga Watershed AAS

Stream: Trickum Creek (Cobb)
Name: Pam Dixon
Cub Scout Pack 417

Stream: Two Run Creek (Bartow)
Name: Lynne Avery
Cass Middle School
River Kids Network

Stream: Two Run Creek (Bartow)
Name: Sheila Barnes
Cass Middle School
River Kids Network

Stream: Woodward Creek (Floyd)
Name: Thomas Vasil
WCPR Watch

Stream: unnamed Creek (Cobb)
Name: Norm Fagge
Village North Highlands Subdivision