
Savannah River Basin Management Plan 2001



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.]

Savannah River Basin Management Plan 2000

Preface

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

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

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Contents

<i>List of Acronyms and Abbreviations</i>	AA-1
<i>Executive Summary</i>	ES-1
Section 1	
<i>Introduction</i>	1-1
What Is the Purpose of This Plan?	1-1
What’s Inside?	1-2
How Do I Use This Plan?	1-4
What Is the Schedule of Activities for the Savannah River Basin?	1-5
How Do Stakeholders Get Involved in the Basin Planning Process?	1-5
What’s Next?	1-9
Section 2	
<i>River Basin Characteristics</i>	2-1
2.1 River Basin Description	2-1
2.1.1 River Basin Boundaries	2-1
2.1.2 Climate	2-3
2.1.3 Physiography, Geology, and Soils	2-3
2.1.4 Surface Water Resources	2-7
2.1.5 Ground Water Resources	2-16
2.1.6 Biological Resources	2-19
2.2 Population and Land Use	2-25
2.2.1 Population	2-25
2.2.2 Employment	2-25
2.2.3 Land Cover and Use	2-27
2.3 Local Governments and Planning Authorities	2-44
2.3.1 Counties and Municipalities	2-44
2.3.2 Regional Development Centers	2-47
2.4 Water Use Classifications	2-47
2.4.1 Georgia’s Water Use Classification System	2-47
2.4.2 Water Use Classifications for the Savannah River Basin	2-49
References	2-51

Section 3

Water Quantity 3-1

 3.1 Drinking Water Supply 3-2

 3.1.1 Drinking Water Supplies in the Savannah River Basin 3-2

 3.1.2 Drinking Water Demands 3-2

 3.1.3 Drinking Water Permitting 3-13

 3.2 Surface Water Quantity 3-13

 3.2.1 Surface Water Supply Sources 3-13

 3.2.2 Surface Water Supply Demands and Uses 3-13

 3.2.3 Surface Water Withdrawal Permitting 3-17

 3.2.4 Flooding and Floodplain Management 3-18

 3.3 Ground Water Quantity 3-19

 3.3.1 Ground Water Sources 3-19

 3.3.2 Ground Water Supply Demands 3-20

 3.3.3 Ground Water Supply Permitting 3-20

Section 4

Water Quality: Environmental Stressors 4-1

 4.1 Sources and Types of Environmental Stressors 4-1

 4.1.1 Point Sources and Non-discharging Waste Disposal Facilities 4-1

 4.1.2 Nonpoint Sources 4-23

 4.1.3 Flow and Temperature Modification 4-36

 4.1.4 Physical Habitat Alteration 4-37

 4.2 Summary of Stressors Affecting Water Quality 4-37

 4.2.1 Nutrients 4-38

 4.2.2 Oxygen Depletion 4-39

 4.2.3 Metals 4-39

 4.2.4 Fecal Coliform Bacteria 4-39

 4.2.5 Synthetic Organic Chemicals 4-43

 4.2.6 Stressors from Flow and Temperature Modification 4-43

 4.2.7 Sediment 4-43

 4.2.8 Habitat Degradation and Loss 4-44

 References 4-45

Section 5

Assessments of Water Quantity and Quality 5-1

 5.1 Assessment of Water Quantity 5-1

 5.1.1 Municipal and Industrial Water Uses 5-1

 5.1.2 Agriculture 5-2

 5.1.3 Recreation 5-2

 5.1.4 Hydropower 5-7

 5.1.5 Navigation 5-7

5.1.6	Waste Assimilation Capacity	5-7
5.1.7	Assessment of Ground Water	5-7
5.2	Assessment of Water Quality	5-8
5.2.1	Water Quality Standards	5-8
5.2.2	Surface Water Quality Monitoring	5-10
5.2.3	Data Analysis	5-16
5.2.4	Assessment of Water Quality and Use Support	5-17
5.2.5	Assessment of Fish and Wildlife Resources	5-31
	References	5-33

Section 6

	Concerns and Priority Issues	6-1
6.1	Identified Basin Planning and Management Concerns	6-1
6.1.1	Problem Statements	6-2
6.2	Priorities for Water Quality Concerns	6-12
6.2.1	Short-Term Water Quality Action Priorities for EPD	6-12
6.2.2	General Long-Term Priorities for Water Quality Concerns	6-13
6.3	Priorities for Water Quantity Concerns	6-13
6.3.1	Priorities for Competing Demands	6-14
6.3.2	Regional Water Supply Options	6-15

Section 7

	Implementation Strategies	7-1
7.1	“Big Picture” Overview for the Savannah River Basin	7-1
7.1.1	Water Quality Overview	7-2
7.1.2	Water Quantity Overview	7-5
7.2	General Basinwide Management Strategies	7-5
7.2.1	General Surface Water Protection Strategies	7-6
7.2.2	Management of Permitted Point Sources	7-8
7.2.3	Nonpoint Source Management	7-11
7.2.4	Floodplain Management	7-15
7.2.5	Wetland Management Strategies	7-16
7.2.6	Stakeholder Involvement/Stewardship Strategies	7-17
7.2.7	Ground Water Protection Strategies	7-19
7.3	Targeted Management Strategies	7-21
7.3.1	Metals and Toxicity	7-21
7.3.2	Fecal Coliform Bacteria	7-25
7.3.3	Erosion and Sedimentation	7-31
7.3.4	Fish Consumption Guidelines	7-40
7.3.5	Dissolved Oxygen	7-43
7.3.6	Thermal Regime in Clarkes Hill Lake	7-46
7.3.7	Protection of Threatened and Endangered Species	7-47

7.3.8	Source Water Protection for Drinking Water Sources	7-47
7.3.9	Groundwater Quality and Quantity	7-49
7.3.10	Aquatic Habitat	7-53
	References	7-57

Section 8

	<i>Future Issues and Challenges</i>	8-1
8.1	Where Do We Go From Here?	8-1
8.2	Working to Strengthen Planning and Implementation Capabilities	8-2
8.3	Addressing the Impacts from Continued Population Growth and Land Development	8-4
8.4	The Next Iteration of the Basin Cycle	8-4
8.5	Priorities for Additional Data Collection	8-5
<i>Appendix A:</i>	<i>River Basin Planning Act</i>	A-1
<i>Appendix B:</i>	<i>Georgia Instream Water Quality Standards for All Waters: Toxic Substances</i>	B-1
<i>Appendix C:</i>	<i>Point Source Control Efforts</i>	C-1
<i>Appendix D:</i>	<i>NPDES Permits for Discharges in the Savannah River Basin</i>	D-1
<i>Appendix E:</i>	<i>Support of Designated Uses for Rivers , Streams, and Lakes in the Savannah River Basin, 1996-1997</i>	E-1
<i>Appendix F:</i>	<i>Savannah River Basin Contact Information</i>	F-1

List of Figures

1-1.	The Savannah River Basin	1-3
1-2.	Savannah River Basin Planning Schedule, 1 st Cycle, 1996-2001	1-6
1-3.	Savannah River Basin Planning Schedule, 2 nd Cycle, 2001-2006	1-7
2-1.	Location of the Savannah River Basin	2-2
2-2.	Hydrologic Units and Counties of the Savannah River Basin	2-4
2-3.	Major Land Resource Areas in the Savannah River Basin	2-6
2-4.	Hydrography, Savannah River Basin, HUC 03060102	2-9
2-5.	Hydrography, Savannah River Basin, HUC 03060103	2-10
2-6.	Hydrography, Savannah River Basin, HUC 03060104	2-11
2-7.	Hydrography, Savannah River Basin, HUC 03060105	2-12
2-8.	Hydrography, Savannah River Basin, HUC 03060106	2-13
2-9.	Hydrography, Savannah River Basin, HUC 03060108	2-14
2-10.	Hydrography, Savannah River Basin, HUC 03060109	2-15
2-11.	Hydrogeologic Units Underlying the Savannah River Basin	2-17
2-12.	Population Density in the Savannah River Basin, 1990	2-26
2-13.	Land Use, Savannah River Basin, HUC 03060102, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-28
2-14.	Land Use, Savannah River Basin, HUC 03060103, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-29
2-15.	Land Use, Savannah River Basin, HUC 03060104, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-30
2-16.	Land Use, Savannah River Basin, HUC 03060105, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-31
2-17.	Land Use, Savannah River Basin, HUC 03060106, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-32
2-18.	Land Use, Savannah River Basin, HUC 03060108, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-33
2-19.	Land Use, Savannah River Basin, HUC 03060109, USGS 1972-76 Classification Updated with 1990 Urban Areas	2-34
2-20.	Land Cover 1990, Savannah River Basin, HUC 03060102	2-35
2-21.	Land Cover 1990, Savannah River Basin, HUC 03060103	2-36
2-22.	Land Cover 1990, Savannah River Basin, HUC 03060104	2-37
2-23.	Land Cover 1990, Savannah River Basin, HUC 03060105	2-38

2-24.	Land Cover 1990, Savannah River Basin, HUC 03060106	2-39
2-25.	Land Cover 1990, Savannah River Basin, HUC 03060108	2-40
2-26.	Land Cover 1990, Savannah River Basin, HUC 03060109	2-41
2-27.	Silvicultural Land in the Savannah River Basin	2-43
2-28.	Agricultural Land in the Savannah River Basin	2-45
3-1.	Surface Water Intakes, Savannah River Basin, HUC 03060102	3-6
3-2.	Surface Water Intakes, Savannah River Basin, HUC 03060103	3-7
3-3.	Surface Water Intakes, Savannah River Basin, HUC 03060104	3-8
3-4.	Surface Water Intakes, Savannah River Basin, HUC 03060105	3-9
3-5.	Surface Water Intakes, Savannah River Basin, HUC 03060106	3-10
3-6.	Surface Water Intakes, Savannah River Basin, HUC 03060108	3-11
3-7.	Surface Water Intakes, Savannah River Basin, HUC 03060109	3-12
4-1.	Location of Municipal Wastewater Treatment Plants in the Savannah River Basin	4-4
4-2.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060102	4-7
4-3.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060103	4-8
4-4.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060104	4-9
4-5.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060105	4-10
4-6.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060106	4-11
4-7.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060108	4-12
4-8.	NPDES Sites Permitted by GAEPD, Savannah River Basin, HUC 03060109	4-13
4-9.	Land Application Systems, Savannah River Basin, HUC 03060102	4-16
4-10.	Land Application Systems, Savannah River Basin, HUC 03060103	4-17
4-11.	Land Application Systems, Savannah River Basin, HUC 03060104	4-18
4-12.	Land Application Systems, Savannah River Basin, HUC 03060105	4-19
4-13.	Land Application Systems, Savannah River Basin, HUC 03060106	4-20
4-14.	Land Application Systems, Savannah River Basin, HUC 03060108	4-21
4-15.	Land Application Systems, Savannah River Basin, HUC 03060109	4-22
4-16.	Landfills, Savannah River Basin, HUC 03060102	4-24
4-17.	Landfills, Savannah River Basin, HUC 03060103	4-25
4-18.	Landfills, Savannah River Basin, HUC 03060104	4-26
4-19.	Landfills, Savannah River Basin, HUC 03060105	4-27
4-20.	Landfills, Savannah River Basin, HUC 03060106	4-28
4-21.	Landfills, Savannah River Basin, HUC 03060108	4-29

4-22.	Landfills, Savannah River Basin, HUC 03060109	4-30
4-23.	Phosphorus Concentrations, Savannah River near Clyo	4-40
4-24.	Phosphorus Concentrations, Savannah River below Spirit Creek	4-40
4-25.	Dissolved Oxygen Concentrations, Savannah River near Clyo	4-41
4-26.	Dissolved Oxygen Concentrations, Savannah River below Spirit Creek	4-41
4-27.	Fecal Coliform Bacteria Concentrations (MPN/100 ml), Savannah River near Clyo	4-42
4-28.	Fecal Coliform Bacteria Concentrations (MPN/100 ml), Savannah River below Spirit Creek	4-42
5-1.	Savannah River Basin Fixed Sampling Station Locations	5-12
5-2.	Savannah River Basin Trend Monitoring Network Station Locations	5-13
5-3.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060102 . . .	5-19
5-4.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060103 . . .	5-20
5-5.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060104 . . .	5-21
5-6.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060105 . . .	5-22
5-7.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060106 . . .	5-23
5-8.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060108 . . .	5-24
5-9.	Assessment of Water Quality Use Support in the Savannah River Basin, HUC 03060109 . . .	5-25

List of Tables

1-1.	Savannah River Basin Local Advisory Committee Members	1-8
2-1.	Hydrologic Unit Codes (HUCs) of the Savannah River Basin in Georgia	2-3
2-2.	List of Fishes Captured in fisheries Surveys of Savannah River Tributaries in Association with FERC Relicensing (Georgia Power, 1990) and From GA DNR Fish Surveys	2-21
2-3.	Creel Statistics for the Savannah River Tributary Reservoirs Located in Georgia and for Lake Hartwell	2-22
2-4.	Physical Characteristics of Savannah River Tributary Reservoirs in Georgia and for Lake Hartwell	2-24
2-5.	Land Cover Statistics for the Savannah River Basin	2-42
2-6.	Forestry Acreage in the Savannah River Basin	2-44
2-7.	Agricultural Operations in the Savannah River Basin	2-46
2-8.	Georgia Counties in the Savannah River Basin	2-46
2-9.	Georgia Municipalities in the Savannah River Basin	2-47
2-10.	Regional Development Centers in the Savannah River Basin	2-48
2-11.	Georgia Water Use Classifications and Instream Water Quality Standards for Each Use	2-48
2-12.	Savannah River Basin Waters Classified in Georgia Regulations	2-49
2-13.	Savannah River Basin Waters Designated as Trout Streams	2-50
3-1.	Community Public Water Systems in the Savannah River Basin	3-3
3-2.	Permits for Surface Water Withdrawals in the Savannah River Basin	3-14
3-3.	Irrigated Acres in the Savannah River Basin, 1974-1995	3-15
3-4.	Historical Agricultural Water Use in the Savannah River Basin, 1980-1995	3-16
3-5.	Projected Water Use in the Savannah River Basin, 1995-2020	3-16
3-6.	Permits for Surface Water Withdrawals in the Savannah River Basin	3-21
4-1.	Major Municipal Wastewater Treatment Plant Discharges with Permitted Monthly Average Flows Greater than 1 MGD in the Savannah River Basin	4-3
4-2.	Summary of NPDES Permits in the Savannah River Basin	4-5
4-3.	Major Industrial and Federal Wastewater Treatment Facilities in the Savannah River Basin ..	4-6
4-4.	Wastewater Land Application Systems in the Savannah River Basin	4-15
4-5.	Estimated Loads from Agricultural Lands by County	4-32

4-6.	Waters Identified as Potentially Impacted by Agricultural Nonpoint Source Loading and Added to the Georgia 303(d) List	4-32
5-1.	Known and Potential Raw Water Quality Problems Affecting Drinking Water Supplies in the Savannah Basin	5-3
5-2.	Georgia Water Use Classifications and Instream Water Quality Standards for Each Use	5-9
5-3.	Georgia Narrative Water Quality Standards for All Waters	5-9
5-4.	Major Lakes in the Savannah River Basin Ranked by Sum of Trophic State Index Values, 1980-1993	5-14
5-5.	Parameters for Fish Tissue Testing	5-15
6-1.	Summary of Concerns in the Savannah River Basin	6-3
6-2.	Summary of Sources of Lack of Full Support for Classified Uses in the Savannah River Basin	6-4
6-3.	EPD's Short-Term Priorities for Addressing Water Quality Impairment	6-12

List of Acronyms and Abbreviations

Ac	acre
Ac-ft	acre-feet
ACCG	Association of County Commissioners of Georgia
ACF	Apalachicola-Chattahoochee-Flint Basin
ACT/ACF	Alabama-Coosa-Tallapoosa/Apalachicola-Chattahoochee Flint Basin
ADEM	Alabama Department of Environmental Management
AF&PA	American Forest and Paper Association
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
CAFO	confined animal feeding operation
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
CRS	Community Rating System
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
DHR	Georgia Department of Human Resources
DNR	Georgia Department of Natural Resources
DO	dissolved oxygen
DOT	Georgia Department of Transportation
DWP	Drinking Water Program
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
GMA	Georgia Municipal Association
GPC	Georgia Power Company
GPD	gallons per day
gpf	gallons per flush
GPM	gallons per minute
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 underground storage tank
LWG	local work groups
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
MLRA	major land resource area
MOA	memorandum of agreement
MOU	memorandum of understanding
MPN	most probable number (for quantification of fecal coliform bacteria)
MSA	Metropolitan Statistic Area
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
NSBLD	New Savannah Bluff Lock and Dam
NURE	National Uranium Resource Evaluation
NWI	National Wetlands Inventory (USF&WS)
Pb	lead
PCB	polychlorinated biphenyl
PFA	public fishing area
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)
SMZs	Streamside Management Zones
SOCs	Synthetic Organic Chemicals
SRBA	Savannah River below Augusta
SRS	Savannah River Site
STATSGO	State Soil Geographic Database (USDA)
SWAP	source water assessment program
SWCD	Soil and Water Conservation District
SWPP	source water protection program
TAC	technical advisory committees
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
USEPA	U.S. Environmental Protection Agency
USF&WS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USFS	U.S. Forest Service
WET	whole effluent toxicity
WHIP	Wildlife Habitat Incentives Program
WMA	Wildlife Management Areas
WPCA	Water Pollution Control Agency
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 Savannah 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 Savannah River basin, describe the status of water quality and quantity in the Savannah 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 Savannah River Basin Management Plan includes strategies to address a number of different basinwide objectives. These include:

- Protecting water quality in lakes, rivers, streams, estuaries, and coastal waters 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 Savannah River basin over the next five years. It contains useful information on the health of the Savannah River basin and recommended strategies to protect the basin now and into the future.



Savannah River Basin Characteristics

The Savannah River basin is located in eastern Georgia where its headwaters originate in the Blue Ridge Province of Georgia, and North and South Carolinas (Figure 2-1). The basin parallels the Georgia and South Carolina border passing through the Piedmont Province and upper and lower Coastal Plains before reaching the Atlantic Ocean. The Savannah River defines the state boundary between Georgia and South Carolina and the river basin is shared with North and South Carolina. The Savannah River basin has an area of 10,577 square miles in which 175 square miles are in southwestern North Carolina, 4,581 square miles are in western South Carolina, and 5,821 square miles are in eastern Georgia.

Water Resources

The surface water resources of the basin are divided into major watersheds or hydrologic units: the Tugaloo River, Upper Savannah River, Broad River, Little River, Middle Savannah River, Brier Creek and Lower Savannah River. There are a number of major reservoirs in the Savannah River Basin in Georgia including the U. S. Army Corps of Engineer reservoirs Hartwell, Richard B. Russell and Clarks Hill and the Georgia Power reservoirs including, Burton, Rabun, and Tugaloo.

Biological Resources

The Savannah River Basin encompasses parts of five major land resource areas (Blue Ridge, Southern Piedmont, Carolina and Georgia Sand Hills, Southern Coastal Plain, and the Atlantic Coast Flatwoods) providing many different ecosystem types. These ecosystems provide habitat for diverse species of aquatic and terrestrial wildlife. Several of the species are currently threatened or endangered.

Population and Land Use Characteristics

More than 523,100 people live in the Savannah River basin. The major population centers include the Cities of Augusta and Savannah. By the year 2050 predictions indicate an increase in population by approximately 60% to 900,000 people.

More than 55 percent of the basin is covered by forests and forestry-related activities account for a major part of the basin's economy. Agriculture is also a significant land use activity supporting a variety of animal operations and commodity production. In general, animal operations are concentrated north of the Fall line and commodity production is concentrated south of the Fall Line. Although the total farmland is declining in the basin livestock and poultry operations are relatively intense in the Savannah River Basin.

Local Governments and Planning Authorities

The local governments in the basin consist of counties and incorporated municipalities. The Savannah basin includes part or all of 27 Georgia counties. These counties are members of four different Regional Development Centers. There are also 98 incorporated municipalities in the basin.

Water Quantity Conditions

Surface water supplies in the basin include water in rivers, ponds, and reservoirs. Surface water is the primary water source in the Piedmont Province of the Savannah River basin. Within the Coastal Plain Province, aquifer yields are higher and groundwater withdrawals are an important part of the total water budget. The Savannah River provides drinking water for nearly 500,000 people by municipal or privately owned public water systems. Georgia's Drinking Water Program oversees 17 community public water systems utilizing surface water and serving 342,410 people and 134 community public water systems utilizing ground water and serving 124,135 people.

The primary demands for water supply in the basin include municipal and industrial use, agricultural use, and recreation. The demand for drinking water is expected to increase in the near future due to average population growth rates. Agricultural water demand in the Savannah River basin is considerable. Future agricultural water demand is expected to increase slightly within the basin.

Water Quality Conditions

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

Significant potential sources of environmental stressors in the basin include point source discharges such as municipal and industrial wastewater, and storm sewers; and nonpoint sources that result from diffuse runoff from urban and rural land uses. Based on EPD's 1998-1999 water quality assessment, nonpoint sources and urban runoff are now the major sources of failure to support designated uses of water bodies in the Savannah River 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 18 permitted major municipal wastewater discharges with flows greater than 1 MGD in the Savannah River basin. There are also 35 minor public discharges. EPD monitors compliance of these permits and takes appropriate enforcement action for violations. As of the 1998-1999 water quality assessment, 7 stream segments (totaling 36 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 13 major industrial or Federal wastewater dischargers in the basin and 58 minor industrial dischargers. EPD identified one stream segment (14 miles) where a permitted industrial discharger contributed to a failure to support designated uses. This segment is currently being addressed through the NPDES permitting process.

Permitted storm water discharges. Urban storm water runoff in the Savannah basin has been identified as a source of water quality impairment. Urban runoff which is collected by storm sewers is now subject to NPDES permitting and control. EPD has issued stormwater permits to the Cities of Augusta and Savannah.

Nonpoint Sources

Nonpoint sources of pollution include a variety of pollutants that are carried across the ground with rainwater and are deposited in water bodies. The 1998-1999 water quality assessment results for the Savannah 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 stormwater 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. EPD assessed the streams and estuaries in the Savannah basin and reported the results in *the Georgia 2000 305(b)/303(d) List*. This assessment indicated that 36 out of 86 stream segments (271 miles) supported uses, and 24 out of 86 (365 miles) partially supported uses, while 26 out of 86 (186 miles) did not support designated uses.

Key Environmental Stressors

The major threats to water quality in the Savannah River basin are summarized below. The 1998-1999 assessment indicates that listings due to exceedences of water quality

standards for fecal coliform bacteria and dissolved oxygen and for fish consumption guidelines were the most commonly listed causes of failure to support designated uses.

Fecal coliform bacteria. Fecal coliform bacteria concentrations contributed to lack of full support on 216 miles, constituting 36 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 in the basin, nonpoint sources have become increasingly important as potential sources of fecal coliform bacteria.

Fish tissue contamination. Fish consumption guidelines for individual fish species are in effect for 9 stream segments (258 miles). The majority of the guidelines for stream segments are the result of mercury. Most of the mercury load is believed to be of natural and atmospheric origin.

Dissolved oxygen. Dissolved oxygen standards were not met in nine streams representing approximately 37 stream miles. A variety of issues contributed to lowered dissolved oxygen concentrations in streams including dams, municipal wastewater treatment plant discharges and nonpoint sources.

Metals. The 1998-1999 water quality assessments indicate few violations of water quality standards for metals. Metals concentrations contributed to lack of full support on four stream segments representing approximately 22 stream miles. The metals are attributed to municipal wastewater treatment plant discharges.

Nutrient loading. Nutrient loading is potentially an important issue in the Savannah River basin. Excess nutrient loads can promote undesirable growth of algae and degradation of water quality. An estuary receives unassimilated nutrients from the watershed upstream. The major sources of nutrient loading in the Savannah basin are agricultural runoff, urban runoff, storm water, and wastewater treatment facilities.

Flow and Temperature Modification. Stream flow and temperature affect the kinds of organisms able to survive in the water body. Stream flow and temperature also affect how much oxygen is available to the organisms. The potential threats to temperature regime in streams of the Ogeechee 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. One major cause of disturbance to stream habitats is erosion and sedimentation. As sediment is carried into the stream, it can change the stream bottom, and may smother sensitive organisms. Turbidity associated with sediment loading may potentially impair 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 Savannah basin, and there are no major new water supply projects proposed. There are, however, several water quantity concerns in the Ogeechee basin which are of significance to decision makers.

Strategies for Water Quality

Water quality in the Savannah 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 Savannah 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 Savannah 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, lakes and estuaries in the Savannah 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 Savannah 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 standard within a two year period, 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 Savannah basin is drawn from surface water. To provide for the protection of public water supplies, Georgia EPD is developing a Source Water Assessment Program in

alignment with the 1996 amendments to the Safe Drinking Water Act and corresponding recent EPA initiatives.

- **Fish Consumption Guidelines.** EPD and the Wildlife Resources Division work to protect public health by testing fish tissue and issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Key Actions by Resource Management Agencies. Nonpoint source pollution from agriculture and forestry activities in Georgia is managed and controlled with a statewide non-regulatory approach. This approach is based on cooperative partnerships with various agencies and a variety of programs. Agriculture in the Savannah 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 Savannah basin and commercial forest lands represent over 69 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 Savannah River Basin

This basin plan represents one step in managing the water resources in the Savannah 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 Savannah River basin team and local advisory committee will both be reorganized in late 2001 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 Savannah River basin plan is planned for late 2005.