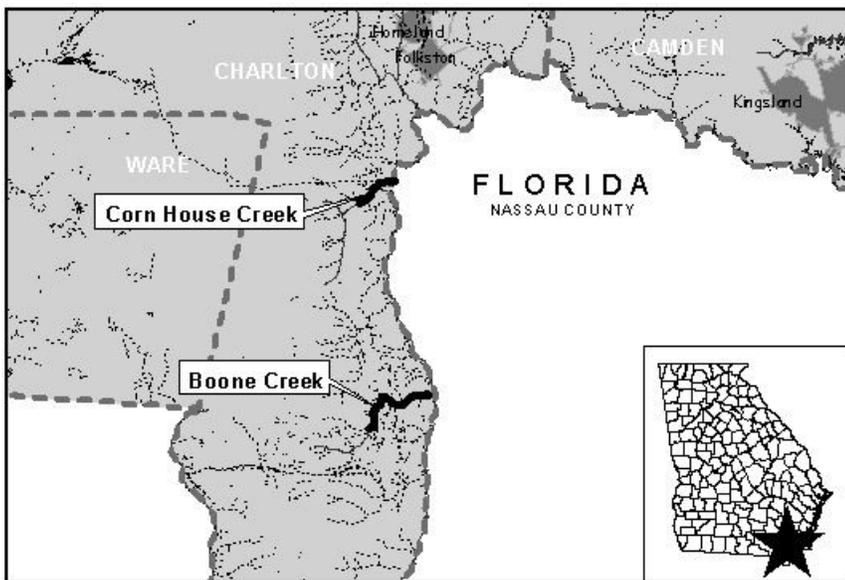


**STATE OF GEORGIA**  
**TOTAL MAXIMUM DAILY LOAD IMPLEMENTATION PLAN**  
**DISSOLVED OXYGEN – 0% REDUCTION REQUIRED**

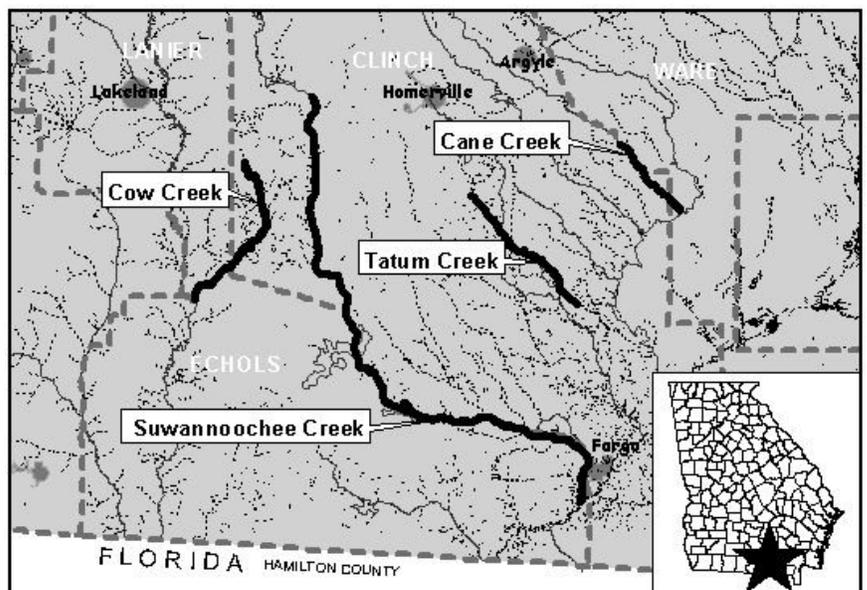
Prepared by  
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**Environmental Protection Division**  
**Atlanta, GA**

TMDL Implementation Plans are platforms for establishing a course of action to restore and maintain the quality of impaired water bodies in a watershed. They are intended as a continuing process that may be revised as new conditions and information warrant. Procedures will be developed to track and evaluate the implementation of the management practices and activities identified in the plans. Once restored, appropriate management practices and activities will be continued to maintain the water bodies.

**Saint Mary's River Basin**



**Suwannee River Basin**



## INTRODUCTION

The Saint Mary's River Basin is predominantly forested and wetland areas with a large wetland contribution from the Okefenokee Swamp in the northwestern portion and the St. Mary's River Estuary in the northeastern portion of the basin. In the Suwannee River Basin the headwaters of the Suwannee River are in the Okefenokee National Wildlife Refuge. Cropland, pasture, urban (or built up) and wetland areas are all identified in the both the Saint Mary's and Suwannee River Basins.

Concluded to be impaired due to low dissolved oxygen levels, seven stream segments in the Saint Mary's and Suwannee River Basins (Table 1.) were classified on the Georgia EPD 2000 303 (d) List as not-supporting or partially supporting for fishing use. TMDL calculations for dissolved oxygen in these water bodies were established using a dynamic receiving water model and a dynamic watershed model.

The TMDL analysis takes into account point (WLA) and nonpoint (LA) sources, watershed segmentation, simulation periods, meteorological data and seasonal variations as well as land use, hydrologic, water quality and leaf litterfall representations. In addition, the TMDL development process implicitly incorporates a margin of safety (MOS) that employs conservative model assumptions/values for input into load allocations.

$$\text{TMDL Formula: } \sum WLA_i + \sum LA_i + \text{MOS} = \text{TMDL}$$

**Table 1.**

Impaired Water Body	Impaired Stream Location	Size	County	EPD 303 (d)	Pollutant Source	Natural DO	TMDL Date	River Basin
1. Boone Creek	Upstream St. Mary's River	6 miles	Charlton	NS	NP	2.50 mg/L	12/2001	St. Mary's
2. Corn House Creek	Upstream St. Mary's River	7 miles	Charlton	NS	NP	3.35 mg/L	12/2001	St. Mary's
3. Cane Creek	Rooty Branch to Okefenokee Swamp near Homerville	6 miles	Clinch	NS	NP	2.16 mg/L	12/2001	Suwannee
4. Cow Creek	Headwaters to Alapaha River	14 miles	Clinch Lanier Echols	PS	NP	4.09 mg/L	12/2001	Suwannee
5. Suwannoochee Creek	Bear Branch to Lee's Bay	30 miles	Clinch	NS	NP	1.92 mg/L	12/2001	Suwannee
6. Suwannoochee Creek	Lee's Bay to Suwannee River	11 miles	Clinch	NS	NP	1.63 mg/L	12/2001	Suwannee
7. Tatum Creek	Tower Rd. to Jones Cr.	9 miles	Clinch	NS	NP	1.28 mg/L	12/2001	Suwannee

**NS=Not-supporting; PS=Partially Supporting; NP=Nonpoint**

## DISCUSSION OF DISSOLVED OXYGEN IMPAIRMENT

Naturally occurring low levels of dissolved oxygen are often the result of high organic (leaf litterfall, decomposing plants) loading, slow flows (due to minimum topographical relief) and elevated temperatures in a surface water system.

Certain waters of Georgia may have conditions where the dissolved oxygen is naturally lower and cannot meet the numeric criteria unless reductions in the natural nutrient and carbon loads are obtained. Since a reduction in natural forest or wetland contributions is not feasible, practicable or desirable, the EPA Dissolved Oxygen Criteria was instituted to identify target limits for TMDLs.

TMDLs for the stream segments listed above state that no load reductions are needed to meet water quality standards for dissolved oxygen based on the following applicable water quality criteria:

- *Numeric* - A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for waters supporting warm water species of fish. 391-3-6-.03 (c) (1)
- *Natural Water Quality* - It is recognized that certain natural waters of the State may have a quality that will not be within the general or specific requirements contained herein. This is especially the case for the criteria for dissolved oxygen, temperature, pH and fecal coliform. NPDES permits and best management practices will be the primary mechanisms for ensuring that the discharges will not create a harmful situation.” 391-3-6-.03(7) GAEPD, 1999
- *U.S. EPA guidelines supplement the Georgia guidelines for naturally low dissolved oxygen conditions by providing numeric targets* - “Where natural conditions alone create dissolved oxygen concentrations less than 110 percent of the applicable criteria means or minima or both, the minimum acceptable concentration is 90 percent of the natural concentration.” Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Freshwater), EPA440/5-86-003, April 1986.

## **POLLUTANT SOURCES**

Since the TMDLs showed no predicted violations of the water quality standards for dissolved oxygen in the seven streams listed above, no load reductions from point sources or nonpoint sources are indicated.

### **Point Sources (Waste Load Allocations)**

Point sources of pollution are defined as direct discharges of organic or inorganic oxidizable substances into a water body, such as discharges associated with wastewater treatment plants, industrial facilities, combined sewer overflows, sanitary sewer overflows and storm water runoff.

Waste Load Allocations (WLA) for point source discharges may be modified by GAEPD during the permitting process. TMDLs will be used to assess permit renewals for facilities discharging into the stream segments listed below. GAEPD will use best efforts to ensure that NPDES permits issued are consistent with the dissolved oxygen TMDL for the listed water bodies and the NPDES Reasonable Potential Procedures.

#### *Savannah River Basin-*

- Unnamed tributary of Cane Creek: Magnolia Plantation – Permit # GA0033928
- Drainage ditch to Tatum Creek: Homerville Industrial Park WPCP – Permit # GA0037460

Permitted discharges will be regulated through the NPDES permitting process described in this plan.

### **Nonpoint Sources (Load Allocations)**

The most significant nonpoint sources are those associated with precipitation, wash off and erosion, which can move pollutants from the land surface into nearby water bodies. Rural, urban and natural land uses can contribute significant amounts of nonpoint pollution:

- Rural: Agricultural fertilizer and manure application runoff, sediment erosion, concentrated animal operations runoff.
- Urban: Surface storm runoff, failing septic systems, sanitary sewer system leakage and overflows.
- Natural: Organic materials contributing to naturally low dissolved oxygen from adjacent wetland/swampy areas, direct and lateral leaf litterfall.

In addition to the aforementioned nonpoint sources of oxygen demanding substances, many southern Georgia streams receive significant contributions of oxygen demanding organic materials from local wetlands and forested stream corridors. In particular, the following sources of organic materials have been identified:

- Adjacent wetland/swampy areas that have organically rich bottom sediments
- Direct leaf litterfall onto the water surface from overhanging trees and vegetation
- Lateral leaf litterfall that has fallen into the floodplains

## **PLAN FOR IMPLEMENTATION OF TMDL**

The minimum daily average dissolved oxygen concentration observed during the critical summer period in the Saint Mary's and Suwannee River Basins was compared to the water quality standards. The resultant in-stream dissolved oxygen concentrations represented natural conditions. The range of values was representative of naturally low dissolved oxygen concentrations and was below 110% of the state water quality standards; therefore the EPA Dissolved Oxygen Criteria was instituted and dissolved oxygen target limits were identified for TMDL development.

Water bodies that do not violate water quality standards will continue to benefit from appropriate management practices and activities to maintain their water quality. The best management practices (BMPs) proposed for impaired streams requiring load reductions in the Saint Mary's and Suwannee River Basins will be extended to reduce anthropogenic loadings from both urban and rural nonpoint sources and to maintain water quality standards in the above listed stream segments.

Georgia EPD and/or other agencies will address the impairment scenario represented by naturally low concentrations of dissolved oxygen with state-level controls and management measures. EPD will also encourage local governments and stakeholders to continue implementing management practices and activities that are already in place, including watershed assessments of pollutant sources and controls as well as water quality sampling and monitoring.

## **MONITORING PLAN**

The above listed stream segments will be sampled again within a five-year monitoring cycle by GAEPD to confirm whether the TMDL results continue to be accurate. It should be noted that core sampling stations in both river basins are monitored each year.

Monitoring Cycles:

2003 – Saint Mary's River Basin

2003 – Suwannee River Basin

In 1998 there were 79 monitoring stations established and sampled in the two river basins listed. The data was used to assess compliance with water quality standards and the assessment results were used by GAEPD in the development of the 2000-303(d) list.

- Ten (10) of the sampling stations are in the Saint Mary's River Basin
- Sixty-nine (69) of the sampling stations are in the Suwannee River Basin

## **EDUCATION/OUTREACH ACTIVITIES**

An education/outreach component will be used to enhance public understanding of and participation in implementing water quality management plans for all 303(d) listed water bodies in the Saint Mary's and Suwannee River Basins. GAEPD will continue to identify and notify local governments (counties, cities, municipalities) about all the 303 (d) listed impaired water bodies within their jurisdictions.

Local governments, businesses and water conservation groups will develop effective educational outreach activities to promote public awareness of local water quality issues. Georgia EPD will work with the Natural Resource Conservation Service (NRCS), the Georgia Soil and Water Conservation Commission (GSWCC), and the Georgia Forestry Commission as well as wetland and agricultural management agencies to conduct training in best management practices (BMP) that will reduce anthropogenic nonpoint source loadings in the impaired streams listed in the Saint Mary's and Suwannee River Basins.

## **STAKEHOLDERS**

EPD encourages public involvement and the active participation of stakeholders in the process of improving water quality. Stakeholders can provide valuable insight, information and data regarding their local watersheds and/or can implement management measures.

Local governments, businesses and organizations impacted by impaired water bodies that require load reductions to improve dissolved oxygen measurements in the Saint Mary's and Suwannee River Basins have been identified as stakeholders in maintaining water quality standards in the above-listed stream segments:

### Saint Mary's River Basin

- Charlton County
- Cities of Folkston and Homeland
- Southeast Georgia Regional Development Center
- Seven Rivers Resource Conservation and Development Council
- Natural Resource Conservation Service (NRCS)
- Coastal Georgia Regional Development Center
- DNR Coastal Resources Division
- St. Mary's River Management Committee
- Adopt-A-stream, Marine Sciences Program, Savannah State
- Georgia Forestry Commission
- Gowen Timber Co. Inc.
- Toledo Manufacturing Co.
- International Paper
- The Nature Conservancy

### Suwannee River Basin

- Clinch, Echols, Lanier, Ware Counties
- Cities of Fargo and Homerville
- Upper Suwannee River Watershed Initiative
- Rural Development Center, Tifton
- South Georgia Regional Development Center
- Southeast Georgia Regional Development Center
- Seven Rivers Resource Conservation and Development Council
- Alapaha River Association
- Georgia Soil & Water Conservation Commission
- Natural Resource Conservation Service (NRCS)
- Georgia Forestry Commission
- Georgia Farm Services Agency
- National Environmentally Sound Production Agriculture Laboratory (NESPAL)
- The Watershed Group: The University of Georgia and Carter & Sloope, Inc.