

Carters Lake Chlorophyll *a* TMDL Study

**2008 Field Study Plan
Module 2 Water
Quality Sampling**

**Georgia Department of Natural Resources
Environmental Protection Division
Watershed Protection Branch
Watershed Planning & Monitoring Program
4220 International Parkway Suite 101
Atlanta, Georgia 30354**

Introduction

The primary objective of this module is the collection and analysis of discrete water quality samples at locations on the Upper Coosawattee River basin and tributaries to Carters Lake. The Upper Coosawattee River watershed is composed of twenty 12 digit HUCs (Hydrologic Unit Codes) nested within four 10 digit HUCs. Module 2 has targeted fourteen of the 12 digit HUCs to determine input contributions to the Carters Lake Chlorophyll a TMDL Study. These data will be used to calibrate the watershed model for the Upper Coosawattee River Basin.

Water Quality Sample Collection

The discrete water quality data collection (Fig. 2-1) will extend south from the re-regulation lake at Talking Rock Creek at Highway 136, north on Mountaintown Creek at Sam Hill Road, and east on Tickanety Creek at Macedonia Road. At a minimum, these watershed sites will be sampled twice per month for the period from January 1st through December 31st 2008. Table 2-1 lists all the locations of the water quality sampling sites included in this study. Monthly samples will be collected by the USGS at two locations, the Coosawattee River at Hwy 5 and Mountaintown Creek at Hwy 76.

Additionally, Carters Lake will be sampled monthly, during the growing season from April through October 2008, by EPD personnel at a total of three sites. Two of these sites will collect discrete monitoring data and deploy datasondes for the collection of continuous monitoring data (Module 3) in the main lake and one site will collect discrete monitoring data in the re-regulation lake.

Field Measurements and Laboratory Analyses

Field measurements will be recorded at the time the water samples are collected. These measurements will include dissolved oxygen (DO), water temperature, pH, and specific conductance. Collected water samples will be sent to the laboratory where they will be analyzed for the following parameter list: 5-day biochemical oxygen demand (BOD₅), total Kjeldahl nitrogen (TKN), ammonia nitrogen (NH₃), nitrate-nitrite nitrogen (NO₂-NO₃), total phosphorus, ortho-phosphate (dissolved), total organic carbon (TOC), and turbidity. Tape down or gage height will be measured and recorded at the time of each sample collection.

Lake sampling will also include: Vertical profiles for - pH, DO, temperature, and specific conductance. Lake level (above sea-level) and in-situ depth will be recorded. In addition, the light penetration will be determined using a Li-Cor and a sechi depth will be measured to determine the photic zone, from which a depth composite water sample will be collected and analyzed for chlorophyll a, nutrients (see above), hardness, alkalinity, and total suspended solids (TSS). A fecal coliform

Table 2-1. Location of Water Quality Sampling Sites

Tributary Sites	Location	No. of Site visits	Station ID
Ellijay River	SR 52	24	14056901
Cartecay River	Lower Cartecay Rd	24	14070001
Cartecay River	SR 2	24	14079011
Mountain Town Creek	SR 282 / HWY 76	24	14115001
Tails Creek	SR 282 / HWY 76	24	14116001
Rock Creek	Rock Creek Rd	24	14056301
Ellijay River	Goose Island Rd	24	14056401
Boardtown Creek	Whitepath Rd	24	14056501
Big Turniptown Creek	Northcutt Rd	24	14056701
Kells Creek	Kells Ridge Dr	24	14056821
Royston Creek	Big Creek Rd	24	14064901
Tickanety Creek	Macedonia Rd	24	14063901
Clear Creek	Blackberry Mtn Rd	24	14075511
Coosawattee River	Fife Bridge @ Coosawattee Resort	24	14109931
Mountaintown Creek	CR 64 Sam Hill Rd	24	14114001
Mountaintown Creek	Craigtown Rd	24	14114031
Little Mountaintown Creek	Hidden Valley Trail	24	14114101
Conasauga Creek	Mountaintown Rd	24	14114201
Davis Creek	Mountaintown Rd	24	14114301
Flat Creek	SR 382	24	14119251
Harris Creek	Hwy 382	24	14119261
Talking Rock Creek	Talking Rock Resort	24	14119981
USGS – Mountaintown Creek	SR 282	12	02381090
USGS – Coosawattee River	SR 5	12	02380500

Carters Lake Sites	Location	No. of Site visits	Station ID
Carters Lake	Upper Lake – Cooswattee Arm	7	14119301
Carters Lake	Midlake – Woodring Branch	7	14119401
Carters Lake Re-regulation	Dam pool	7	---

grab sample from the surface will also be collected. Additional, chlorophyll a and ortho-phosphate (dissolved) will be collected for a total of twice a month

Personnel

EPD or USGS personnel will take the field measurements, collect the water samples, and record any flow measurements. Either the Georgia EPD 14th Street Laboratory or the University of Georgia Agricultural and Environmental Sciences Laboratory will analyze samples collected during this study.

Quality Control

EPD will conduct all water quality sampling according to their Quality Assurance Plan. The samples will be analyzed according to the test methods outlined in:

Title 40, Code of Federal Regulations, Part 136.3, (latest revision), United States Federal Register, Office of the Federal Register, National Archives and Records Administration, Washington, D.C., 20001.

All water quality data will be entered and maintained in the Watershed Protection Branch's Water Resources Data-Base (WRDB).

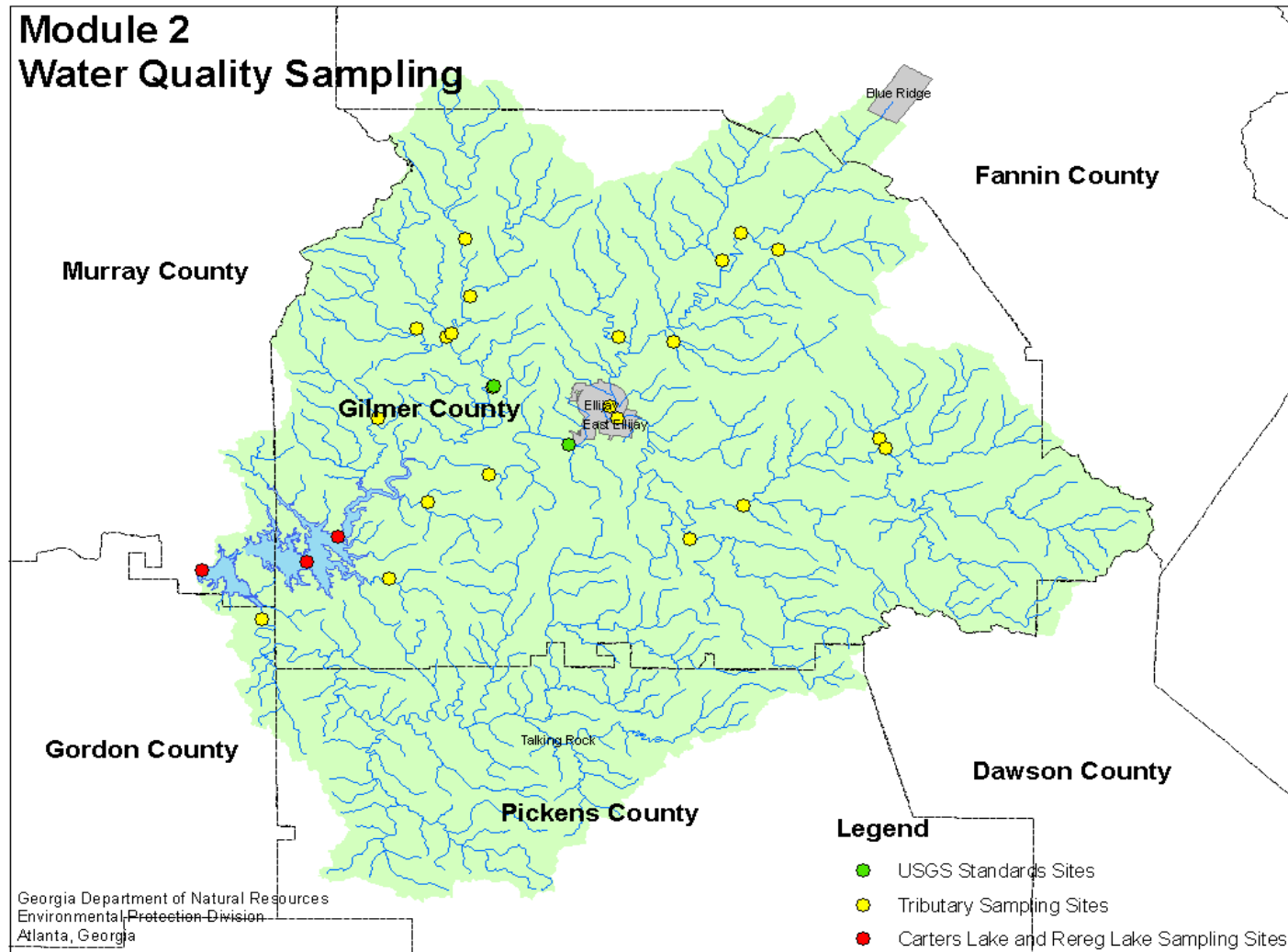


Figure 2-1. Water Quality Sampling Locations for Carters Lake Chlorophyll a TMDL.