Section 5

Assessments

This section provides an evaluation of current conditions in the Chattahoochee River Basin, and includes assessment of both water quantity (Section 5.1) and water quality (Section 5.2) issues. The assessment results are combined with the evaluation of environmental stressors (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 Chattahoochee River Basin are being addressed comprehensively as part of the ACT/ACF study. In that process an Interstate Compact is to be established for the purpose of administering a water allocation formula which will partition the flow of the Chattahoochee and Flint Rivers among Alabama, Florida, 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 in the Chattahoochee River Basin are expected to increase by about 6% between 1995 and 2005, virtually all from surface water sources. By the year 2050, M&I water use is expected to increase only another 16%, largely because industrial use will decrease substantially. Although there will undoubtedly be some problems in meeting these increased demands, given the high priority placed on meeting drinking water needs, meeting these demands should not exceed the availability of raw water sources, especially since approximately 80% of the M&I withdrawals are returned to the river.

Overall the surface water quality in the Chattahoochee River Basin is good for use as drinking water. However, surface water quality problems due to non-point source pollution such as agricultural and storm water runoff are concerns to municipalities which withdraw surface water from the Chattahoochee River and tributaries. The contaminant of most concern is high 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 are needed to settle out the sediment. All public water systems in the state of Georgia that use surface water meet the federal Surface Water Treatment Rules for filtration and treatment.

Overall ground water quality is 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 deeper aquifers, the number of contaminated wells is small. However, in the Chattahoochee Basin some public water system wells have been contaminated by local pollution sources such as leaky underground storage tanks, malfunctioning septic tank systems, and spills. Those wells that exceed the Maximum Contaminant Level (MCL) for a contaminant are either removed from service or added treatment to the system. Also, a few wells in the basin have been found to be under the direct influence of surface water due to the geology of the area in which the well is located. These wells are monitored and have additional treatment requirements.

5.1.2 Agriculture

The water demand for agricultural use in the Chattahoochee 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 Chattahoochee 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 Lanier. Because of the significant recreational use of Lake Lanier, and the tremendous investment in homes and recreation activities around the lake, it is very important that water levels be kept as high as possible, especially in the spring, summer, and early fall. Water level management is as much a function of the way in which the reservoirs are operated as of water availability, however. Should the Corps of Engineers operate the dam in a manner which emphasizes 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 Corps' conservative operational philosophy, when a drought occurs there will likely be a greater chance that water levels will drop below that which supports optimum recreation potential. However, there are significant 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 peaking 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.

5.1.5 Navigation

The Chattahoochee River is navigable upstream to Columbus. Limitations to navigation have historically been associated with the requirement for extensive channel maintenance in the Apalachicola River in Florida. The amount of channel maintenance in the Apalachicola and the amount (and timing) of water to be made available for navigation support will be a subject of the ACF Study and will be part of the considerations involved in establishing a water allocation formula. Late summer and fall are typically the seasons in which water availability is most limited. At these times the Corps is usually only able to provide sufficient water to support navigation during limited time periods (navigation windows). It is unlikely that navigable channel depths will be provided on a full time basis in the future; however, it is hoped that satisfactory navigation channel conditions can be provided in a predictable manner to support Georgia's shipping needs.

Table 5-1. 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.

5.1.6 Waste Assimilation Capacity

Sufficient flow for assimilation of treated wastewater in the Chattahoochee River is most critical in the reach between Atlanta, and West Point Lake. Criteria have been established for minimum stream flow for this purpose at Peachtree Creek. 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, would there be insufficient water to meet instream water quality standards.

5.2 Assessment of Water Quality

This assessment of water quality is generally consistent with Georgia's water quality assessments for CWA Section 305(b) reporting to EPA. 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 sub-basin 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 5-1 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 5-2.

Table 5-2. 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 water body 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...

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. In order to comply with these requirements, in 1989 the Board of Natural Resources adopted 31 numeric standards for 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 USEPA.Georgia is also developing site-specific standards for major lakes where control of nutrient loading is required to prevent problems associated with eutrophication. In September 1995, the Board of Natural Resources adopted lake standards for West Point Lake. Standards were adopted for chlorophyll *a*, pH, total nitrogen, phosphorus, fecal coliform bacteria, dissolved oxygen, and temperature. Site-specific standards have also been adopted for Lake Walter F. George. The adopted standards for West Point Lake and Lake Walter F. George are presented in Table 5-3.

5.2.2 Surface Water Quality Monitoring

EPD 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, to 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 TMDLs. Trend monitoring, intensive surveys, lake, coastal,

Table 5-3. Water Quality Standards for West Point Lake and Lake Walter F. George

(16) Specific Criteria for Lakes and Major Lake Tributaries. In addition to the general criteria, the following lake specific criteria are deemed necessary and shall be required for the specific water usage as shown:

(a) West Point Lake: Those waters impounded by West Point Dam and downstream of US 27 at Franklin.

- (i) Chlorophyll a: For the months of April through October, the average of monthly photic zone composite samples shall not exceed 27 μg/l at the LaGrange Water Intake.
- (ii) pH: within the range of 6.0-9.5.
- (iii) Total Nitrogen: Not to exceed 4.0 mg/l as Nitrogen in the photic zone.
- (iv) Phosphorus: Total lake loading shall not exceed 2.4 pounds per acre foot of lake volume per year.
- (v) Fecal Coliform Bacteria:
  1. US 27 at Franklin to New River: Fecal coliform bacteria shall not exceed the Fishing criterion as presented in 391-3-6-.03(6)(c).
  2. New River to West Point Dam: Fecal coliform bacteria shall not exceed the Recreation criterion as presented in 391-3-6-.03(6)(b).
- (vi) Dissolved Oxygen: A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times at the depth specified in 391-3-6-.03(5)(f).
- (vii) Temperature: Not to exceed 90°F. At no time is the temperature of the receiving waters to be increased more than 5°F above intake temperature.
- (viii) Major Lake Tributaries: For the following tributaries, the annual total phosphorus loading to West Point Lake shall not exceed the following:
  1. Yellow Jacket Creek at Hammet Road: 11,000 pounds.
  2. New River at Hwy. 100: 14,000 pounds.
  3. Chattahoochee River at US 27: 1,400,000 pounds.

(b) Lake Walter F. George: Those waters impounded by Walter F. George Dam and upstream to Georgia Highway 39 near Omaha.

- (i) Chlorophyll a: For the months of April through October, the average of monthly photic zone composite samples shall not exceed 18 µg/l at mid-river at U.S. Highway 82 or 15 µg/l at mid-river in the dam forebay.
- (ii) pH: Within the range of 6.0-9.5 standard units.
- (iii) Total Nitrogen: Not to exceed 3.0 mg/l as nitrogen in the photic zone.
- (iv) Phosphorus: Total lake loading shall not exceed 2.4 pounds per acre-foot of lake volume per year.
- (v) Fecal Coliform:
  1. Georgia Highway 39 to Cowikee Creek: Fecal coliform bacteria shall not exceed the Fishing criterion as presented in 391-3-6-.03(6)(c)(iii).
  2. Cowikee Creek to Walter F. George Dam: Fecal coliform bacteria shall not exceed the Recreation criterion as presented in 391-3-6-.03(6)(b)(I).
- (vi) Dissolved Oxygen: A daily average of no less than 5.0 mg/l and no less than 4.0 mg/l at all times at the depth specified in 391-3-6-.03(5)(f).
- (vii) Temperature: Water temperature shall not exceed the Recreation criterion as presented in 391-3-6-.03(b)(iv).
- (viii) Major Lake Tributary: The annual total phosphorus loading to Lake Walter F. George, monitored at the Chattahoochee River at Georgia Highway 39, shall not exceed 2,000,000 pounds.

biological, fish tissue, and toxic substance monitoring, and facility compliance sampling are the major monitoring tools used by EPD. Each of these is briefly described in the following sections.

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

Today EPD contracts with the United States Geological Survey (USGS) for the majority of the trend sampling work, and with the Columbus Water Works for samples on the Chattahoochee below Columbus. In addition to monthly stream sampling, a portion of the work with the USGS involves continuous monitoring at several locations across the State. An automatic monitor which continuously records dissolved oxygen, temperature, pH and conductivity data is located on the Chattahoochee River downstream of Atlanta.

In addition to work done by cooperative agreements, EPD associates collect samples monthly from locations on the Chattahoochee River between Buford Dam to downstream of Atlanta at Georgia Highway 92. EPD associates also collect water and sediment samples for toxic substance analyses, and macroinvertebrate samples to characterize the biological community at selected locations as a part of the trend monitoring effort. The trend monitoring network in place in the Chattahoochee in 1994 is shown in Figure 5-1.

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.

Figure 5-2 shows the redirected trend monitoring network for 1995. The focus for trend monitoring was in the Chattahoochee and Flint River basins. Statewide trend monitoring was continued at the thirty seven core station locations statewide, in the Savannah Harbor, and at all continuous monitoring locations. The remainder of the trend monitoring resources were devoted to the Chattahoochee and Flint River Basins. In addition to chemical sampling, new work on macroinvertebrate sampling was done as a part of the Chattahoochee/Flint River Basin monitoring work. As a result, more sampling was conducted along the mainstem and in the smaller tributaries of the two 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 as these studies involve intensive monitoring of 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.

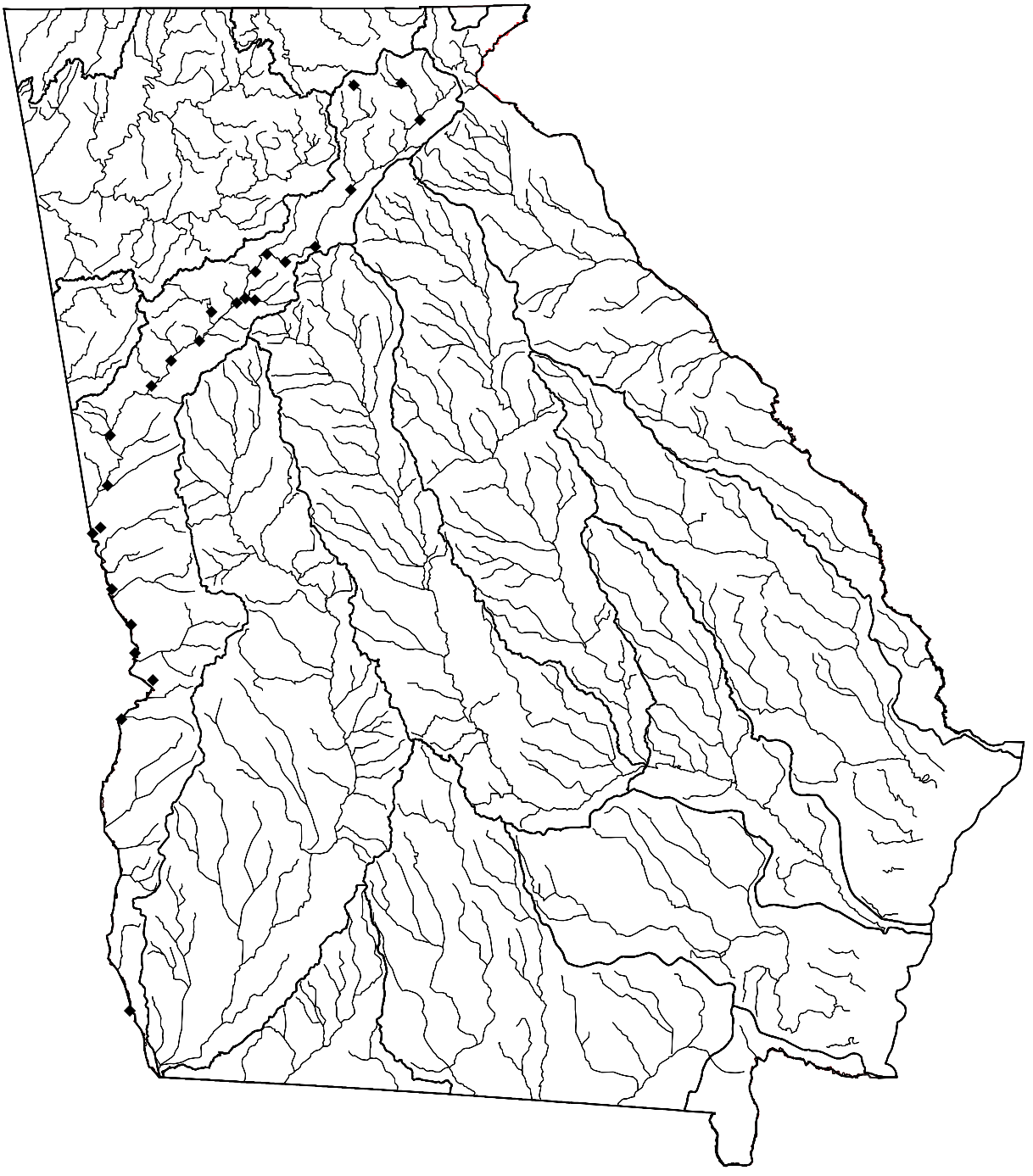

Figure 5-1. Chattahoochee River Basin Trend Monitoring Station Network, 1994

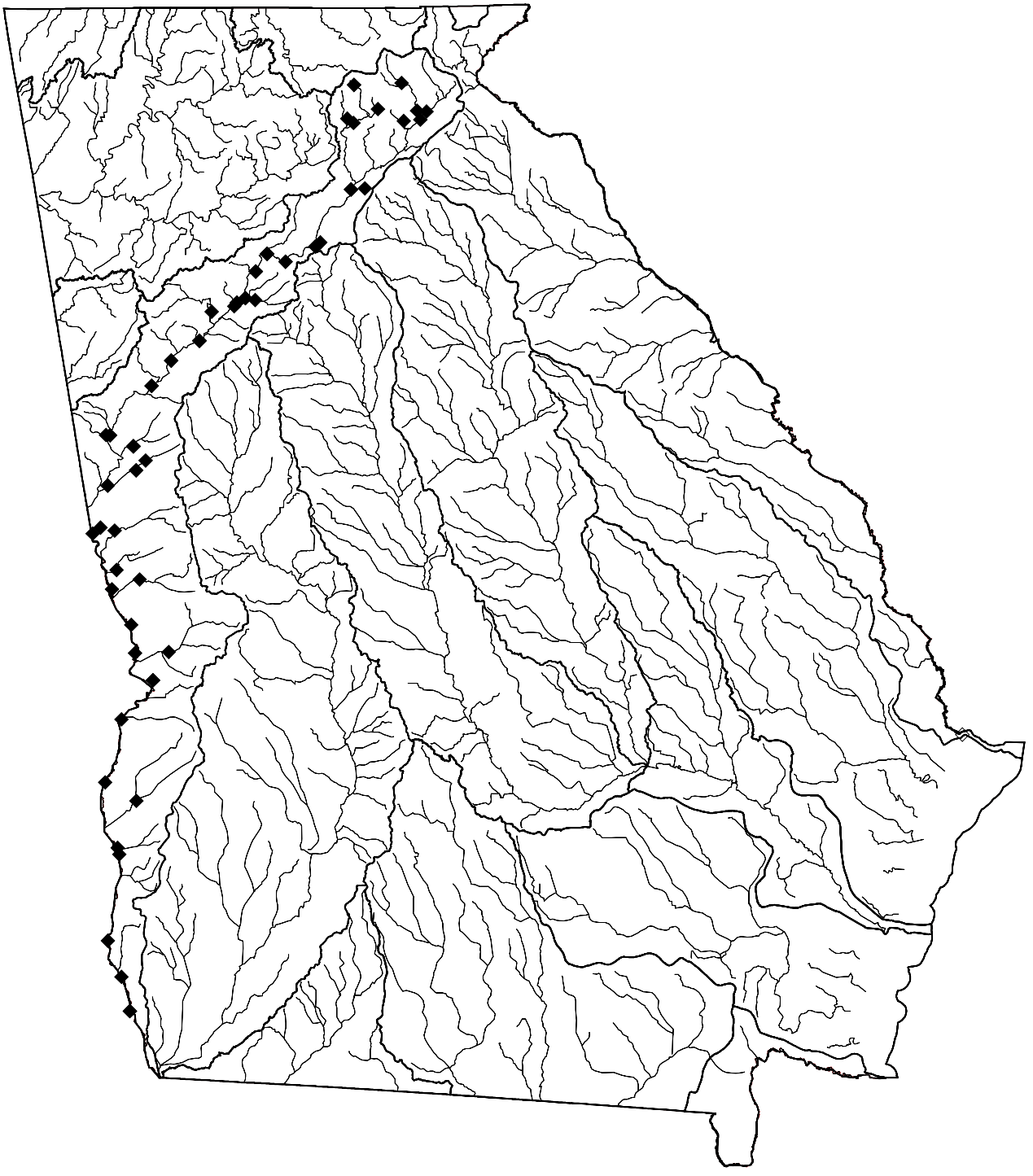

Figure 5-2. Chattahoochee River Basin Trend Monitoring Network Station Locations, 1995

In 1994-1995 intensive survey resources were focused on model calibration studies for the Chattahoochee River Modeling Project (CRMP). The CRMP will provide a time-variable hydrodynamic and water quality model for the main stem of the Chattahoochee River from Buford Dam to the headwaters of West Point Lake at Franklin, Georgia. The model will be a general-purpose model, capable of supporting regulatory decision making for a variety of water resource and water quality management issues into the 21st century. The study area is shown in Figure 5-3.

The CRMP project is being coordinated in three phases. Phase I focused on project planning and implementation and covered the period from January 1993 to May 1994. Phase II included field data collection and involved work performed during 1993-1996. Phase III comprises all model development activities including software development and testing, data handling and processing, main stem model calibration and verification, critical conditions assessment , and model preparation for critical period decision making. Phase III began in late 1994, continues to present, and should be essentially complete in 1998.

A companion effort, called the Chattahoochee Stormwater Project, began in April 1994 to develop lumped stormwater management models (SWMM models) for forty-seven tributary watersheds (Figure 5-3) in the study area. These stormwater models will be used to estimate wet weather loadings to the river during mainstem model calibration and validation. These models will also be used in the future to estimate stormwater impacts on the river during the analysis of specific issues that require regulatory decisions. Results from the Stormwater Project are anticipated during 1997, in time to support model calibration and critical period model development.

Phase I, project planning and implementation was completed in May 1994. The Phase I work was summarized in two reports, *Phase I Final Report, Issue Analysis and Model Selection, May 1994,* and *Field Study Plan, Part I: Purposes and Guiding Principles, February, 1994.* The Phase I report summarized the work done through public participation to identify the major issues to be addressed by the model over the next two decades and the work done to select the model to be used to address the priority issues. The field study plan report summarized the monitoring efforts necessary to collect data for model calibration and verification.

The field work involved multiple intensive survey efforts carried out over six month periods May-October, in 1994 and 1995 and continued in 1996 on a smaller scale. The field work was divided into modules and carried out as individual intensive studies. Modules were established for tributary sampling, centerline river sampling, continuous monitoring, photosynthesis-respiration measurements, time series BOD sampling, water pollution control plant sampling, Chattahoochee River / West Point Lake transition sampling, flow monitoring, temperature monitoring and bottom characterization. For the mainstem river and tributary sampling sites more than 3000 samples have been collected and analyzed in EPD laboratories.

This project has been conducted in partnership, both technically and financially, with other water resource agencies. Partners include the USEPA, the USGS, the local governments in the Atlanta Regional Commission, the National Park Service, the Corps of Engineers, the Waterways Experiment Station, Georgia Power Company, local government water pollution control plants, drinking water and stormwater utility personnel, as well as the multiple agency, environmental group, and individual input that was received during the issue identification work in Phase I of the project.

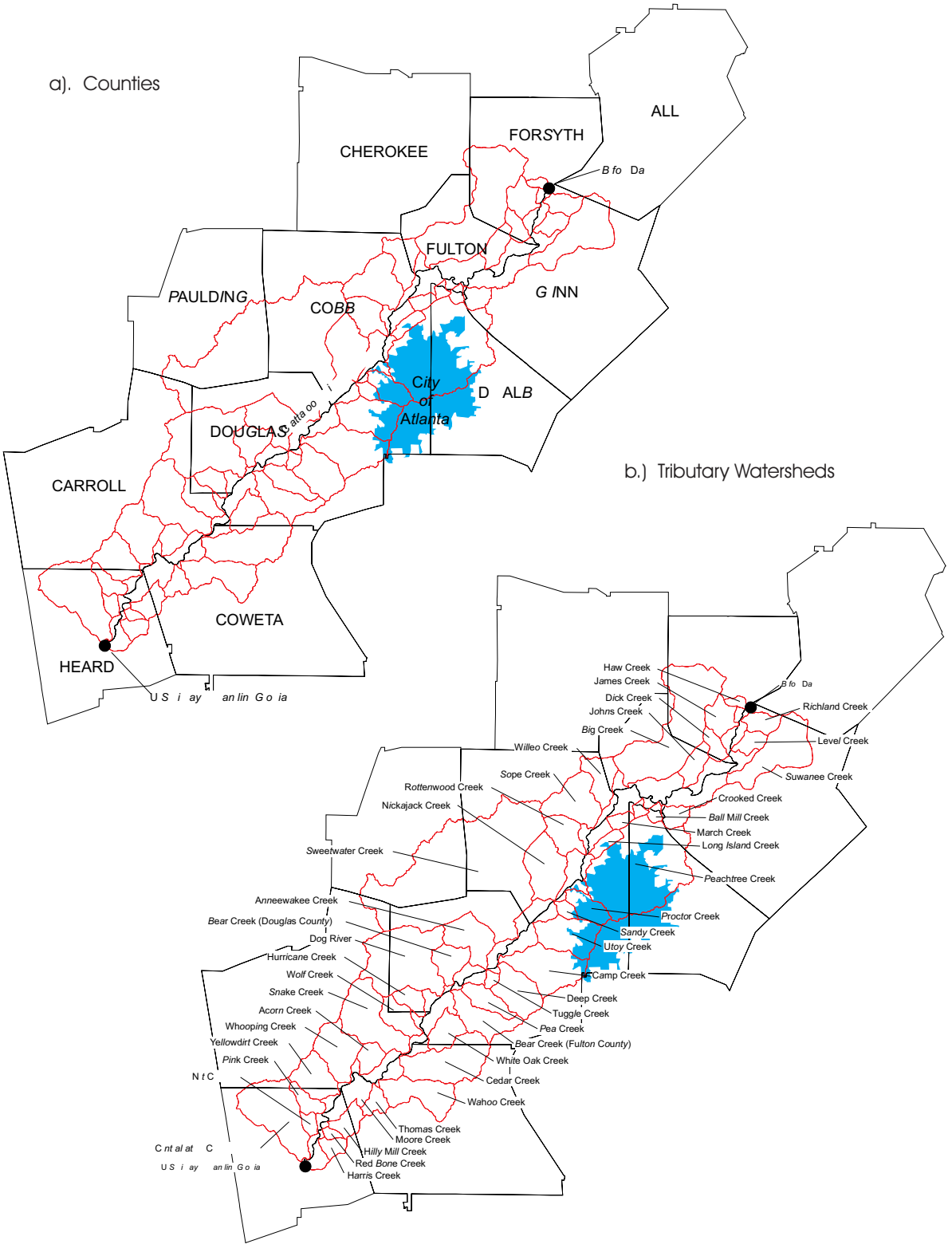

Figure 5-3. The CRMP Study Area

Another important recent special monitoring project was the West Point Lake Study. This work continued the project initiated in the mid-1980s, and continued in the early 1990s as a part of a joint Georgia-Alabama Clean Lakes Phase I Diagnostic-Feasibility Study, to assess water quality conditions in West Point Lake. The project involved water quality sampling and *in situ* data collection from a number of lake stations on a monthly basis during the algal growing season from May-October, 1995. In addition, in 1996 and 1997 EPD associates conducted sampling in West Point Lake and tributaries to provide data for calibration of a mathematical model of the lake. The modeling work will provide an additional tool for assessing conditions in the lake.

Lake Monitoring. EPD has maintained monitoring programs for Georgia's public access lakes for many years. In the late 1960's, lake water quality studies were conducted on Lake Lanier. Also at that time 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 USEPA National Eutrophication Survey which included fourteen 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. Georgia's water quality monitoring network has collected long term data from sites in four major lakes of which three, Lake Lanier, West Point Lake, and Lake Harding, are in the Chattahoochee basin.

In 1980-1981, EPD conducted a statewide survey of public access freshwater lakes. The study was funded in part by USEPA 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, and specific conductance, 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 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 Chattahoochee 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 resulting from the focus on the CRMP work. The work on major lakes in the future will be a part of the River Basin Management Planning process.

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 be possible for the DNR to sample fish from every stream and lake in the state. However, high priority has been placed on the 26 major reservoirs which make up more than 90% of the total lake acreage. These lakes will continue to be sampled as part of the River Basin Management Planning five year rotating schedule to track trends in fish contaminant levels. The DNR has also made

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

1984		1985		1986		1987		1988	
Harding	181	Seminole	184	Harding	177	Harding	184	Harding	178
Seminole	179	Harding	171	Oliver	176	Oliver	177	Seminole	174
Oliver	170	WF George	161	Seminole	175	Seminole	<160	Oliver	171
WF George	168	Oliver	161	WF George	162	West Point	<156	West Point	169
West Point	156	West Point	157	West Point	160	WF George	<151	WF George	168
Lanier	138	Lanier	123	Lanier	128	Lanier	<123	Lanier	<132
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**	
WF George	192	Oliver	177	Harding	185	Seminole	183	Seminole	175
Harding	191	Harding	174	Seminole	181	WF George	181	Harding	170
Oliver	170	Seminole	154	WF George	172	Oliver	168	Oliver	170
Seminole	174	WF George	145	West Point	171	Harding	166	WF George	169
West Point	164	West Point	141	Oliver	157	West Point	163	West Point	163
Lanier	<128	Lanier	126	Lanier	121	Lanier	138	Lanier	122
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.

sampling fish in rivers and streams down-stream of urbanand/or industrial areas a high priority. In addition, DNR will focus attention on areas which are 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 which could create risk to human health from fish consumption.

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

Table 5-5. 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

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, ten to twenty sites per year were sampled as part of this project. During the 1994-1995 period, 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, and an evaluation of the permittee sampling and flow monitoring requirements.

In excess of 350 sampling inspections were conducted by EPD staff statewide in 1994-1995. 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 1995 this work was focused in the Chattahoochee and Flint River basins in support of the River Basin Management Planning process.

Aquatic Toxicity Testing. In 1982 EPD incorporated aquatic toxicity testing in 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. Today, toxicity testing is addressed in all municipal and industrial NPDES permits.

EPD has conducted aquatic toxicity tests on effluents and surface waters since 1985. In 1988, EPD constructed laboratory facilities to support chronic and acute testing capabilities. All toxicity testing is conducted in accordance with appropriate USEPA methods. Over the 1994-1995 period, EPD conducted 106 chronic tests and 19 acute tests on effluents or surface waters. In 1995, priority was given to testing of facility effluents in the Chattahoochee and Flint River basins in accordance with the River Basin Management Planning approach. Test results are used to manage and control the discharge of toxic substances in toxic amounts to the waters of the State. Toxicity testing at the EPD lab will be phased out in July 1997.

5.2.3 Data Analysis

Assessment of Use Support. Water quality data is assessed to determine if standards are met and if the waterbody supports its classified use. If monitoring data shows that standards are not achieved, depending on the frequency standards are not met, the waterbody is said to be not supporting or partially supporting the designated use.

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 list is 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 if:

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

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

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

Additional specific detail is provided in the following paragraphs on 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 thirty day period) of 200 MPN / 100 ml for all waters in Georgia during the recreational season of May- October. This is the year-round standard for waters with the water use classification of recreation. Although the standard is based on a geometric mean, most of the data for Georgia and other states is based on once per month sampling as resources are not available to conduct sampling and analysis four times per month. Thus, for the purposes of this report USEPA 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-April). This standard was used to evaluate data collected during November through April for these waters. Waters were deemed not supporting uses when 25% 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% of the samples were in excess of the review criteria.

Metals. In general, data on metals from any one given site are not frequent. As the data are infrequent, using the general evaluation technique of 25% excursion to indicate nonsupport and 11%-25% excursion to indicate partial support was not meaningful. Streams were placed in the non-supporting 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 is placed beside metals data in those cases where there is a minimal database. A number of stream segments were listed based on one data point exceeding a water quality standard. This is in accordance with USEPA 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 evaluated 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 non-support 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% of the time, the waters were evaluated as not supporting the designated use. Between 11% and 25% non-compliance resulted in a partially supporting evaluation.

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

Biotic Data. A "Biota Impacted" designation for "Criterion Violated" indicates that studies showed a modification of the biotic community. Communities utilized were fish. Studies of fish populations by the DNR Wildlife Resources Division used the Index of Biotic Integrity (IBI) to identify impacted 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 Chattahoochee River Basin. Most of these results were previously provided in the report "Water Quality in Georgia, 1994-1995" (Georgia DNR, 1996). Results are presented by Hydrologic Units. Within some Hydrologic Units, results are further subdivided into natural geographic areas, such as streams above and below Lake Lanier in HUC 03130001. A geographic summary of assessment results is provided by HUC in Figures 5-4 through 5-7.

5.2.4.1 Hydrologic Unit Code 03130001 (Upper Chattahoochee River)

This hydrologic unit covers the headwaters of the Chattahoochee River down to the junction with Peachtree Creek, just northwest of Atlanta, and includes parts of the Blue Ridge and Southern Piedmont Provinces (see Figure 2-5). The hydrologic unit is broken into two segments

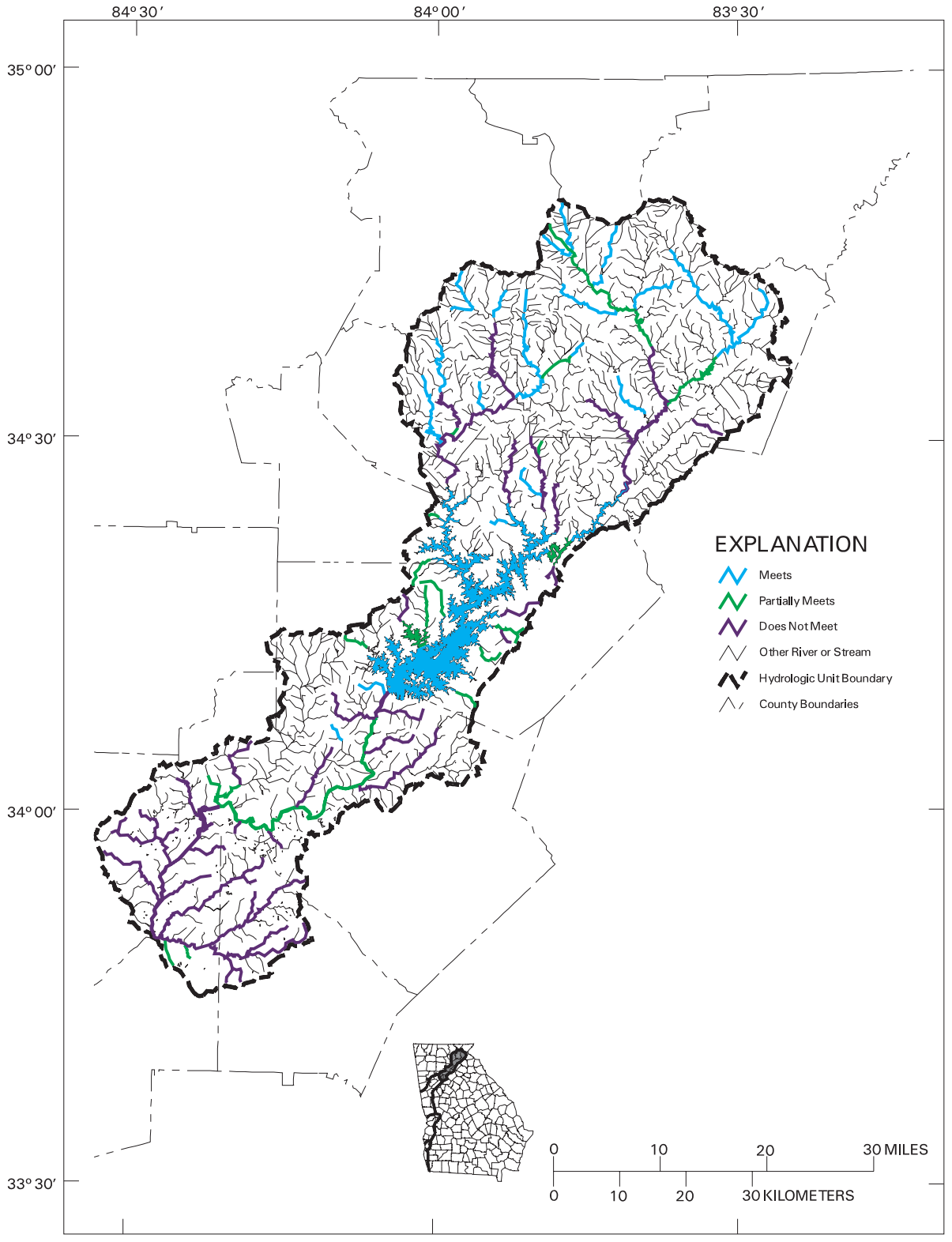

Figure 5-4. Assessment of Water Quality Use Support in the Upper Chattahoochee River Basin, HUC 03130001

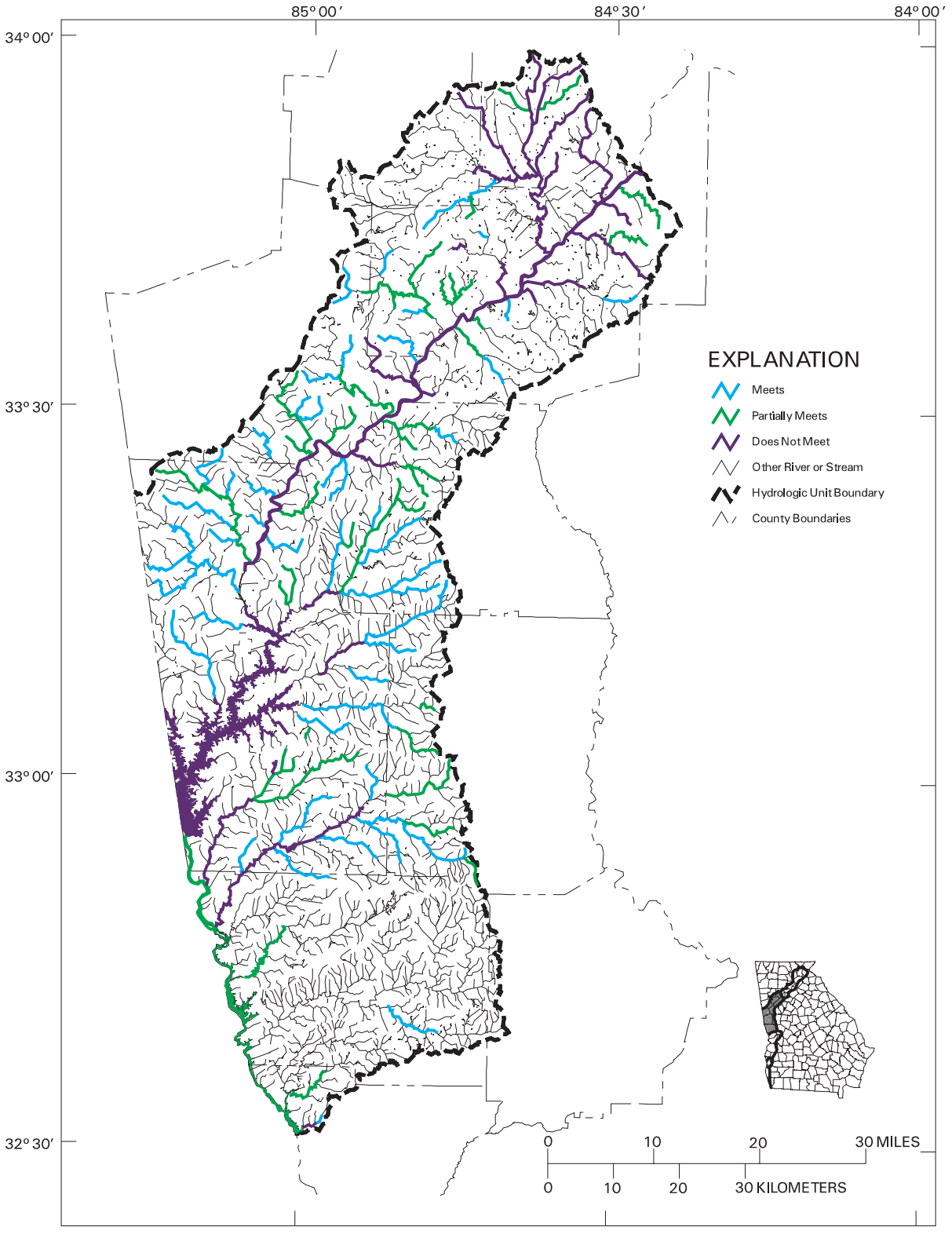

Figure 5-5. Assessment of Water Quality Use Support in the Middle Chattahoochee River Basin, HUC 03130002

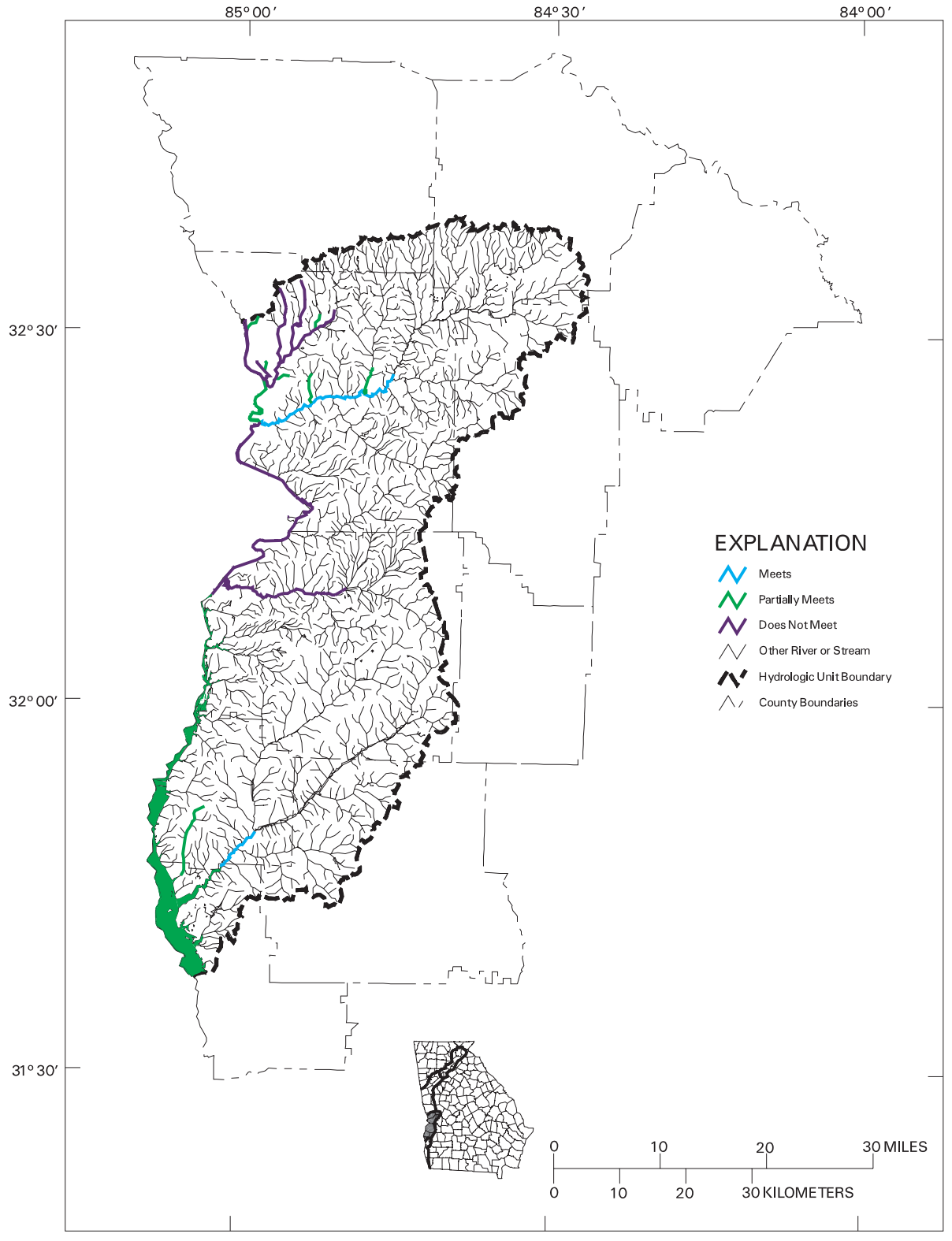

Figure 5-6. Assessment of Water Quality Use Support in the Middle Chattahoochee River Basin, HUC 03130003

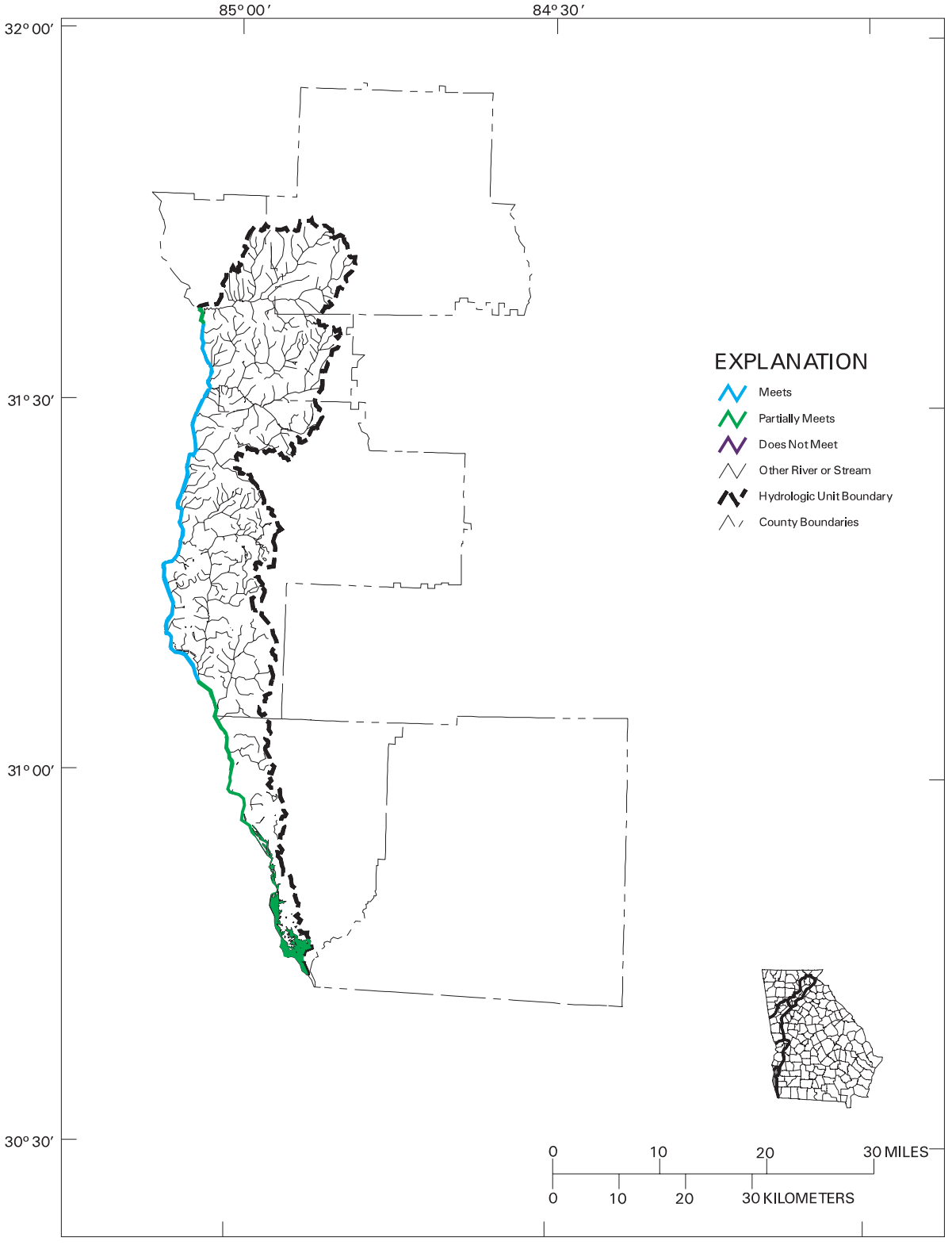

Figure 5-7. Assessment of Water Quality Use Support in the Lower Chattahoochee River Basin, HUC 03130004

by Buford Dam at Lake Lanier, which controls the entire flow in the basin passing River Mile 348.3. Below this point, the character of the river is strongly affected by operation and water releases by Buford Dam. At the southern end of the hydrologic unit, urbanization associated with metropolitan Atlanta is a dominant feature of the watershed.

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, 1996).

HUC 03130001 Area A: Headwaters, above Lake Lanier

Ten river basin monitoring stations were located within this sub-basin during the 1995 period, three of which were on the mainstem. During 1990-1994, four trend monitoring stations were sampled within this basin. Additional data were available at forty-nine stations. Data from the mainstem stations indicate that water quality conditions are being affected by both point and nonpoint source pollution. No excursions of the dissolved oxygen water standard were noted at upstream locations. Jasus Creek near Helen and the Chattahoochee River mainstem downstream from Jasus Creek had excursions of the lead standard. Yahoola Creek downstream from the Dahlonega WPCP had excursions of standards for lead and mercury. Mud Creek downstream from the City of Cornelia WPCP had excursions of the copper and zinc standards. Thirty tributary stations and three mainstem stations had excursions of the standard for fecal coliform bacteria due to non-point sources, including runoff from urban, agricultural and forested areas.

Trout waters in this area are susceptible to habitat degradation and stream warming. Because of rapid development in the mountainous areas, the quality of trout streams may be compromised by sedimentation from land disturbing activities and stream warming resulting from increased run-off from impervious surfaces, removal of riparian canopy, and the construction of small impoundments.

Benthic macroinvertebrate samples were collected at the following four sites in HUC 03130001, Area A in 1995.

Waterbody	Location	County	Date	RBMP II Score	Rating
Chattahoochee River	Helen , GA	White	951012	10	Very Good
Dicks Creek	FAS 144-1	Lumpkin	950815	10	Very Good
Mossy Creek	GA Hwy 254	White	950927	4	Poor
West Fork of Little River	Jess Helton Rd.	Hall	950927	4	Poor

Water quality based on benthic macroinvertebrate data ranged from Very Good to Poor. Potential agriculture nonpoint source impacts may be the cause of Mossy Creek's and West Fork of Little River 's Poor biological condition.

Limited fish tissue in this area of the Chattahoochee River Basin has been tested by EPD. Fish tissue monitoring in Lake Sidney Lanier, which receives runoff from the entire basin upstream, suggests there are not likely to be problems with fish tissue in this area.

HUC 03130001 Lake Water Quality: Lake Sidney Lanier

The Georgia DNR contracted with the University of Georgia (UGA) to conduct a Clean Lakes Phase I Diagnostic/Feasibility study of Lake Lanier in 1991 and 1992. This work was continued by the University of Georgia, North Georgia College, the Tennessee Valley Authority, and other contractors. Completion of this study is scheduled for 1997. Other water quality studies have been performed including the EPA National Eutrophication Survey conducted in 1973, the COE Water Quality Management Study conducted in 1978-79, the Georgia DNR Clean Lakes Program Lake Classification Survey conducted in 1980-81, the Georgia DNR Major Lake Monitoring Project conducted from 1984 through 1993, a Gainesville College study of 100 stations in 1987, the Georgia DNR Clean Lakes Water Quality Assessment Study conducted in 1989, and a North Georgia College study with quarterly monitoring since 1987. The Georgia DNR also maintains an in-lake ambient monitoring station, STORET number 12038001, at Browns Bridge, Georgia Highway 369, with data collection from July, 1977 to date.

The UGA Phase I Feasibility Study draft report states "the overall water quality in Lake Lanier is relatively good as determined by state and Federal standards." The trophic status indices show the lake is mesotrophic with some increase in eutrophication from 1973 to 1991. The main concern is possible water quality degradation if the loading of sediments and nutrients are not maintained at or below current loadings. The management of nutrient loading, particularly phosphorus, the growth limiting nutrient, is an important long-term objective in maintaining the current water quality. Nonpoint loads account for 80 to 90 percent of the total lake nutrient loading. Georgia plans to revise the State Rules and Regulations for Water Quality Control, Chapter 391-3-6, adopting specific water quality standards for Lake Lanier. These standards will include limits on chlorophyll *a*, total nitrogen, and phosphorus loading limits for the lake and its principal tributaries.

Other concerns discussed in the UGA Phase I Feasibility Study draft report include fecal coliform bacteria concentrations in some tributary streams and embayments, storage capacity loss from sedimentation, mercury detected in three water samples (two stations, two sample sets), and stress to striped bass population caused by low dissolved oxygen levels. The Georgia 1994-1995 305(b) Report lists portions of Lake Lanier as not fully supporting the designated use of Recreation due to excursions of standards for mercury, lead, and pH. The UGA report recommends additional metals sampling to assess the metals issue.

The Georgia DNR Wildlife Resources Division (WRD) participates in managing fishery resources in Lake Lanier. In 1986, WRD conducted a survey of the black bass population in Lake Lanier (Fisheries Management Section, 1988), using a tagging study. Annual estimates of survival, mortality and exploitation rates were determined from tag returns, and these data were used to predict the effect of more restrictive length limit regulations on yield and bass abundance. The 0.57 survival rate observed for largemouth bass was more than twice the 0.27 rate estimated for spotted bass. Natural mortality was the major factor influencing survival and was estimated at 0.42 for spotted bass and 0.27 for largemouth bass. The spotted bass exploitation rate of 0.31 appeared moderate, but there was no clear indication of over harvest in spite of the absence of a minimum length limit. The low largemouth bass exploitation rate (0.16) suggests that anglers are removing a small percentage of the population, therefore a minimum length limit larger than the existing 12 inch (304 mm) limit would likely have little impact on fish abundance.

In the early 1980s, Lake Lanier supported a trophy striped bass fishery, but declining summertime hypolimnetic dissolved oxygen levels, thought to be associated with increased nutrient loading and eutrophication, now limit the lake's ability to produce striped bass exceeding 20 pounds in size. WRD currently depends heavily on Lake Lanier as a source of brood stock for producing fingerling striped bass for stocking other reservoirs in the state and for replenishing the depleted natural population in the Savannah River. Nutrient input from the watershed, associated with rapid development and human population growth, is likely the primary cause of accelerated eutrophication.

Fish tissue quality in Lake Lanier has generally been found to be safe, with few consumption guidelines needed. Current guidelines for eating fish from Lake Sidney Lanier are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which will be published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrants a change.

Fish Consumption Guidelines

Lake Lanier

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass		No Restrictions	No Restrictions	
Catfish		No Restrictions	No Restrictions	
Carp			1 meal per month	PCBs

HUC 03130001 Area B: Below Buford Dam

Six trend monitoring stations were located within this sub-basin during the 1995 period, four of which were on the mainstem. During 1990-1994, the same six trend monitoring stations were sampled within this basin. Additional monitoring data were available at twenty-seven stations. Data from the mainstem stations indicate that water quality conditions are being negatively affected by both point and nonpoint source pollution. Excursions of the dissolved oxygen water standard due to stratification in Lake Lanier were noted downstream from Buford Dam on the mainstem and in Clear Creek in the City of Atlanta, perhaps responding to the combined effects of a Combined Sewer Overflow and nonpoint runoff. Twenty-six monitored tributaries draining the Metropolitan Atlanta area, which constituted the majority of this sub-basin had excursions of standards for metals, including lead, copper, zinc and cadmium, and excursions of the standard for fecal coliform bacteria. "Urban Runoff" is the most commonly assessed cause of non-support in this area.

Between March 1993 and April 1994, USGS conducted a special study with weekly sampling and analysis for 84 common pesticides within Sope Creek, a 30 mi^2 watershed in the metropolitan Atlanta area in which the land use is 83 percent urban (Hippe et al., 1994). Target analytes included many pesticides used for weed and insect control in the area, although a number of commonly used pesticides were not covered in the analysis, including paraquat, methanearsonate, glyphosate, DSMA, MSAMA, and several chlorophenoxy herbicides. Results

for this watershed are suspected to be typical of other urban watersheds in the basin, which have generally not been sampled for pesticides. Eighteen herbicides and seven insecticides were detected in water samples from Sope Creek watershed. Median concentrations for each detected pesticide were well below EPA standards and guidelines for drinking water. In one sample, the maximum observed concentration for the herbicide simazine exceeded the maximum contaminant level (MCL) for drinking water allowed by EPA drinking-water standards; however, the median concentration for all samples was only 3 percent of the MCL. Atrazine and diazinon were detected throughout the year, but had median concentrations that were only 1 percent of the MCL and 3 percent of the lifetime health advisory, respectively. Maximum concentrations of five detected insecticides and median concentrations of chlorpyrifos and diazinon exceeded EPA guidelines for protection of aquatic life; however, EPA has not promulgated national standards for these insecticides. The data suggest the possibility of significant adverse impacts on aquatic life. As noted below, however, fish species composition in Sope Creek appears less impacted than that in many other urban tributaries of metropolitan Atlanta.

Within the Chattahoochee mainstem, the tailwater trout fishery faces the same types of threats as noted for mountain streams in Area A. Rapid development in the Atlanta metropolitan area results in considerable sediment input, and warm water runoff from tributaries can push river temperatures up to marginal conditions for trout, especially during summer storm events. Seasonally low dissolved oxygen and high iron and manganese levels in tailwater releases from Buford dam impact the productivity and health of the aquatic system. Hydropower production during peak demand times results in alteration of natural flows in the tailwater and bank erosion below Buford Dam.

Aquatic habitat in tributary streams in the metropolitan Atlanta area has been affected by urbanization. In November 1993, personnel from the USGS surveyed fish in sections of nine tributaries of the Chattahoochee River Basin in Metropolitan Atlanta (Couch et al., 1995). Eight of the tributaries, Nickajack Creek, Rottenwood Creek, Sope Creek, Willeo Creek, Nancy Creek, Peachtree Creek, Proctor Creek, and Utoy Creek, receive runoff from urban areas such as subdivisions, office and industrial parks, shopping malls, airports, roads, and golf courses. In addition to these urban basins, Snake Creek was surveyed to provide a comparison of fish populations in a mostly forested basin. These creeks are at the border between Hydrologic Units 03130001 and 03130002, with Rottenwood, Sope, Willeo, Nancy, and Peachtree Creeks falling in HUC 03130001 and the remainder in 03130002.

USGS sampled these streams with a combination of backpack electro-fishing and seining. Results are summarized in Table 5-6. Although the 8 urban streams vary from 2 to 15 in the number of native species found, they share several characteristics in their fish populations.

Generally, fewer numbers of individual fish were found in the urban streams, and a larger percentage of non-native species were found in Nancy, Peachtree, Rottenwood, Proctor, and Utoy Creeks. One potential cause of degradation is alteration of the stream bottom habitat by filling in natural gravel and cobble substrates with sand and silt as a result of erosion in the watershed. Native minnow and sucker species were almost completely absent in Nancy, Peachtree, Rottenwood, Proctor, and Utoy Creeks. These 5 creeks differ from Sope, Nickajack, and Willeo Creeks in having a greater amount of or proximity to industrial, commercial, and transportation areas.

Table 5-6. Fish Species Identified in Metropolitan Atlanta Tributary Streams (Couch et al., 1995), Arranged in Decreasing Order of Number of Native Species.

Creek	Total Native Species	Total Species	Total Individuals	Percent Non-native
Snake Creek (reference site)	16	17	641	< 1
Sope Creek	15	18	307	2
Nickajack Creek	13	16	282	17
Willeo Creek	12	13	185	<1
Nancy Creek	11	15	220	38
Peachtree Creek	11	15	1740	29
Rottenwood Creek	5	8	80	47
Proctor Creek	2	5	224	91
Utoy Creek	2	3	5	40

The large number of mosquitofish found in Peachtree Creek may indicate poor water quality. Similar to the non-native red shiner, white sucker and green sunfish species, mosquitofish are tolerant of a wide range of water-quality conditions. After mishaps, such as sewer overflows which impact fish populations, mosquitofish can repopulate a stream rapidly. They have short life cycles, and unlike other fish species found in these streams, bear their young live rather than lay eggs.

Benthic macroinvertebrate samples were collected from two sites in HUC 03130001, Area B during the basin assessment in 1995:

Waterbody	Location	County	Date	RBMP II Score	Rating
Ivy Creek	Interstate 985	Gwinnett	950928	0	Very Poor
Unnamed trib to Ivy Creek	below Hwy 20	Gwinnett	950928	6	Good

The unnamed tributary to Ivy Creek had good water quality based on benthic macroinvertebrate data. Further downstream on Ivy Creek at I-985, benthos data suggests a very poor biological condition due in part to instream habitat destruction and a significant reduction in Ephemeroptera, Plecoptera, and Trichoptera pollution-sensitive taxa. Nonpoint runoff may be contributing to much of the impact found at this site. In addition, there was sewerline construction occurring in this area of the watershed.

Additional biological assessments are being conducted as part of the City of Atlanta Urban Watershed Initiative (Hall and Richards, 1997). This study noted significant biological impairment (benthos and fish) at all stations sampled. Severe habitat degradation (erosion and sedimentation) was a primary contributor at many sites, yet even sites with excellent or good habitat showed biological impairment.

Guidelines for eating fish from this section of the Chattahoochee River Basin are listed in the following tables. This guidance may differ from the guidance issued in the 1994-1995 305(b)

Report because of additional samples collected in 1995. The data shown in these tables are the new guidance which was published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Chattahoochee River -- Lanier Dam to Morgan Falls Dam

Species	Site Tested	Recommendation	Chemicals
Brown Trout	Lanier Dam to Morgan Falls Dam	No Restrictions	
Rainbow Trout	See Above	1 meal per week	Mercury
Carp	See Above	1 meal per month	PCBs / Chlordane
Spotted Sucker	See Above	No Restrictions	
Largemouth Bass	See Above	1 meal per week	PCBs / Chlordane
Yellow Perch	See Above	1 meal per week	PCBs / Chlordane
Redear Sunfish	See Above	No Restrictions	

Fish Consumption Guidelines

Chattahoochee River -- Morgan Falls Dam to Peachtree Creek

Species	Site Tested	Recommendation	Chemicals
Largemouth Bass	Below Morgan Falls Dam	No Restrictions	
Carp	See Above	1 meal per month	PCBs

5.2.4.2 Hydrologic Unit Code 03130002 (Middle Chattahoochee River from Atlanta to Columbus)

Hydrologic Unit 03130002 contains the Chattahoochee River Basin between Atlanta and Columbus, at the Fall Line, and is located entirely within the Southern Piedmont land resource area (see Figures 2-3 and 2-6). Both the northern and southern ends of this hydrologic unit have significant urbanization, while much of the area between is in forest and other rural land uses. The Chattahoochee is free-flowing between Atlanta and West Point Lake. There are eight hydroelectric dams between West Point Lake and Columbus, which take advantage of the natural gradient of this section of the river.

Appendix E, Table E-2 summarizes the determination of support for designated uses of rivers and streams within this hydrologic unit, based on analysis of 1994–1995 data (GA DNR, 1996).

HUC 03130002 Area A: Chattahoochee and Tributaries from below Peachtree Creek to West Point Lake

Nine trend monitoring stations were located within this sub-basin during the 1995 period, four of which were on the mainstem. During 1990-1994, six trend monitoring stations were sampled within this basin. Additional monitoring data were available at ninety-eight stations. Data from the mainstem stations indicate that water quality conditions are being negatively affected by both point and nonpoint source pollution. Excursions of the dissolved oxygen water standard

were noted in Sandy Creek in Fulton County, responding to the effects of urban runoff. On the mainstem at three monitored sites excursions of standards for fecal coliform bacteria and lead were measured. Also on the mainstem immediately downstream from two metro-area Atlanta wastewater treatment facilities and a coal-fueled electric power plant the standard for temperature was exceeded. Fifteen monitored tributaries in the sub-basin had excursions of standards for metals, including lead, copper, cadmium and mercury. Forty-five monitored tributaries had excursions of the standard for fecal coliform bacteria.

Aquatic life in the Chattahoochee River from Peachtree Creek downstream to West Point Lake has been impacted by urban runoff and municipal/industrial discharges from the City of Atlanta. In 1990–92, the DNR Wildlife Resources Division conducted a study of the status of fish populations in the Chattahoochee below Atlanta (Fisheries Management Section, 1992). This report documents the following findings: Indices of abundance, diversity and health of the fish population found in the first 64 km of the Chattahoochee River downstream of Atlanta were investigated using electrofishing data. Fish catch-per-unit-effort (CPUE) was considered low and samples were dominated by bluegill (*Lepomis macrochirus*; 32 %) and carp (*Cyprinus carpio*, 21 %). Carp comprised approximately 75% of the biomass. Biotic integrity of the population ranged from 37% to 53% of normal. Bluegill were considered to be in a normal state of health using gross examination in the field and histological techniques in the laboratory.

Water quality within this segment has improved immensely since 1972 when the study area was described as "...in near septic condition for a reach of 35 miles" (GA DNR, 1972). This improvement is due to enhanced treatment of sanitary sewage. In recent years, water quality standards for the "Fishing" use classification have been satisfied most of the time. Exceptions in recent years were levels of dissolved oxygen ($\leq$ 4 mg/L) which occurred during a period of severe drought in 1988. A major fish kill occurred in this area during October 1988, but a causative agent was not, however, identified. Other than this event, fish kills in the river have not been commonplace since 1976. WRD reports that kills in tributary streams have been a major problem for many years. Causative agents could not be identified for many of these kills, but natural causes (e.g., infectious diseases) were eliminated in most every case. Discharges of raw sanitary sewage and industrial chemicals were identified most often as causative agents.

In the Metropolitan Atlanta area, degradation of habitat and water quality of tributary streams appears to have resulted in a decreased population of native fish species and increased importance of non-native pollution-tolerant species. Couch *et al.* (1995) discuss fish species occurrence in various tributaries in this reach, including Snake, Nickajack, Proctor, and Utoy Creeks, along with other metropolitan Atlanta tributaries falling within Hydrologic Unit 03130001. Results for these creeks are given above in the discussion of Hydrologic Unit 03130001, Area B.

Benthic macroinvertebrate samples were collected from two sites in this sub-basin in 1995:

Waterbody	Location	County	Date	RBMP II Score	Rating
Centralhatchee Creek	Armstrong Mill Rd.	Heard	950831	8	Very Good
Chattahoochee River	Bush Head Shoals	Heard	951002	5	Poor

The Rapid Bioassessment II index score for the Chattahoochee River at Bush Head Shoals suggests good water quality; however, the overall rating was poor due in part to a significant reduction in EPT taxa.

Guidelines for eating fish from this section of the Chattahoochee River Basin are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which was be published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Chattahoochee River -- Peachtree Creek to Franklin, GA

Species	Site Tested	Recommendation	Chemicals
Largemouth Bass	Peachtree Creek to Franklin, Ga	1 meal per month	PCBs / Chlordane
Carp	Peachtree Creek to Franklin, Ga	1 meal per month	PCBs / Chlordane
Channel Catfish	Peachtree Creek to Franklin, Ga	1 meal per week	PCBs / Chlordane
Striped Bass	Peachtree Creek to Franklin, Ga	1 meal per month	PCBs

HUC 03130002 Lake Water Quality: West Point Lake

The water use classifications for West Point Lake are Fishing in the headwaters, and Recreation throughout the remainder of the lake. A large body of work has been conducted on West Point Lake since 1970. Some of the earlier work includes a 1970-1971 Environmental Impact Study, 1975-1976 *Environmental Evaluation of Releases From West Point Dam* report, 1978-1979 Water Quality Management Studies and a 1979 *Fisheries and Limnological Studies* report, all by the Army Corps of Engineers. The U.S. Department of the Interior conducted a study on Effects of Nutrients on Algal Growth in 1975-1976. Georgia had a West Point Lake Reservoir Monitoring Project in 1975, the Georgia Clean Lakes Classification Survey in 1980 and 1981, and the Georgia DNR Major Lakes Monitoring Project (MLMP) from 1984 through 1993. West Point Lake was documented as being excessively eutrophic, having water quality problems lake-wide that resulted in impairment of its designated uses. The Georgia DNR and the U.S. EPA conducted a study of phosphorus loading in 1987 and 1988. The result of this study was administrative orders issued by EPD to the major dischargers on the Chattahoochee River to limit the discharge concentration of total phosphorus to 0.75 mg/l. The Georgia DNR, Alabama DEM, and the U.S. EPA initiated a Phase 1 Diagnostic Feasibility Study of West Point Lake in 1991-1992. This study was performed by La Grange College, the University of Georgia and Auburn University. The study resulted in the adoption of lake water quality standards in 1995 for West Point Lake. Also, the Chattahoochee River Modeling Project (CRMP, 1993-1997) will provide important input data for the water quality model currently being built by the Army Corps of Engineers for West Point Lake. This model is scheduled for completion in 1998. The 1994-1995 305(b) Report listed West Point Lake as not supporting its water use classification of Fishing/Recreation due to Fish Consumption Guidelines, discussed below. Non-point source and urban runoff are the suspected causes.

Guidelines for eating fish from West Point Lake are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which was published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

West Point Lake

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass	*	*	No Restrictions	
Hybrid Bass	No Restrictions	1 meal per week	1 meal per week	PCBs
Channel Catfish		1 meal per week	1 meal per month	PCBs
Carp		1 meal per week	1 meal per week	PCBs
Black Crappie	No Restrictions			

* Only largemouth bass 16 inches and longer may be legally retained and possessed on West Point Lake.

HUC 03130002, Area B: Chattahoochee and Tributaries, West Point Dam to Oliver Dam

Five trend monitoring stations were located within this sub-basin during the 1995 period, one of which was on the mainstem. During 1990-1994, two trend monitoring stations were sampled within this basin. Monitoring data were also available from an additional twenty-one stations. Data from the mainstem stations indicate that water quality conditions are impacted by both point and nonpoint source pollution. Excursions of the dissolved oxygen water standard were noted in the river downstream of West Point Dam due to releases of oxygen-depleted bottom water from the dam. Excursions of the dissolved oxygen standard were also measured in Ollie Creek in Meriwether county, probably due to non-point sources and in Long Cane Creek near LaGrange as a result of urban runoff. Four monitored tributaries had excursions of standards for metals lead, copper and zinc. Eight tributary stations had excursions of the standard for fecal coliform bacteria attributed to urban runoff and other non-point sources.

For a distance of approximately 13 miles downstream from West Point Lake, reduced flows and low dissolved oxygen levels have impacted aquatic communities in the Chattahoochee River. Since the construction of West Point Reservoir the fish population structure of the river downstream has changed from one characterized by riverine species to one dominated by the same fish that inhabit the upstream reservoir. Indigenous populations of shoal bass, a threatened species in Georgia, have declined and may no longer be present in this portion of the river.

Low dissolved oxygen levels below West Point reservoir have been identified as the cause of two fish kills in the tailwater. The severity of this problem is inconsistent, primarily reflecting the stratification of the reservoir during the summer months. During summers of unusually high rainfall, increased flows in the reservoir decrease stratification and ameliorate chronic low dissolved oxygen levels in the tailwater.

Hydropeaking operation of West Point Dam results in significant alteration of natural stream flows. While major flood events are largely unaltered, it is likely that intermediate high flow events occur less frequently while low flow events occur much more frequently. Daily flow fluctuations are also markedly greater in magnitude.

Two locations in this sub-basin were sampled for benthos in 1995:

Waterbody	Location	County	Date	RBMP II Score	Rating
Mulberry Creek	Co. Rd. 209	Harris	950831	5	Poor
Flat Shoals Creek	GA Hwy 103	Troup	950907	8	Very Good

Even though the Rapid Bioassessment II Index suggests Good water quality, the Mulberry Creek collection produced a Poor rating due in part to instream habitat destruction. There was a considerable amount of stream bank stability failure occurring in this part of the watershed.

Fish tissue within this area of the Chattahoochee River has not been tested because fish collected in Lake Harding and Goat Rock Lake are thought to be representative of the fish that would be collected in the small stretch of River north of these two Lakes.

HUC 03130002 Lake Water Quality: Lake Harding (Bartlett's Ferry Reservoir)

Bartlett's Ferry Reservoir, also called Lake Harding, is located approximately 7 miles northwest of Columbus, Georgia, on the Alabama-Georgia border. The water use classification for the Chattahoochee River is Fishing from West Point Manufacturing Company to Osanippa Creek, which includes the headwaters of Lake Harding. The remainder of the lake is classified Recreation and Drinking Water.

The US EPA included Lake Harding in their 1973-1974 National Eutrophication Study. It was one of 15 Georgia lakes in the study. The report was issued in June of 1975. Other water quality studies have been performed on Lake Harding, including the Georgia Clean Lakes Program Lake Classification Survey conducted in 1980 and 1981, the Georgia DNR Major Lake Monitoring Project (MLMP) from 1984 through 1993, and the Georgia Clean Lakes Water Quality Assessment Study conducted in 1989. Additional studies have been produced by Georgia Power and the Alabama Department of Environmental Management (ADEM). The 1973-1974 study documented that Lake Harding was highly eutrophic. It ranked last in overall trophic quality of the Georgia lakes tested, with the highest median total phosphorus, median dissolved phosphorus and median inorganic nitrogen. The impoundment of West Point Lake in 1975-1976 is thought to have improved water quality in Lake Harding. Most recently, the MLMP Report for 1993 indicated that phosphorus levels for the 11 lower Piedmont lakes, including Harding, ranged from 0.05 to 0.09 mg/l. Lake Harding was measured at 0.07 mg/l levels.

The 1994-1995 305(b) Report listed Lake Harding as only partially supporting its water classification of Fishing/Recreation. The reason for the "partial support" designation were the fish consumption guidelines issued for the lake, believed to be necessary due to nonpoint pollution sources. The guidelines are for the whole lake.

Guidelines for eating fish from Lake Harding are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which was published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Lake Harding (Bartlett's Ferry)

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass		1 meal per week	1 meal per month	PCBs
Hybrid Bass	1 meal per week		1 meal per month	PCBs
Channel Catfish	1 meal per week	1 meal per month	1 meal per month	PCBs
Crappie	No Restrictions	No Restrictions		

HUC 03130002 Lake Water Quality: Goat Rock Lake

The water use classification for Goat Rock Lake, also known as Goat Rock Reservoir, is Recreation and Drinking Water. The US EPA included Goat Rock Lake in their 1973-1974 National Eutrophication Study. Although not one of the targeted study lakes, data were collected in the headwaters of Goat Rock Lake in the study of Lake Harding. Other water quality studies have been performed on Goat Rock Lake, including *Water Quality Above and Below Goat Rock Dam, 1972 through 1977* (GA DNR), Georgia DNR Clean Lakes Program Lake Classification Survey conducted in 1980 and 1981, Bartletts Ferry Water Quality Report, 1982, 1984, 1987 (Georgia Power) and the Georgia DNR Major Lakes Monitoring Project (MLMP) from 1984 through 1993. Additional studies have been produced by Georgia Power and the Alabama Department of Environmental Management (ADEM). The MLMP Report for 1993 indicated that phosphorus levels for the 11 lower Piedmont lakes, including Goat Rock, ranged from 0.05 to 0.09 mg/l. Goat Rock Lake was measured at 0.09 mg/l levels. A total trophic state index was calculated for all 27 lakes sampled. The index ranged from a high of 196 (worst) to a low of 122 (best). The index for Goat Rock Lake was 173.

The 1994-1995 305(b) Report listed Goat Rock lake as only partially supporting its water quality classification of fishing. Copper was detected in a single sample in excess of water quality standards, and fish consumption guidelines are in effect. It is believed that nonpoint source pollution is responsible for the problems. Approximately 60% of the lake area is affected.

Guidelines for eating fish from Goat Rock Lake are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which was published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Goat Rock Lake

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass		1 meal per week	1 meal per month	PCBs
Hybrid Bass	1 meal per month		1 meal per month	PCBs
Black Crappie	No Restrictions			
Channel Catfish		No restrictions	1 meal per month	PCBs
Spotted Sucker			1 meal per week	PCBs

HUC 03130002 Lake Water Quality: Lake Oliver

The water use classification for Lake Oliver is Recreation and Drinking Water. Water quality studies have been conducted on Lake Oliver since its impoundment in 1959. These include the Georgia DNR Clean Lakes Classification Survey conducted in 1980 and 1981 and the Georgia DNR Major Lakes Monitoring Project (MLMP) from 1984 through 1993. Additional studies will be found with Georgia Power, the Alabama Department of Environmental Management (ADEM) and the City of Columbus. The MLMP report for 1993 indicated that phosphorus levels for the 11 lower Piedmont lakes, including Lake Oliver, ranged from 0.05 to 0.09 mg/l. Lake Oliver was measured at 0.08 mg/l. A total trophic state index was calculated for all 27 lakes sampled. The index ranged from a high of 196 (worst) to a low of 122 (best). The index for Goat Rock Lake was 170.

The 1994-1995 305(b) Report listed Lake Oliver as not supporting its Drinking Water/ Recreation classification. This was due to the issuance of fish consumption guidelines, which are in effect for the whole lake. The problem is believed to be due to nonpoint source pollution.

Guidelines for eating fish from Lake Oliver are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which will be published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Lake Oliver

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass		1 meal per week	1 meal per month	Mercury PCBs
Catfish		1 meal per month	1 meal per month	PCBs
Bluegill	No Restrictions			
Redear Sunfish	No Restrictions			

5.2.4.3 Hydrologic Unit Code 03130003 (Middle Chattahoochee River from Columbus to Lake Walter F. George)

Hydrologic Unit 031300003 runs from Columbus, GA to Walter F. George Lock and Dam, and lies primarily within the Georgia Sand Hills land resource area (see Figure 2-7). Lake George, with a surface area of 45,181 acres at full pool, is the dominant feature of this hydrologic unit.

Appendix E, Table E-3 summarizes the determination of use support for designated uses of rivers and streams within this hydrologic unit, based on analysis of water quality data (GA DNR, 1996).

Five trend monitoring stations were located within this sub-basin during the 1995 period, three of which were on the mainstem. During 1990-1994, three trend monitoring stations were sampled within this basin. Additional monitoring data were available from twelve stations. Data from the mainstem stations indicate that water quality conditions are being impacted by both point and nonpoint source pollution. No violation in the dissolved oxygen water quality standard was measured in the sub-basin. On the mainstem in the Columbus area the standard for fecal coliform bacteria was exceeded due to urban runoff. Three tributary stations had excursions of the standard for fecal coliform bacteria in the Columbus area. Two tributaries of Lake Walter F. George had excursions of the fecal coliform bacteria standard. Eight monitored tributaries draining the urban area of Columbus in the most upstream part of this sub-basin had excursions of the copper standard.

Benthic macroinvertebrate samples were collected at the following four sites during the basin assessment in 1995:

Waterbody	Location	County	Date	RBMP II Score	Rating
South Fork Upatoi Creek	GA Hwy 22	Talbot	950816	8	Very Good
Pine Knot Creek	GA Hwy 355	Marion	950816	6	Good
Pataula Creek	co. rd. 31	Randolph	950830	6	Good
Chattahoochee River	½ mile d/s Oswichee Ck. confluence	Chattahoochee	950919	1	Very Poor

The Chattahoochee River location was difficult to sample due to its non-wadeable condition and habitat availability. Very few EPT taxa were collected at this site. Causes for a Very Poor biological condition rating are due in part to channel alteration for navigation purposes and regulated water flows by Oliver Dam in Columbus.

Guidelines for eating fish from this section of the Chattahoochee River Basin are listed in the following tables. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in these tables are the new guidance which were published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Chattahoochee River -- Oliver Dam to Chattahoochee County

Species	Site Tested	Recommendation	Chemicals
Largemouth Bass	Eagle Phenix Dam to Chattahoochee Co.	No Restrictions	
Channel Catfish	See Above	1 meal per week	PCBs

Fish Consumption Guidelines

Chattahoochee River-Chattahoochee and Stewart Counties

Species	Site Tested	Recommendation	Chemicals
Largemouth Bass	Oswichee Creek to Omaha, Ga	No Restrictions	
Crappie	See Above	No Restrictions	
Channel Catfish	See Above	No Restrictions	

HUC 03130003 Lake Water Quality: Walter F. George Reservoir

Walter F. George Reservoir is formed by the United States Army Corps of Engineers (COE) dam near Fort Gaines, Georgia. The water use classification of the reservoir upstream of the Cowikee Creek confluence is Fishing; the balance of the reservoir is classified Recreation.

The Georgia DNR conducted a Clean Lakes Phase I Diagnostic/Feasibility study of this reservoir in 1990 and 1991. This work was continued by the U.S. Army Corps of Engineers and Auburn University in 1992, and a second Phase I Diagnostic/Feasibility study was conducted by the Alabama Department of Environmental Management (ADEM) and Auburn University in 1992 and 1993. Other water quality studies have been performed including the EPA National Eutrophication Survey conducted in 1973 and 1974, the Georgia DNR Clean Lakes Program Lake Classification Survey conducted in 1980 and 1981, the Georgia DNR Major Lake Monitoring Project conducted from 1984 through 1993, and the Georgia DNR Clean Lakes Water Quality Assessment Study conducted in 1989.

A joint Feasibility Study report, prepared by Georgia DNR and Alabama DEM in 1996, concluded the reservoir was in relatively good condition. No water use impacts (fishing and recreation) were documented. The trophic status was documented as eutrophic. Therefore, the management of nutrient loading, particularly phosphorus, is an important long-term objective in maintaining the current water quality. On November 6, 1996, Georgia revised the State Rules and Regulations for Water Quality Control, Chapter 391-3-6, adopting specific water quality standards for the Walter F. George Reservoir. These standards include limits on chlorophyll *a*, total nitrogen, and phosphorus loading limits for the Chattahoochee River and the Reservoir. Monitoring for compliance with these standards began in 1997.

Recently, the nuisance aquatic weed Hydrilla was identified in a few locations in Lake W. F. George, and there is some concern that it will become abundant enough to cause adverse impacts on the fishery and on other recreational uses. Other concerns discussed in the Phase I Feasibility Report included metals detected in water samples (one sample set), chlordane detected in headwater fish samples, and small populations of nuisance aquatic plants including stands of alligator weed. The Georgia 1994-1995 305(b) Report lists portions of Walter F.

George Reservoir as not fully supporting the designated uses of Recreation and Fishing due to excursions of the water quality standard for lead and fish consumption guidelines.

The Georgia DNR Wildlife Resources Division (WRD) participates in managing fishery resources in the Walter F. George Reservoir. WRD data indicate that Lake George supports a healthy sport fish population. The standing crop game fish populations had significant increases from the 1975/1978 survey period to the 1987/1990 survey period. Predatory game fish increased by 240 percent and non-predatory game fish increased by 170 percent.

Guidelines for eating fish from Lake Walter F. George are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which will be published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Lake Walter F. George (Eufaula)

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass	*	*	1 meal per week	Mercury, PCBs
Hybrid Bass		1 meal per month	1 meal per month	Chlordane, PCBs
Catfish	No Restrictions	No Restrictions	1 meal per month	Chlordane, PCBs
Crappie	No Restrictions			

*Only largemouth bass 16 inches and longer may be legally retained and possessed on Lake Walter F. George.

5.2.4.4 Hydrologic Unit 03130004 (Lower Chattahoochee)

Hydrologic Unit 031300004 runs from Walter F. George Lock and Dam at Fort Gaines, Georgia to Lake Seminole, at the Georgia/Florida border, and is primarily within the Southern Coastal Plain land resource area (see Figure 2-8). Only a few small tributaries enter the Chattahoochee from the Georgia side in this reach, so assessment focuses on the mainstem, which is controlled for navigation.

Appendix E, Table E-4 summarizes the determination of support for designated uses of rivers and streams within this hydrologic unit, based on analysis of 1994–1995 data (GA DNR, 1996).

Four trend monitoring stations were located within this sub-basin during the 1995 period, all of which were on the mainstem. During 1990-1994, one trend monitoring station was sampled within this basin. No additional sampling was conducted. Data from the mainstem stations indicate that water quality conditions are being negatively affected by both point and nonpoint source pollution. The water quality standard for lead was exceeded due to non-point sources and the mainstem from U.S. Highway 84 to Lake Seminole was affected. No other excursions of water quality standards were measured.

Periodic fish kills have occurred below Lake George for a number of years. These are attributed to low dissolved oxygen in releases from W.F. George Lock and Dam.

Benthic macroinvertebrates were collected from a single location in HUC 03130004 in the summer of 1995.

Waterbody	Location	County	Date	RBMP II Score	Rating
Kolomoki Creek	Co. Rd. 134 at Co. border	Clay / Early	950829	10	Very Good

Fish tissue in this area of the Chattahoochee River Basin was sampled for the first time in the fall of 1996. Samples are being analyzed at this time and data will not be available until fall of 1997. This data will be used to produce guidance for fish consumption in the 1998 Georgia Sport Fishing Regulation and 1998 Guidelines for Eating Fish from Georgia Waters booklet.

HUC 03130004 Lake Water Quality: Lake Seminole

Lake Seminole, terminus of the Chattahoochee and Flint basins, has a designated water use classification of Recreation. Various quality studies have been performed including the EPA National Eutrophication Survey conducted in 1973-74, the COE Water Quality Management Study conducted in 1978-79, the Georgia DNR Clean Lakes Program Lake Classification Survey conducted in 1980-81, the Georgia DNR Major Lake Monitoring Project conducted from 1984 through 1993, and the Georgia DNR Clean Lakes Water Quality Assessment Study conducted in 1989. The Georgia DNR also maintains two upper-lake ambient monitoring stations: STORET number 12230001, on the Chattahoochee River at Georgia Highway 91; and STORET number 11110001, on the Flint River, 0.8 miles downstream of the Bainbridge State Docks. The data collection record at these stations is from July 1973, to date.

The EPA National Eutrophication Survey report indicated the lake was eutrophic. Carlson trophic state indices from subsequent Georgia DNR studies, generally ranging from 50 to 60, confirm this. The management of nutrient loading is an important long-term objective in maintaining the current water quality.

The lake is shallow with many standing trees and an abundance of macrophytes. These include many nuisance aquatic plants, with Hydrilla being the most prolific. Hydrilla infestation increased from one acre in 1967 to about 24,000 acres (64% of the lake) in 1992. The COE has implemented various aquatic plant management techniques, including aquatic herbicide application and confined grass carp stocking, reducing the current Hydrilla problem to about 14,000 acres. The Georgia 1994-1995 305(b) Report lists portions of Lake Seminole as not fully supporting the designated use of Recreation due to fish consumption guidelines. Fish consumption guidelines are discussed in the following paragraph.

Guidelines for eating fish from Lake Seminole are listed in the following table. This guidance may differ from the guidance issued in the 1994-1995 305(b) Report because of additional samples collected in 1995. The data shown in this table is the new guidance which will be published in the 1997 Georgia Sport Fishing Regulations and 1997 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on EPA risk-based management approach and combines historical fish tissue data with data from the 1995 fish tissue collection to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines

Lake Seminole

Species	Less than 12 inches	12-16 inches	Over 16 inches	Chemicals
Largemouth Bass		No Restrictions	No Restrictions	
Channel Catfish		No Restrictions	No Restrictions	
Bullhead	No Restrictions	1 meal per week		Mercury

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