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Section 5

Assessments of Water Quantity and Quality

This section provides an evaluation of the current conditions in the Coosa River basin, in terms of both water quantity (Section 5.1) and water quality (Section 5.2) issues. The assessment results are then combined with the evaluation of environmental stressors from Section 4 to produce a listing of Concerns and Priority Issues in Section 6.

5.1 Assessment of Water Quantity

Water quantity issues in the Coosa River basin are being addressed comprehensively as part of the ACT/ACF study. In that process an Interstate Compact has been established to administer a water allocation formula which will partition the flow of the Coosa River between Alabama and Georgia. The following sections provide a summary of preliminary findings from this study.

5.1.1 Municipal and Industrial Water Uses

As noted in Section 3.2, municipal and industrial (M&I) demands from the Coosa River basin are expected to increase by about 50 percent between 1995 and 2020, virtually all from surface water sources. By the year 2050, M&I water use is expected to increase another 40 percent (which includes Cobb County withdrawals).

Drinking Water Quality: Surface Water

Overall, the surface water quality in the Coosa River basin is good for use as drinking water. All public water systems in the state of Georgia that use surface water meet federal Surface Water Treatment Rules for filtration and treatment. However, surface water quality problems due to nonpoint source pollution such as agricultural and storm water runoff are concerns to municipalities that withdraw surface water from the Coosa River and tributaries. The contaminant of most concern is high turbidity, especially rapid increases in turbidity, due to erosion and sediment runoff. Water high in turbidity can clog filters, interrupt the proper treatment of raw water, and increase the cost of the water to the consumers because more chemicals must be applied to settle out the sediment. Many water plants have reservoirs to store large amounts of water and to settle out excess

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

Drinking Water Quality: Ground Water

Overall ground water quality from wells are very good for use as drinking water from wells. Since most wells used in public water systems are constructed by licensed well drillers and draw from deep aquifers, the number of contaminated wells is small. However, in the Coosa basin a few public water system wells have been contaminated by local pollution sources such as leaking underground storage tanks, malfunctioning septic tanks, spills, and possibly agricultural activities. If a well exceeds the Maximum Contaminant Level (MCL) for a contaminant, it is removed from service or additional treatment is added to the system. Also, a few springs in the basin have been found to be under the direct influence of surface water due to the geology of the area in which they are located. These springs are monitored and have additional treatment requirements.

5.1.2 Agriculture

The water demand for agricultural use in the Coosa basin is, and will remain for the foreseeable future, a small portion of the total demand. Whether taken from surface or ground water sources, there is no reason to believe that the supply will not be adequate, even during a drought year.

5.1.3 Recreation

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

5.1.4 Hydropower

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

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

Conasauga River Basin (HUC 03150101)

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

HUC 03150102-Coosawattee River Basin

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

HUC 03150103-Oostanuala River Basin

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

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

HUC 03150104-Etowah River Basin

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

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

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

HUC 03150105-Coosa River below Rome and Chattooga River Basin

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

5.1.5 Navigation

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

5.1.6 Waste Assimilation Capacity

Georgia has obligations under the Clean Water Act to meet instream water quality standards, and the state places a high priority on this obligation (see Section 6.0). Only under extreme drought conditions, when sufficient water flow is not available after domestic water supply needs are met, might there be insufficient water to meet instream water quality standards. If this becomes the case, EPD will require more treatment at water treatment plants.

5.1.7 Assessment of Ground Water

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

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

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

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

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

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

Sinkhole Formations

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

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

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

Ground Water/Surface Water Interactions

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

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

Specific Ground Water Concerns

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

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

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

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

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

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

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

5.2 Assessment of Water Quality

This assessment of water quality generally reflects Georgia's water quality assessments for reporting to EPA under Section 305(b) of the Clean Water Act. It begins with a discussion of (1) water quality standards, (2) monitoring programs, and (3) data analyses to assess compliance with water quality standards and determine use support. Following this introductory material, detailed assessment results by subbasin are presented in Section 5.2.4.

5.2.1 Water Quality Standards

Assessment of water quality requires a baseline for comparison. A statewide baseline is provided by Georgia's water quality standards, which contain water use classifications, numeric standards for chemical concentrations, and narrative requirements for water quality.

Georgia's water use classifications and standards were first established by the Georgia Water Quality Control Board in 1966. The water use classification system was applied to interstate waters in 1972 by EPD. Table 5-2 provides a summary of water use classifications and basic water quality criteria for each water use. Georgia also has general narrative water quality standards, which apply to all waters. These narrative standards are summarized in Table 5-3.

In addition to the basic water quality standards shown above, Congress made changes in the Clean Water Act in 1987 which required each state to adopt numeric limits for toxic substances for the protection of aquatic life and human health. To comply with these requirements, in 1989 the Board of Natural Resources adopted 31 numeric standards for the protection of aquatic life and 90 numeric standards for the protection of human health. Appendix B provides a complete list of the toxic substance standards that apply to all waters in Georgia. Georgia has adopted all numeric standards for toxic substances promulgated by the US EPA. Georgia is also developing site-specific

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

	Bacteria (fecal coliform)		Dissolved Oxygen (other than trout streams)[1]		pH	Temperature (other than trout streams)[1]	
Use Classification	30-Day Geometric Mean[2] (MPN/100 ml)	Maximum (MPN./100 ml)	Daily Average (mg/l)	Minimum (mg/l)	Std. Units	Maximum Rise (°F)	Maximum (°F)
Drinking Water requiring treatment	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Recreation	200 (Freshwater) 100 Coastal)	--	5.0	4.0	6.0-8.5	5	90
Fishing Coastal Fishing[3]	1,000 (Nov-April) 200 (May-October)	4,000 (Nov-April)	5.0	4.0	6.0-8.5	5	90
Wild River	No alteration of natural water quality						
Scenic River	No alteration of natural water quality						

[1] *Standards for Trout Streams for dissolved oxygen are an average of 6.0 mg/l and a minimum of 5.0 mg/l. No temperature alteration is allowed in Primary Trout Streams and a temperature change of 2 °F is allowed in Secondary Trout Streams.*

[2] *Geometric means should be "based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours." The geometric mean of a series of N terms is the Nth root of their product. Example: the geometric mean of 2 and 18 is the square root of 36.*

[3] *Standards are same as fishing with the exception of dissolved oxygen which is site specific.*

Table 5-3. Georgia Narrative Water Quality Standards for All Waters (Excerpt from Georgia Rules and Regulations for Water Quality Control Chapter 391-3-6-.03 - Water Use Classifications and Water Quality Standards)

(5) General Criteria for All Waters. The following criteria are deemed to be necessary and applicable to all waters of the State:

(a) All waters shall be free from materials associated with municipal or domestic sewage, industrial waste or any other waste which will settle to form sludge deposits that become putrescent, unsightly or otherwise objectionable.

(b) All waters shall be free from oil, scum and floating debris associated with municipal or domestic sewage, industrial waste or other discharges in amounts sufficient to be unsightly or to interfere with legitimate water uses.

(c) All waters shall be free from material related to municipal, industrial or other discharges which produce turbidity, color, odor or other objectionable conditions which interfere with legitimate water uses.

(d) All waters shall be free from toxic, corrosive, acidic and caustic substances discharged from municipalities, industries or other sources, such as nonpoint sources, in amounts, concentrations or combinations which are harmful to humans, animals or aquatic life.

(e) All waters shall be free from turbidity which results in a substantial visual contrast in a waterbody due to man-made activity. The upstream appearance of a body of water shall be observed at a point immediately upstream of a turbidity-causing man-made activity. The upstream appearance shall be compared to a point which is located sufficiently downstream from the activity so as to provide an appropriate mixing zone. For land disturbing activities, proper design, installation and maintenance of best management practices and compliance with issued permits shall constitute compliance with [this] Paragraph...

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

5.2.2 Surface Water Quality Monitoring

EPD's monitoring program integrates physical, chemical, and biological monitoring to provide information for water quality and use attainment assessments and for basin planning. EPD monitors the surface waters of the state to:

- collect baseline and trend data,
- document existing conditions,
- study impacts of specific discharges,
- determine improvements resulting from upgraded water pollution control plants,
- support enforcement actions,
- establish wasteload allocations for new and existing facilities,
- verify water pollution control plant compliance,
- document water use impairment and reasons for problems causing less than full support of designated water uses, and
- develop Total Maximum Daily Loads.

EPD uses a variety of monitoring tools to collect information to determine if the waterbodies are supporting its designated uses. These tools include trend monitoring, intensive surveys, lake, coastal, biological, fish tissue, and toxic substance monitoring, and facility compliance sampling. Each of these is briefly described in the following sections.

Continuous Trend Monitoring

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

Today EPD contracts with the United States Geological Survey (USGS) for the majority of the trend sampling work. In addition to monthly stream sampling, a portion of the work with the USGS involves continuous monitoring at several locations across the state. EPD associates also collect water and sediment samples for toxic substance analyses, as well as macroinvertebrate samples to characterize the biological community at selected locations as a part of the trend monitoring effort. Additional samples used in the 1996-1997 assessment were collected by other federal, state, and local governments, universities, contracted Clean Lakes projects, and utility companies. Trend monitoring stations located in the Coosa River basin in 1994 are shown in Figure 5-1.

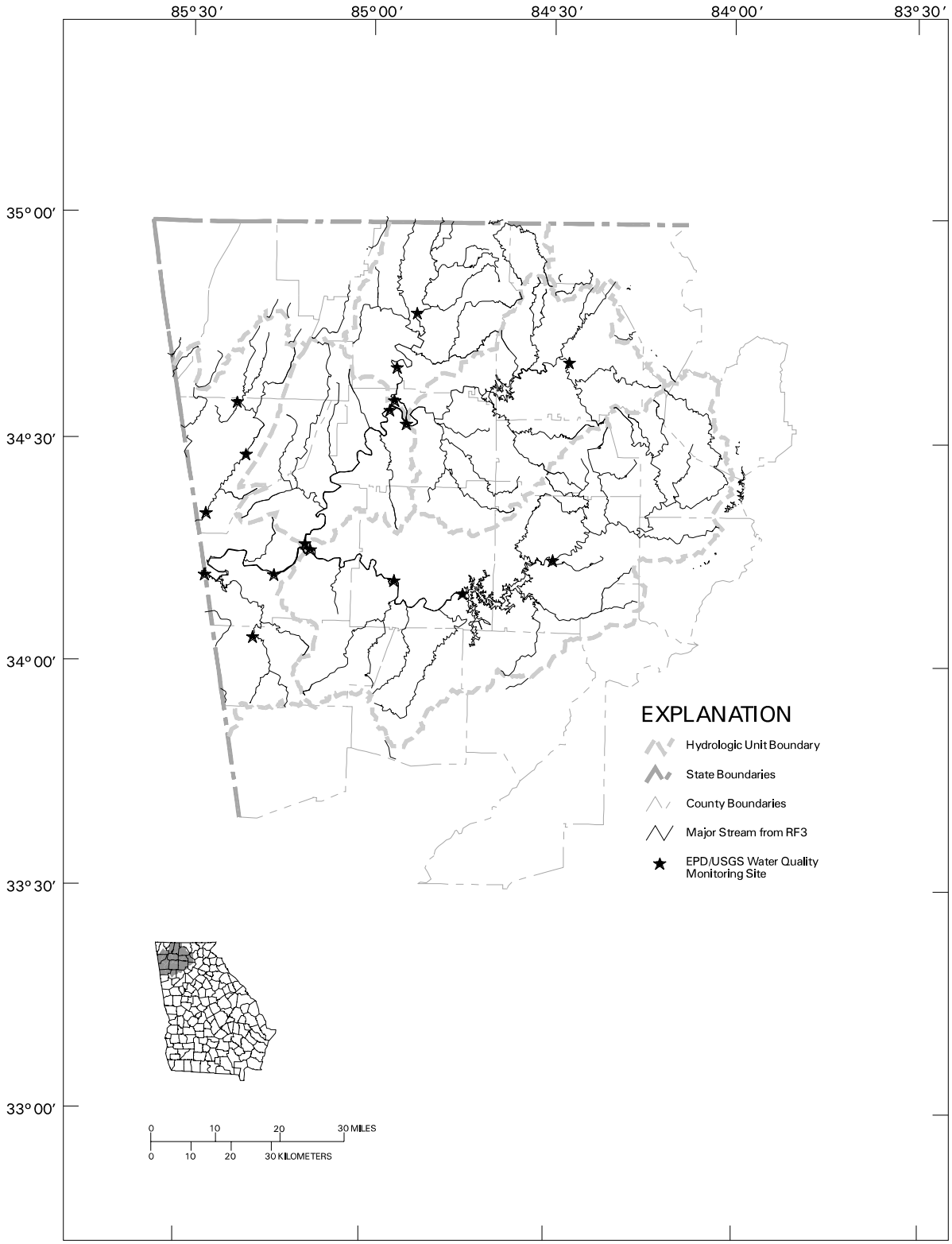

Figure 5-I. Coosa Basin Fixed Sampling Station Locations

Focused Trend Monitoring in the Coosa River Basin

In 1995, EPD adopted and implemented significant changes to the strategy for trend monitoring in Georgia. The changes were implemented to support the River Basin Management Planning program. The number of fixed stations statewide was reduced in order to focus resources for sampling and analysis in a particular group of basins in any one year in accordance with the basin planning schedule. Sampling focus was placed on the Coosa, Tallapoosa, and Oconee basins during the 1996 sampling.

Figure 5-2 shows the focused trend monitoring network for the Coosa basin used in 1996. During this period statewide trend monitoring was continued at the 37 core station locations statewide, in the Savannah Harbor, in the Chattahoochee at Atlanta and Columbus, and at continuous monitoring locations. The remainder of the trend monitoring resources were devoted to the Coosa, Tallapoosa and Oconee basins. As a result, more sampling was conducted in the focus river basins. Increasing the resolution of the water quality monitoring improves the opportunity to identify impaired waters, as well as the causes of impairment.

Intensive Surveys

Intensive surveys complement long-term fixed station monitoring to focus on a particular issue or problem over a shorter period of time. Several basic types of intensive surveys are conducted, including model calibration surveys and impact studies. The purpose of a model calibration survey is to collect data to calibrate a mathematical water quality model. Models are used for wasteload allocations and/or TMDLs and as tools for use in making regulatory decisions. Impact studies are conducted where information on the cause-and-effect relationships between pollutant sources and receiving waters is needed. In many cases biological information is collected along with chemical data for use in assessing environmental impacts.

Lake Monitoring

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

Trophic Condition Monitoring

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

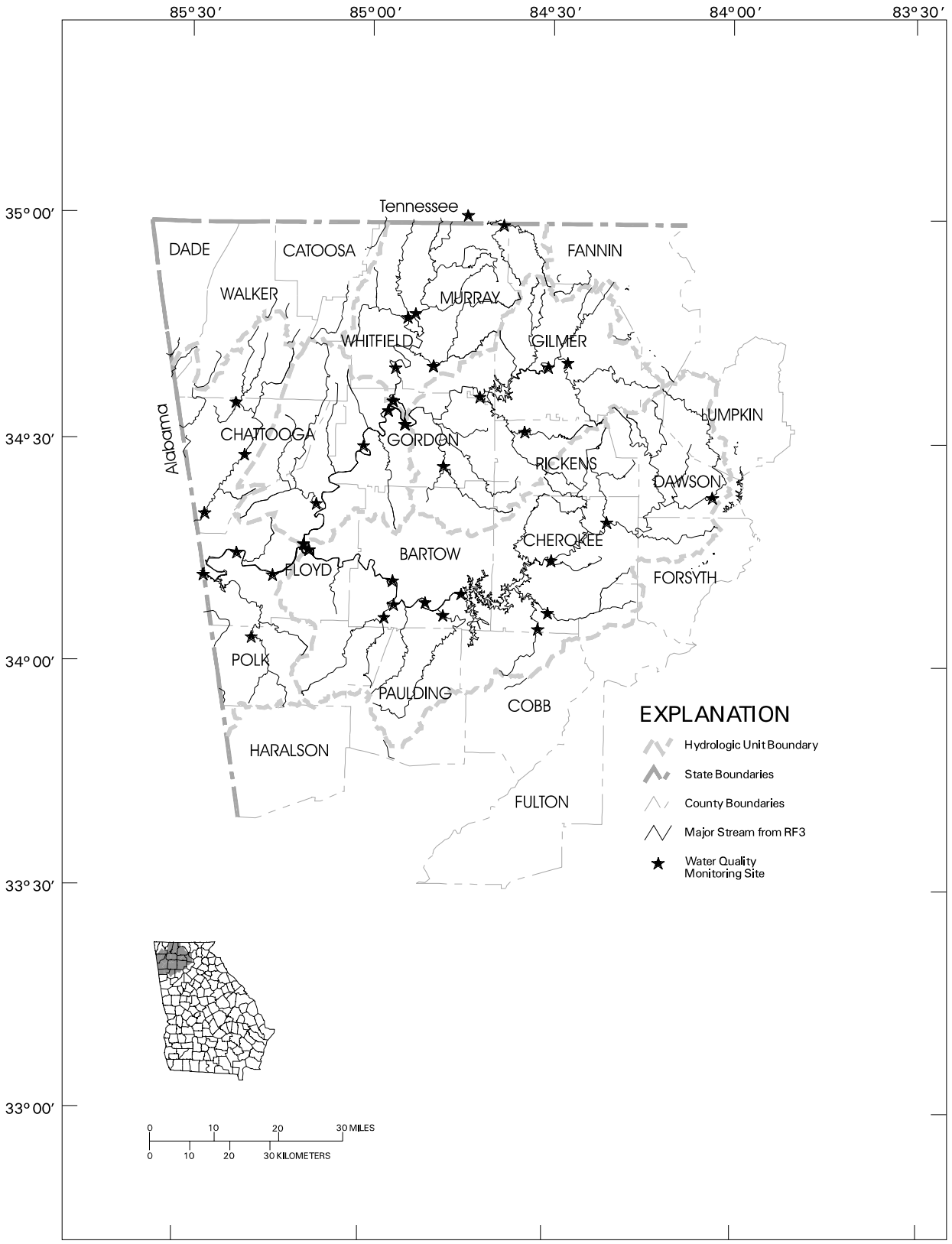

Figure 5-2. Coosa Basin Trend Monitoring Network Station Location, 1996

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

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

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

Note: Higher values represent more eutrophic conditions.

Fish Tissue Monitoring

The DNR conducts fish tissue monitoring for toxic chemicals and issues fish consumption guidelines as needed to protect human health. It is not possible for the DNR to sample fish from every stream and lake in the state. However, high priority has been placed on the 26 major reservoirs that make up more than 90 percent of the total lake acreage. These lakes will continue to be sampled as part of the River Basin Management Planning 5-year rotating schedule to track trends in fish contaminant levels. The DNR has also made sampling fish in rivers and streams downstream of urban and/or industrial areas a high priority. In addition, DNR will focus attention on areas frequented by a large number of anglers.

The program includes testing of fish tissue samples for the substances listed in Table 5-5. Of the 43 constituents tested, only PCBs, chlordane, and mercury have been found in fish at concentrations that could create risk to human health from fish consumption.

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

PCBs in Fish in the Coosa River

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

Table 5-5. Parameters for Fish Tissue Testing

Antimony	a-BHC	Heptachlor
Arsenic	b-BHC	Heptachlor Epoxide
Beryllium	d-BHC	Toxaphene
Cadmium	g-BHC (Lindane)	PCB-1016
Chromium, Total	Chlordane	PCB-1221
Copper	4,4-DDD	PCB-1232
Lead	4,4-DDE	PCB-1242
Mercury	4,4-DDT	PCB-1248
Nickel	Dieldrin	PCB-1254
Selenium	Endosulfan I	PCB-1260
Silver	Endosulfan II	Methoxychlor
Thallium	Endosulfan Sulfate	HCB
Zinc	Endrin	Mirex
Aldrin	Endrin Aldehyde	Pentachloroanisole
		Chlorpyrifos

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

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

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

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

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

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

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

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

Toxic Substance Stream Monitoring

EPD has focused resources on the management and control of toxic substances in the state's waters for many years. Toxic substance analyses have been conducted on samples from selected trend monitoring stations since 1973. Wherever discharges were found to have toxic impacts or to include toxic pollutants, EPD has incorporated specific limitations on toxic pollutants in NPDES discharge permits.

In 1983 EPD intensified toxic substance stream monitoring efforts. This expanded toxic substance stream monitoring project includes facility effluent, stream, sediment, and fish sampling at specific sites downstream of selected industrial and municipal discharges. From 1983 through 1991, 10 to 20 sites per year were sampled as part of this project. During recent years, this effort was reduced significantly due to use of limited laboratory resources for different types of analysis. Future work will be conducted as a part of the River Basin Management Planning process.

Facility Compliance Sampling

In addition to surface water quality monitoring, EPD conducts evaluations and compliance sampling inspections of municipal and industrial water pollution control plants. Compliance sampling inspections include the collection of 24-hour composite samples, as well as an evaluation of the permittee's sampling and flow monitoring requirements.

More than 270 sampling inspections were conducted by EPD staff statewide in 1996-1997. The results were used, in part, to verify the validity of permittee self-monitoring data and as supporting evidence, as applicable, in enforcement actions. Also, sampling

inspections can lead to identification of illegal discharges. In 1996, this work was focused on facilities in the Coosa, Tallapoosa, and Oconee River basins in support of the basin planning process.

Aquatic Toxicity Testing

In 1982 EPD incorporated aquatic toxicity testing into selected industrial NPDES permits. In January 1995, EPD issued approved NPDES Reasonable Potential Procedures, which further delineated required conditions for conducting whole effluent toxicity (WET) testing for municipal and industrial discharges. All major permitted dischargers (flow greater than 1 MGD) are required to have WET tests run with each permit reissuance. Certain minor dischargers are also subject to this requirement if EPD determines that aquatic toxicity is a potential issue.

5.2.3 Data Analysis

Assessment of Use Support

EPD assesses water quality data to determine if water quality standards are met and if the waterbody supports its classified use. If monitoring data show that standards are not achieved, depending on the frequency with which standards are not met, the waterbody is said to be not supporting or partially supporting the designated use (see box).

Appendix E includes lists of all streams and rivers in the basin for which data have been assessed. The lists include information on the location, data source, designated water use classification, criterion violated, potential cause, actions planned to alleviate the problem, and estimates of stream miles affected. The lists are further coded to indicate status of each waterbody under several sections of the Federal Clean Water Act (CWA). Different sections of the CWA require states to assess water quality (Section 305(b)), to list waters still requiring TMDLs (Section 303(d)), and to document waters with nonpoint source problems (Section 319).

The assessed waters are described in three categories—waters supporting designated uses, waters partially supporting designated uses, and waters not supporting designated uses. Waters were placed on the partially supporting list for at least one of the following reasons:

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

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

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

Analysis of data for fecal coliform bacteria, metals, toxicity, dissolved oxygen, fish/shellfish consumption advisories, and biotic data.

Fecal Coliform Bacteria

Georgia water quality standards establish a fecal coliform criterion of a geometric mean (four samples collected over a 30-day period) of 200 MPN/100 mL for all waters in Georgia during the recreational season of May through October. This is the year-round standard for waters with the water use classification of recreation. Although the standard is based on a geometric mean, most of the data for Georgia and other states is based on once per month sampling since resources are not available to conduct sampling and analysis four times per month. Thus, for the purposes of this report US EPA recommends the use of a review criterion of 400 MPN/100 mL to evaluate once per month sample results.

This density, 400 MPN/100 mL, was used to evaluate data for the months from May through October for all waters. For waters with the water use classification of recreation, this guidance criterion was used to evaluate data for the entire year. For waters classified as drinking water, fishing, or coastal fishing, the maximum Georgia standard for fecal coliform bacteria is 4000 MPN/100 mL (November through April). This standard was used to evaluate data collected during November through April for these waters. Waters were deemed not supporting uses when 25 percent of the samples had fecal coliform bacteria densities greater than the applicable review criteria (400 or 4000 MPN/100 mL) and partially supporting when 11 to 25 percent of the samples were in excess of the review criterion.

Metals

Since data on metals from any one given site are typically infrequent, using the general evaluation technique of 25 percent excursion to indicate nonsupport and 11to 25 percent excursion to indicate partial support was not meaningful. Streams were placed in the nonsupporting category if multiple excursions of state criteria occurred and the data were based on more than four samples per year. With less frequent sampling, streams with excursions were placed on the partially supporting list. In addition, an asterisk appears beside metals data in those cases where there is a minimal database. A number of stream segments were listed based on one data point's exceeding a water quality standard. This approach is in accordance with US EPA guidance, which suggests any single excursion of a metals criteria be listed.

Toxicity Testing/Toxic Substances

Data from EPD toxicity testing of water pollution control plant effluents were used to demonstrate or predict toxicity in the receiving waterbody. Based on the effluent toxicity, receiving waters were considered as not supporting when one or more tests gave a clear indication of instream toxicity and as partially supporting when based on predicted instream toxicity. Effluent data for toxic substances were used to designate either partial support or nonsupport based on whether instream corroborating data were available. When instream data were available, the stream was determined to be not supporting; when instream data were not available, the stream was listed as partially supporting.

Dissolved Oxygen, pH, Temperature

When available data indicated that these parameters were out of compliance with state standards more than 25 percent of the time, the waters were evaluated as not supporting the designated use. Between 11 percent and 25 percent noncompliance resulted in a partially supporting evaluation.

Fish/Shellfish Consumption Guidelines

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

Biotic Data

A "Biota Impacted" designation for "Criterion Violated" indicates that studies showed a modification of the biotic community. Communities used were fish. Studies of fish populations by the DNR Wildlife Resources Division used the Index of Biotic Integrity (IBI) to identify affected fish populations. The IBI values were used to classify the population as Excellent, Good, Fair, Poor, or Very Poor. Stream segments with fish populations rated as "Poor" or "Very Poor" were included in the partially supporting list.

5.2.4 Assessment of Water Quality and Use Support

This section provides a summary of the assessment of water quality and support of designated uses for streams and major lakes in the Coosa River basin. Most of these results were previously summarized in the report *Water Quality in Georgia, 1996-1997* (Georgia DNR, 1998). Results are presented by HUC. A geographic summary of assessment results is provided by HUC in Figures 5-3 through 5-7.

Conasauga River Basin (HUC 03150101)

Appendix E, Table E-1 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998). Monitoring data were collected from 7 trend monitoring stations located within this subbasin during the 1996 period, four of which were on the mainstem. Historically, three trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected by both point and nonpoint source pollution.

Metals

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

Bacteria

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

Toxicity

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

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

Guidelines for eating fish from this section of the Coosa River basin are listed in the following tables. The data shown in these tables are the new guidance published in the *1998-99 Georgia Sport Fishing Regulations* and *1998 Guidelines for Eating Fish from Georgia Waters* booklet. This guidance is based on the EPA risk-based management approach and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

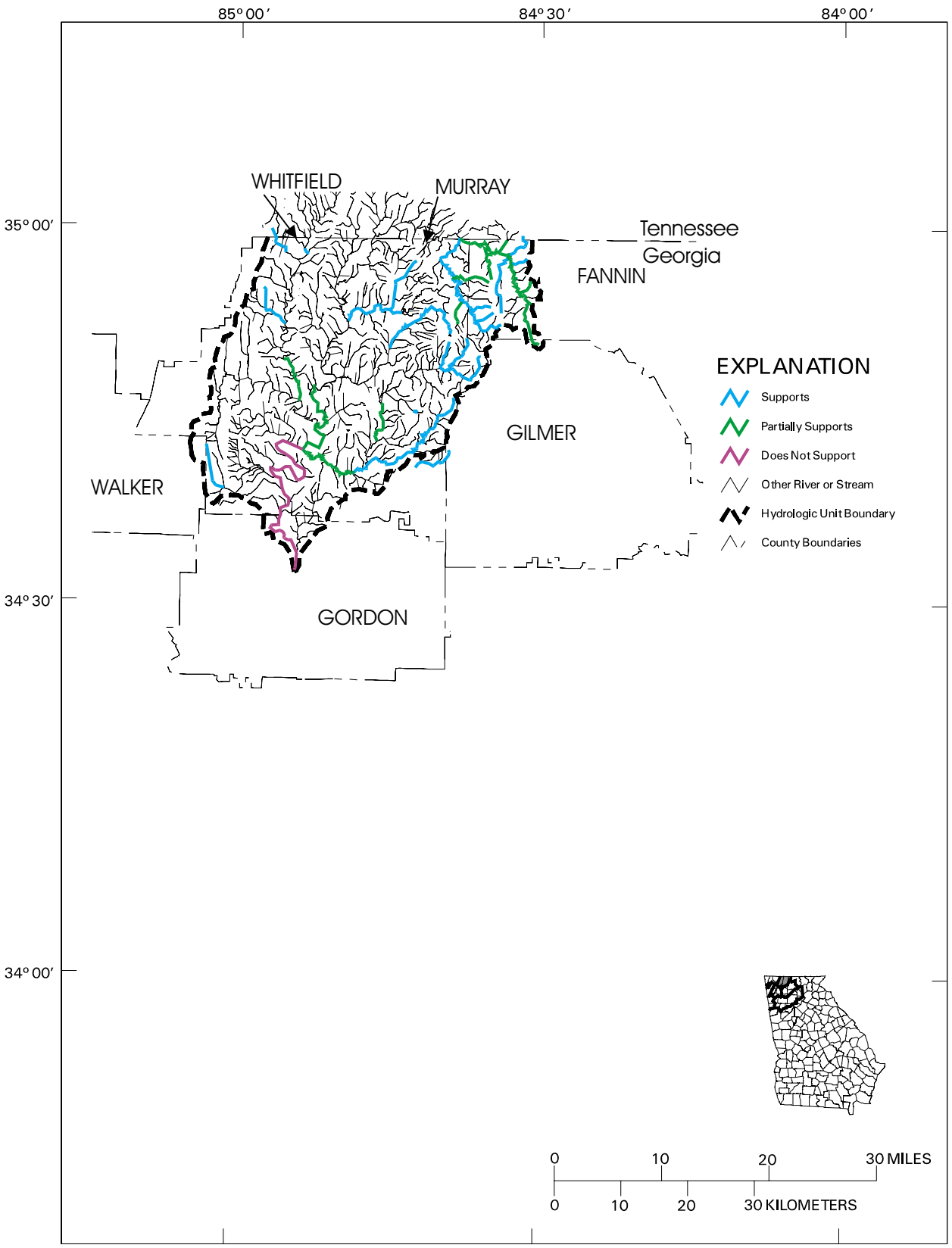

Figure 5-3. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150101

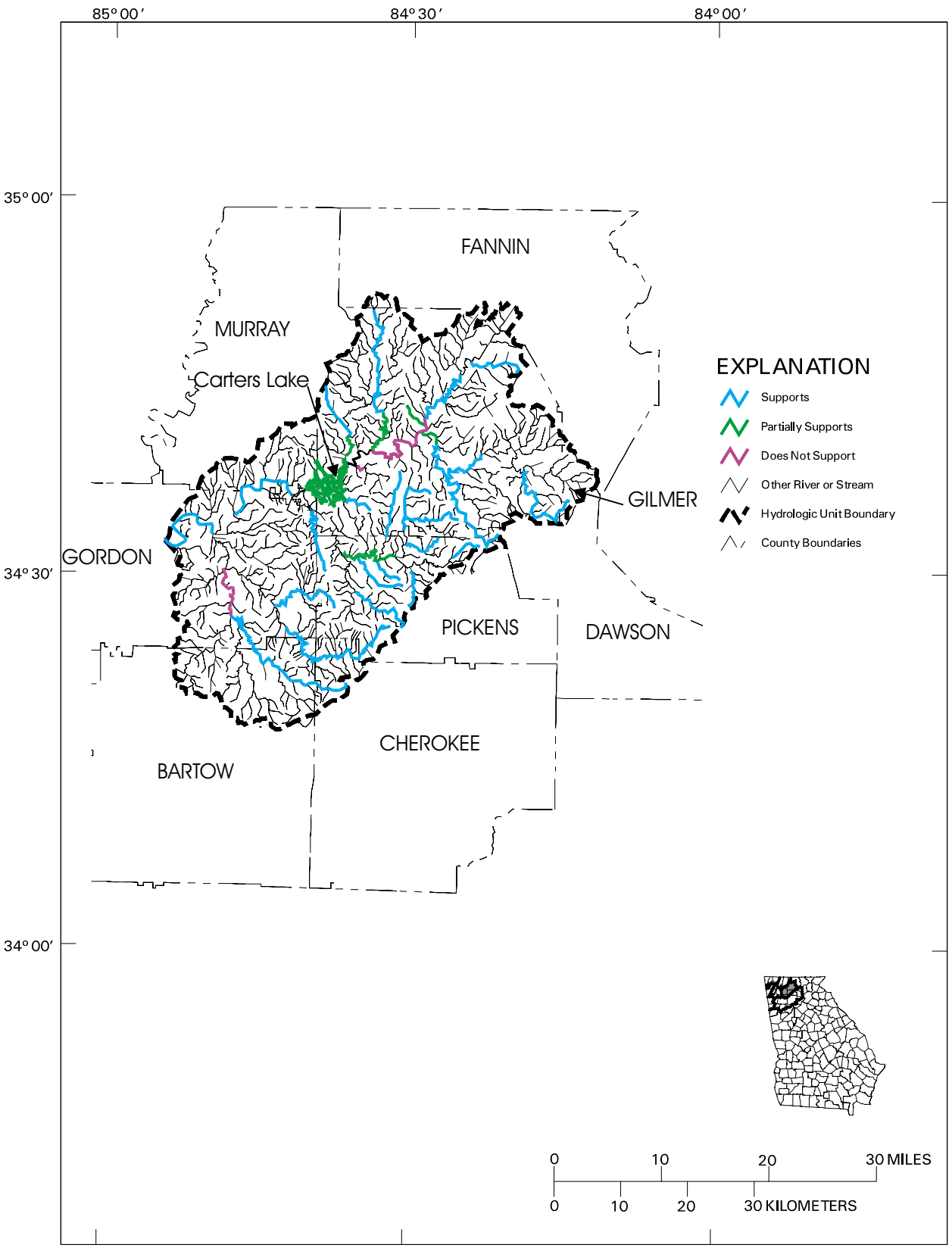

Figure 5-4. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150102

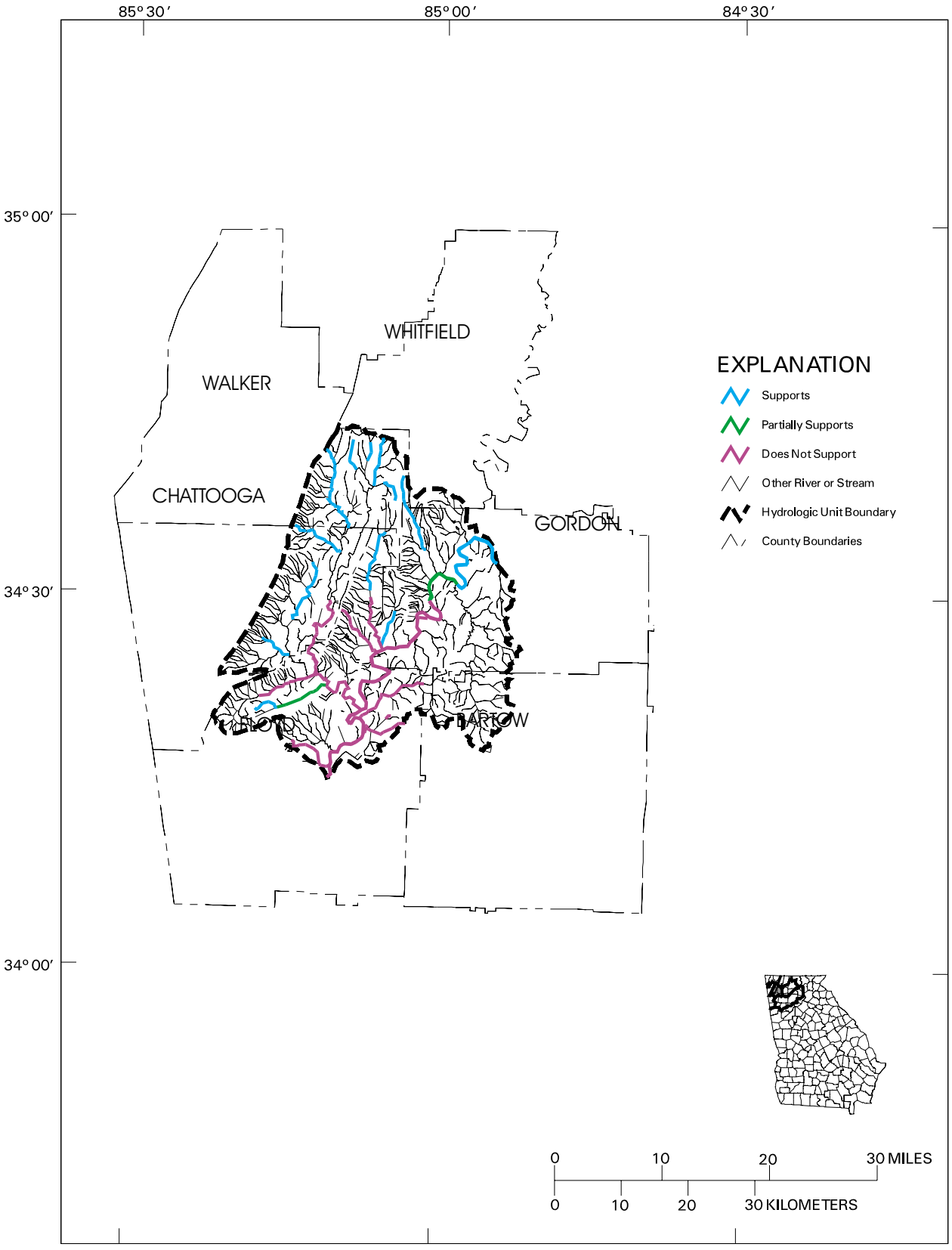

Figure 5-5. Assessement of Water Quality Use Support in the Coosa River Basin, HUC 03150103

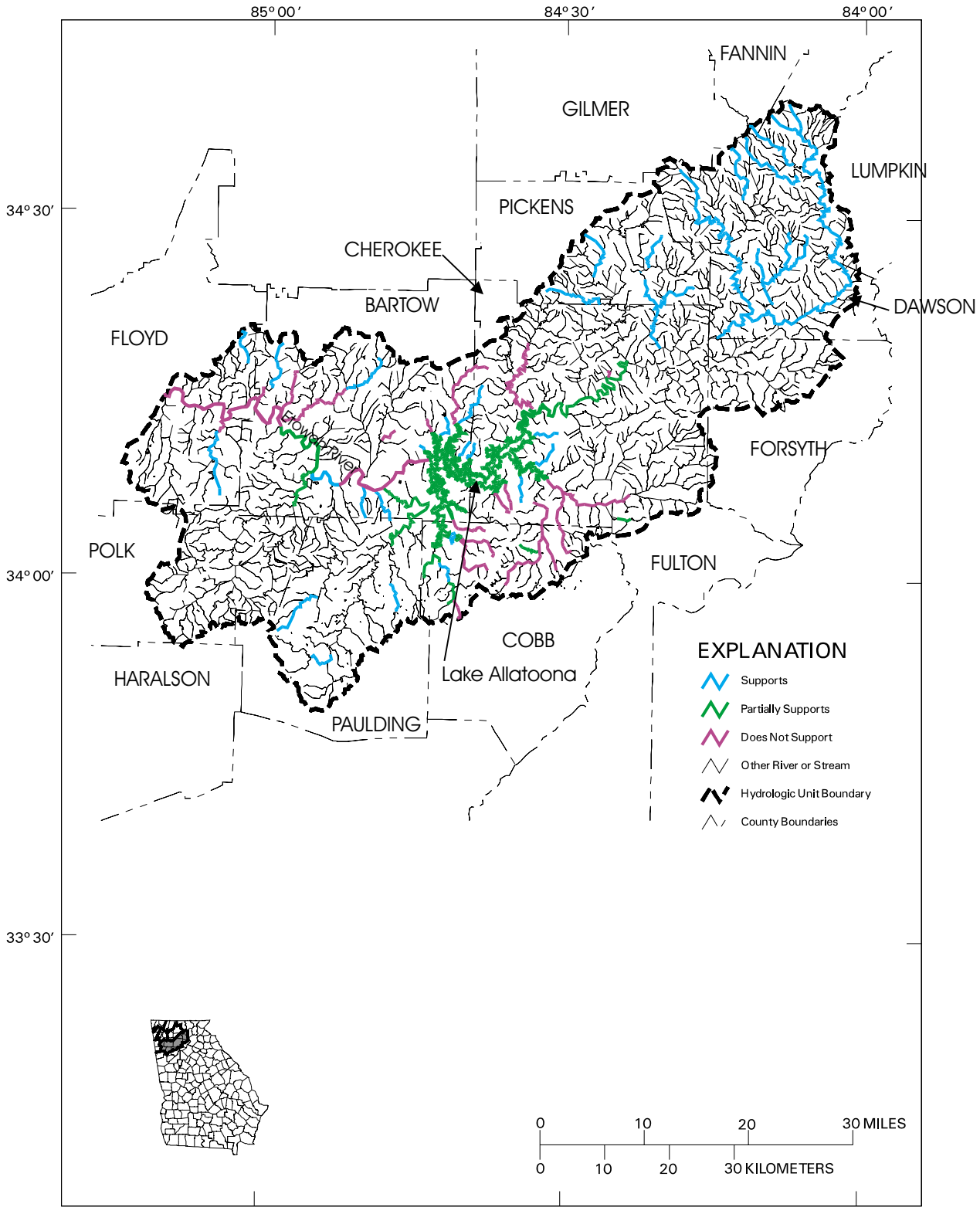

Figure 5-6. Assessement of Water Quality Use Support in the Coosa River Basin, HUC 03150104

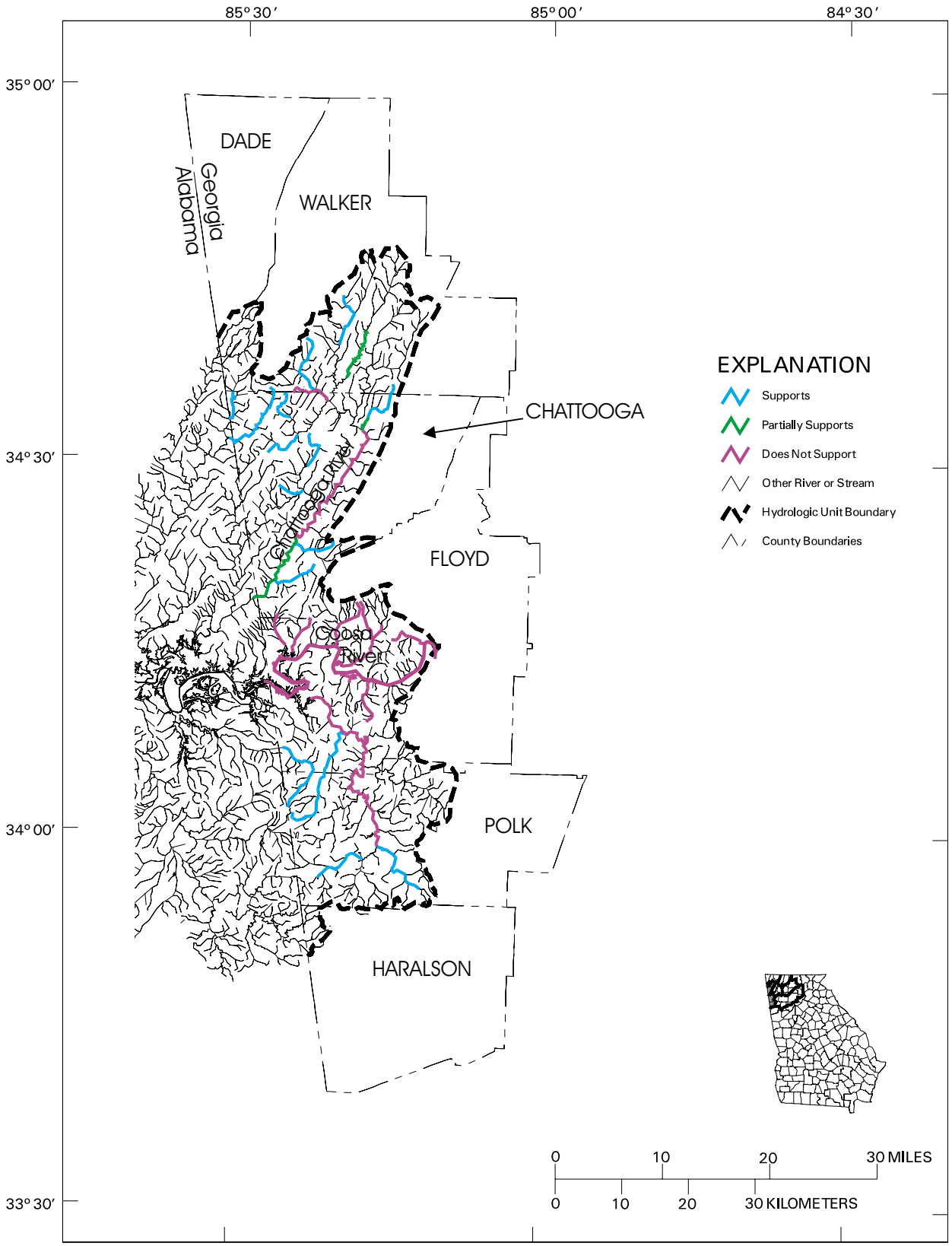

Figure 5-7. Assessment of Water Quality Use Support in the Coosa River Basin, HUC 03150105

Fish Consumption Guidelines–Jacks River: Fannin County

Species	Site Tested	Recommendation	Chemical
Brown Trout	Watson Gap	No Restrictions	

Fish Consumption Guidelines–Swamp Creek: Whitfield County

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

Coosawattee River Basin: Streams and Rivers (HUC 03150102)

Appendix E, Table E-2 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998).

Monitoring data were collected from 6 trend monitoring stations located within this subbasin during the 1996 period, three of which were on the mainstem. Historically, two trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations, as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected primarily by nonpoint source pollution.

Bacteria

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

Toxicity

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

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

Fish tissue quality in Carters Lake has been found to be very good, with one recommended consumption limit on large walleye over 16 inches in length due to the tissue mercury content. Current guidelines for eating fish from Carters Lake and this section of the Coosa River Basin are listed in the following tables. Talking Rock Creek flows into the pump-storage reregulation reservoir located at Carters Lake. The data shown in these tables are the new guidance which was published in the 1998-99 Georgia Sport Fishing Regulations and 1998 Guidelines for Eating Fish from Georgia Waters booklet. This guidance is based on the EPA risk-based management approach and combines historical fish tissue data with data from the 1995 and 1996 fish tissue collections to produce the new guidance. The guidance is revised each year if new data collected warrant a change.

Fish Consumption Guidelines–Carters Lake

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

Fish Consumption Guidelines–Talking Rock Creek: Pickens County

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

Coosawattee River Basin: Lakes (HUC 03150102)

Carters Lake

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

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

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

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

Oostanaula River Basin (HUC 03150103)

Appendix E, Table E-3 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998).

Monitoring data were collected from four trend monitoring stations located within this subbasin during the 1996 period, three of which were on the mainstem. Historically, two trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected primarily by nonpoint source pollution.

Metals

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

Bacteria

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

Toxicity

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

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

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

Fish Consumption Guidelines–Carters Lake Ponder Branch: Walker County

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

Fish Consumption Guidelines–Oostanaula River

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

Etowah River Basin: Streams and Rivers (HUC 03150104)

Appendix E, Table E-4 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998). Monitoring data were collected from 12 trend monitoring stations located within this subbasin during the 1996 period, seven of which were on the mainstem. Historically, five trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected primarily by nonpoint source pollution.

Metals

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

Bacteria

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

Toxicity

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

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban

runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

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

Fish Consumption Guidelines–Etowah River: Above Lake Allatoona

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

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

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

Fish Consumption Guidelines–Stamp Creek: Cherokee County

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

Etowah River Basin: Lakes (HUC 03150104)

Lake Allatoona

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

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

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

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

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

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

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

Fish Tissue Quality

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

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

Fish Consumption Guidelines–Lake Allatoona

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

Lake Acworth

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

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

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

Appendix E, Table E-5 summarizes the determination of support for designated uses of all assessed rivers and streams within this hydrologic unit (GA DNR, 1998). Monitoring data were collected from 7 trend monitoring stations located within this subbasin during the 1996 period, three of which were on the Coosa mainstem and two of which were on the Chattooga mainstem. Historically, six trend monitoring stations have been sampled within this basin. The following assessment is based on data from these trend monitoring stations as well as data from EPD special studies (e.g., intensive surveys) and samples collected by other agencies.

Data from the mainstem stations indicate that water quality conditions are being affected by both point and nonpoint source pollution.

Metals

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

Bacteria

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

Toxicity

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

Erosion and Sedimentation

The water use classifications of fishing, recreation, and drinking water are potentially threatened in waterbodies by erosion and loading of sediment, which can alter stream morphology, impact habitat, and reduce water clarity. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

Fish Tissue Quality

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

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

Fish Consumption Guidelines–Coosa River

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

Fish Consumption Guidelines–Chattooga River

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

5.2.5 Assessment of Fish and Wildlife Resources

Detailed, HUC-level assessments of fish and wildlife resources in the Coosa River basin were not available at the time of compilation of the basin plan. However, rough, basin-scale assessments of fish and wildlife resources have been developed as part of the RiverCare 2000 Georgia Rivers Assessment (EPD, 1998). These results are summarized below.

Ecologically Important Fish Resources

Georgia's fishery resources depend on healthy streams and are part of a diverse community of game and nongame species. These communities by definition include vertebrates like fishes and invertebrates like mussels and aquatic insects. A complete community with all species that naturally occur in a particular river system is irreplaceable. Only a few species can be propagated and restocked into nature. The life found in a Georgia river depends absolutely on the integrity of aquatic habitat, which in turn directly reflects the conditions within the rivers' entire upstream watersheds. Healthy aquatic ecosystems can provide sustainable commercial and recreational fisheries which are valuable in their own right. The secondary effects often associated with the pursuit of these fisheries adds even more value to Georgia's local economies.

The Georgia Rivers Assessment work group evaluated river segments and associated tributaries according to the composition of fish and mussel species, the quality of habitat, and the characteristics of the particular fishery. The assessment considered chiefly those

river corridors lying downstream of the point at which the rivers attained an average annual discharge of 400 cfs. However, portions of ecologically valuable rivers that might have a smaller average annual flow than 400 cfs were also evaluated, including Conasauga and Jacks Rivers downstream of Tennessee Highway 74, and Coosawattee River system above Carters Lake.

The work group established three value classes to rank river segments:

Superior	Non-regulated stream, near wilderness, not immediately influenced by large municipalities, may contain important faunal assemblages.
Outstanding	Non-regulated stream with important faunal assemblages or important habitats.
Significant	Can include regulated stream reaches with important faunal assemblages or important habitats.

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

The major threats to ecologically important fish resources come from nonpoint source pollution and the effects of other human activities in the environment. Clearing vegetation, disturbing earth without adequately controlling the movement of sediment, increasing impervious surface, and related activities in a watershed can alter water quality and patterns of stream discharge. Altering river channels, by dredging or by removing snags that furnish many prey organisms for fish, also reduces the quality and quantity of fish habitat. These activities lower the value of streams for fish populations.

Another significant threat to Georgia's fish species is the introduction of exotic, or foreign, species. Many introduced species, such as flathead catfish, compete with native fish for food and cover, take them as food, or parasitize them. If the new species are so successful that they reduce or eliminate the native population, they can significantly reduce the river's fishery biodiversity as well.

Recreational and Commercial Fish Resources

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

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

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

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

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

Wildlife Resources

Wildlife enriches humans aesthetically and spiritually, can serve as an indicator of environmental health, provide food and pollination services, and may be a source of pharmaceutical chemicals. Predators, such as hawks and foxes, keep in check populations of mice, rats, and other animals that are considered agricultural pests.

Wildlife also provides recreation to the many people who enjoy watching wildlife or hunting. According to recent surveys, 82 percent of Georgians actively observe wildlife or hunt. These activities generate economic activity from the sale of hunting licenses; of equipment and supplies used to identify, hunt, feed, and watch wildlife; and of services such as food, lodging, outdoor guides, and the maintenance and repair of equipment used in wildlife-oriented recreation.

The Georgia Rivers Assessment Wildlife Resources Work Group evaluated wildlife habitat quality, which it defined to include the expected or observed diversity of wildlife species within the river corridor, and the general condition of terrestrial and wetland habitats within the river corridor. The area under consideration included the stream channel and adjoining lands within 3.1 miles of the riverbank. The work group defined high-quality wildlife resource areas as those which provide habitat for a high diversity of wildlife species. These areas may include habitat that has declined significantly or is rare, or that supports species of special conservation concern. The assessment was limited to perennial streams downstream of the point at which the stream reaches an average annual discharge of 400 cfs or greater.

The evaluation criteria placed equal emphasis on four measures of wildlife resource quality, each of which contributed a maximum of 25 points to a river segment's final score:

- Diversity of species and natural habitats in the river corridor
- Habitat value for species of special concern
- Percentage of river corridor in natural vegetation
- Habitat fragmentation in the river corridor

Segments were rated as Superior (80 to 100 points.), Outstanding (61 to 79 points), Significant (41 to 60 points), and Other (less than 41 points). Within the Coosa River basin 414 miles of river corridor were rated as Significant. No segments were rated as Superior or Outstanding.

The major threats to wildlife resources are a variety of land-use changes, including residential, industrial, silvicultural, and agricultural development. The effects on wildlife resources vary, both quantitatively and qualitatively, depending on the types of land use in a region, the types of natural habitats present, and the amount of development. Changes to native wildlife populations resulting from the conversion of natural forest habitat to short-rotation silvicultural stands are perhaps less obvious than those resulting from conversion to intensive agricultural or industrial use, but are nonetheless significant. Overall, the trends for wildlife habitat quality in Georgia's river corridors include

continued fragmentation of natural habitats, loss of forestred riparian buffers, and increasing prevalence of disturbed and early-successional plant and animal communities.

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

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