

Section 7

Implementation Strategies

The Statement of Mission for Georgia's River Basin Management Planning (see Figure 1-1) is:

To develop and implement a river basin planning program to protect, enhance, and restore the waters of the State of Georgia, that will provide for effective monitoring, allocation, use, regulation, and management of water resources.

Associated with this mission are a variety of goals which emphasize coordinated planning to meet all applicable local, state, and federal laws, rules, and regulations, and provide for water quality, habitat, and recreation. For the Chattahoochee basin, these goals will be implemented through a combination of a variety of general strategies, which apply across the basin and across the state, and targeted or site-specific strategies. Section 7.1 describes the general and basin-wide implementation strategies of most relevance to the Chattahoochee River basin management plan. Targeted strategies for specific priority concerns within each sub-basin, as identified in Section 6, are then presented in Section 7.2.

7.1 General/Basin-Wide Management Strategies

7.1.1 General Surface Water Protection Strategies

Antidegradation

The State of Georgia considers all waters of the State as high quality and applies a stringent level of protection for each waterbody. Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6-03(2)(b) contains specific antidegradation provisions as follows:

(b) Those waters in the State whose existing quality is better than the minimum levels established in standards on the date standards become effective will be maintained at high quality ; with the State having the power to authorize new developments, when it has been affirmatively demonstrated to the State that a change is justifiable to provide necessary social or economic development and provided further that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses. Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. All requirements in the Federal Regulations, 40 C.F.R. 131.12, will be achieved before lowering of water quality is allowed for high quality water.

The antidegradation review process is triggered at such time as a new or expanded point source discharge is proposed that may have some effect on surface water quality. Such proposals are reviewed to determine if the new discharge is justifiable to provide necessary social or economic development and that the level of treatment required is the highest and best practicable under existing technology to protect existing beneficial water uses.

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a “no-discharge” land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Water Supply Watershed Protection Strategy

EPD is acting in concert with the Department of Community Affairs to produce a set of “guidelines” which define, among other things, measures that local governments are encouraged to take to protect drinking water sources. The “guidelines” are entitled Rules for Environmental Planning Criteria, and establish environmental protection criteria for five environmental categories: water supply watersheds, groundwater recharge areas, mountains, river corridors and wetlands. The Criteria for Watershed Protection (a sub-section of the Rules for Environmental Planning Criteria) set minimum guidelines for protection of watersheds above “governmentally owned” water supply intakes. The degree of protection depends upon the size of the watershed; watersheds with drainage areas of less than 100 square miles are subject to more strict criteria as summarized below:

- Impervious surface densities limited to 25% over the entire watershed.
- Buffer/setback requirements equal to 100/150 feet within seven (7) mile radius of the intake and 50/75 feet outside the seven (7) mile radius; and
- A reservoir management plan (including 150 foot buffer around the perimeter of the reservoir).

Watersheds with drainage areas of 100 square miles or more are subject to less strict criteria as summarized below:

- An intake on a flowing stream (as opposed to being located within a reservoir) shall have no specified minimum criteria; and
- An intake with a water supply reservoir shall have a minimum of 100 feet natural buffer within a seven mile radius of the reservoir, and no impervious cover constructed within a 150 foot setback area on both banks of the stream.

As population continues to dramatically increase within the Chattahoochee River basin, it will become ever more important to protect the water quality of already developed raw water sources. It is therefore necessary and appropriate to prepare and implement water supply watershed protection plans for each water supply watershed of 100 square miles or less within the Chattahoochee River basin.

Development of A Series of Watershed Protection Templates

Through funding provided by EPA under the provisions of the 1996 Amendments to the Safe Drinking Water Act, EPD will hire one or more consulting firms to study the morphological characteristics of a yet to be determined number of water supply watersheds in Georgia, and develop suites of non-structural (e.g., land use decisions) and structural (e.g., wet detention ponds) measures that might be employed in each of these watersheds to protect the integrity of the raw water at the current or future surface water sources. The watersheds selected for study

will capture a broad range of watershed characteristics (e.g., soil types, current and expected land use patterns, average slope of the watershed). When the studies are completed, the results will be evaluated and integrated to develop a set of water supply watershed protection templates that would be used to assist local governments with developing protection plans for their water supply sources.

Implementation of Provisions of 1996 Amendments to Safe Drinking Water Act

The 1996 Amendments to the Safe Drinking Water Act set a target of development of Source Water Assessment Plans (SWAP) and implementation of Source Water Protection plans (SWP) for 60 percent of the state's population by 2004. The SWAPs will essentially identify the more likely sources of contamination of the water supply in the watershed, and the SWPs will define a watershed-wide strategy for prevention (or minimization) of contamination. EPD is developing a strategy for realizing this target. While development of this strategy is in its infancy, the most crucial element of the implementation of the strategy will be extensive work with watershed-specific focus groups.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act (CWA) establishes the TMDL, or total maximum daily load, process as a tool to implement water quality standards. Georgia is required by the CWA to identify and list waterbodies where water quality standards are not met following the application of technology based controls, and to establish TMDLs for the listed stream segments. The U.S. Environmental Protection Agency (EPA) is required to approve or disapprove Georgia's 303(d) list of waters and TMDLs.

The most recent requirement for 303(d) list submittal occurred in 1996. Georgia submitted a draft 303(d) list to the USEPA in February 1996. The EPA reviewed the Georgia submittal and provided comments in March, 1996. Georgia submitted a final 303(d) listing to the EPA on April 1, 1996. The EPA approved the Georgia 303(d) list on May 2, 1996.

Georgia's 1996 303(d) listing is based on the Georgia 305(b) water quality assessments. The 305(b) assessment is presented in the report *Water Quality in Georgia, 1995-1996*. The 305(b) assessment tables are reprinted in Appendix E of this report. The tables provide a code indicating the 303(d) listing status of assessed segments within the Chattahoochee River basin. An explanation of the codes is given below. An "X" in the 303(d) column indicates the segment is on the Georgia 303(d) list.

- 1 Segments identified as not supporting or partially supporting designated uses where actions have been taken and compliance with water quality standards achieved. These segments are not part of the Georgia 303(d) list.
- 2 Segments identified as not supporting or partially supporting designated uses where existing enforceable State, local, or Federal requirements are expected to lead to attainment of water quality standards without additional control strategies. These segments are not part of the Georgia 303(d) list.
- X Waters with active 303(d) status. These segments are assessed as not supporting or partially supporting designated uses, and may require additional controls to achieve designated uses. These segments make up the Georgia 303(d) list.
- NA Waters assessed as supporting designated uses.

Georgia will address a number of the listed waters in the 1997-1998 time period, however, the majority of work on segments in the Chattahoochee River will be addressed in the second round of basin planning. The second round of basin planning for the Chattahoochee River will begin in 1999 and the river will be the focus of monitoring in the year 2000. Significant efforts will be made to assess the condition of the listed 303(d) waters at that time and results of the assessments will dictate the areas where TMDLs will be developed.

7.1.2 Management of Permitted Point Sources

The strategies in this section strive to minimize adverse effects from municipal, industrial, and concentrated stormwater discharges. Permitted discharges of treated wastewater are managed via the National Pollutant Discharge Elimination system (NPDES) permit program. The NPDES permit program provides a basis for regulating municipal and industrial discharges, monitoring compliance with effluent limitations, and initiating appropriate enforcement action for violations. EPD has formulated general strategies for a number of types of environmental stressors under the NPDES program.

Analysis of Alternatives

Applicants for new or expanded point source discharges into any surface water must perform an alternative analysis comparing the proposed discharge alternative to a "no discharge", land application or urban reuse alternative. The application for discharge to surface waters will only be considered if the less degrading alternatives are determined to be economically or technically infeasible. In all cases, existing instream water uses and the level of water quality necessary to protect the existing use shall be maintained and protected.

Permit Issuance/Reissuance Strategies

During the basin plan implementation phase, issues identified in the written basin plan pertaining to point source discharges will be assessed. The assessment will include such things as 1) identified point source discharge problem areas, 2) data evaluations, 3) wasteload allocations and/or TMDLs with identified problem point sources, and 4) toxics identified with point source discharges. Permits associated with identified problems will be evaluated to determine if a reopening of the permit is appropriate to adequately address the problem.

Facility Construction/Improvements

EPD has promoted continuing improvement in the quality of return flows from permitted point sources in the basin. Upgrading wastewater treatment facilities is a significant strategy to meet effluent limits from discharges. In the past ten years, various upgrades and improvements have been made to industrial and municipal treatment systems throughout the Chattahoochee River basin. The funding for these projects has come from state and federal construction grants and the citizens of local municipalities. Appendix C provides detailed information on expenditures by city and county governments on upgrading wastewater treatment facilities.

Domestic Wastewater Systems

The collecting, treating and disposing of wastewater in Georgia is regulated by a number of environmental laws that are administered by various agencies in local and state government. When a local government or private concern (owner) identifies a need for a wastewater treatment and disposal system it is imperative that thorough and adequate planning take place. Wastewater systems that discharge treated wastewater to a surface stream must be permitted through the federal National Pollution Discharge Elimination System (NPDES) and meet all the

requirements of that system. In Georgia, with very few exceptions, surface discharge permits will only be issued to publicly owned systems.

Wastewater systems that do not result in a discharge to surface waters, such as slow rate land treatment systems and urban reuse systems (no discharge), are permitted through the State of Georgia's land application system (LAS) permitting process. Both publicly and privately owned systems can apply for and receive LAS permits.

Chlorine

If a chlorine limit is not already required in an NPDES permit, all major municipal wastewater facilities (i.e., those with design flows greater than or equal to 1.0 million gallons per day [MGD]) are required to meet a chronic toxicity-based chlorine limitation when the permit comes up for routine reissuance. The limitation is calculated based on a maximum instream concentration of 0.011 mg/l, the facility's design flow, and the 7Q10 low flow of the receiving stream. No facilities are given a limitation higher than 0.5 mg/l as this is deemed to be an operationally achievable number even if a facility does not have dechlorination equipment installed. Facilities which are given a limitation more stringent than 0.5 mg/l which do not already have dechlorination equipment installed, are given up to a two year schedule in which to meet the limitation. All discharging facilities which are upgrading are required to meet a chlorine limitation as part of the upgrade, based on the same criteria noted above.

Ammonia

Ammonia in effluents poses a problem both as a source of toxicity to aquatic life and as an oxygen-demanding waste. New facilities and facilities proposed for upgrade are required to meet ammonia limits for toxicity if those limits are more stringent than instream dissolved oxygen based limits. Existing facilities are not be required to meet ammonia limits based on calculated toxicity unless instream toxicity has been identified through toxicity testing.

Metals/Priority Pollutants

Major municipal and industrial facilities are required to submit periodic priority pollutant scans to EPD as part of their permit monitoring requirements or upon submittal of a permit application for permit reissuance. The priority pollutant data is assessed in accordance with the Georgia Rules and Regulations for Water Quality Control. The results of the assessment can be used to trigger either additional priority pollutant monitoring, a toxicity reduction evaluation or permit limits for certain parameters.

Color

The State's narrative water quality standard for color requires that all waters shall be free from material related to discharges which produce color which interferes with legitimate water uses. EPD's color strategy will address this standard for industrial and municipal discharges by implementing permit limits and/or color removal requirements. EPD requires new facilities or discharges to prevent any noticeable color effect on the receiving stream. EPD requires existing facilities with color in their effluent to collect upstream and downstream color samples when their NPDES permit is reissued. The facility must conduct an assessment of the sources of color. Also, a color removal evaluation may be required at permit reissuance. EPD will also target facilities for color removal requirements based on significant citizen complaints of discoloration in streams.

Phosphorus

Almost all major municipal NPDES facilities between Buford Dam and West Point Lake, are required to meet a phosphorus limitation of 0.75 mg/l monthly average. All of the major facilities in this stretch of the river are meeting these limitations. The City of Atlanta water pollution control plants are required to meet a monthly average phosphorus limitation of 0.64 mg/l as a discharge average from their three plants in this stretch of the river starting February 1, 1997. Each of these facilities will have to individually meet the 0.64 mg/l limitation by January 1, 2001. Also, four facilities in this stretch of the river have design flows of less than 1.0 MGD and greater than or equal to 0.5 MGD. During late 1996 and 1997, each of these four facility's permits are coming up for reissuance. Each facility has been, or will be, required to meet the 0.75 mg/l monthly average phosphorus limitation within two years of the issuance date of each respective permit.

Temperature

Permits issued for facilities which discharge to primary trout streams are required to have no elevation of natural stream temperatures. Permits issued for facilities which discharge to secondary trout streams are required to not elevate the receiving stream more than 2 degrees Fahrenheit.

Stormwater Permitting

The 1987 Amendments to the federal Clean Water Act require permits to be issued for certain types of stormwater discharges, with primary focus on stormwater runoff from industrial operations and large urban areas. The USEPA promulgated Storm Water Regulations on November 16, 1990. EPD subsequently received delegation from the USEPA in January 1991 to issue General Permits and regulate storm water in Georgia. EPD has developed and implemented a stormwater strategy which assures compliance with the federal regulations.

The "Phase I" Federal Regulations set specific application submittal requirements for large (population 250,000 or more) and medium (population 100,000 to 250,000) municipal separate storm sewer systems. Accordingly, Georgia has issued individual area-wide NPDES municipal separate storm sewer system (MS4) permits to 58 cities and counties in municipal areas with populations greater than 100,000 persons. These permits authorize the municipalities to discharge storm water from the MS4s which they own or operate, and incorporate detailed storm water management programs. These programs may include such measures as structural and non-structural controls, best management practices, inspections, enforcement and public education efforts. Storm water management ordinances, erosion and sediment control ordinances, development regulations and other local regulations provide the necessary legal authority to implement the storm water management programs. Illicit discharge detection and long-term wet weather sampling plans are also included in the management programs. The permit requires the submission of Annual Reports to EPD, describing the implementation of the storm water management program.

EPD has determined that the metropolitan Atlanta area is a large municipal system as defined in the regulations. Clayton, Cobb, DeKalb, Fulton, and Gwinnett Counties and all interlying incorporated cities are required to comply with the application submittal target dates for a large municipal area. Forty-five stormwater permits were issued to the Atlanta area municipalities on June 15, 1994.

The City of Columbus and surrounding area has been identified as a medium municipal system as defined in the storm water regulations. A stormwater permit was issued on April 20, 1995.

The stormwater permits for large and medium municipal systems require annual reports to be submitted starting one year after the permit issuance. During 1995, the Georgia stormwater permitting program included EPD review of the first Annual Reports from each of the 45 Atlanta area municipalities. Among other things, the Annual Report includes a detailed description of the municipality's implementation of its Storm Water Management Plan.

The Atlanta Regional Commission (ARC) provides a variety of services related to stormwater management to the area cities and counties surrounding Atlanta. The ARC coordinated and facilitated the application process for the 45 NPDES municipal separate storm sewer system (MS4) permits which were issued by EPD to the Atlanta-area municipalities in 1994. The ARC provided (and continues to provide) a variety of services to area cities and counties, including rainfall analysis, land use characterization, mapping services and storm water management program guidance. In addition, the ARC organized and coordinated the storm water discharge characterization sampling and modeling efforts for the permit applications, and currently facilitates area storm water management through its activities with the Atlanta Region Storm Water Management Task Force, coordination of the Atlanta Regional Storm Water Sampling Program and publication of guidance documents. (Note: The ARC should be contacted directly regarding its involvement with land use planning, water quality monitoring, development of a water quality index and other work relevant to the basin planning process.)

EPD has issued one general permit regulating storm water discharges for 10 of 11 Federally regulated industrial subcategories defined in the Phase I Federal regulations. The eleventh subcategory, construction activities, will be covered under a separate general permit. The general permit for industrial activities requires the submission a Notice of Intent (NOI) for coverage under the general permit, the preparation and implementation of a storm water pollution prevention plan, and in some cases, the monitoring of storm water discharges from the facility. As with the municipal storm water permits, implementation of site-specific best management practices is the preferred method for controlling storm water runoff.

Currently there are 589 facilities in the Chattahoochee River Basin that have submitted NOIs for coverage under the general permit for storm water discharges associated with industrial activities. As with the municipal systems, implementation of Phase II of Federal storm water permitting is expected to result in a greater number of facilities becoming regulated to control storm water runoff. However, the specific types of industrial, commercial and retail activities which will be addressed under Phase II have yet to be determined.

7.1.3 Nonpoint Source Management

The strategies in this section address sources of environmental stressors which are not subject to NPDES permitting and typically originate from diffuse or nonpoint sources associated with land uses. Most strategies that address nonpoint source concerns are not regulatory in nature, but involve a variety of approaches such as technical assistance and education to prevent and reduce nonpoint source pollution in the basin. Strong stakeholder involvement will be essential to effectively implement many of these strategies.

Georgia Nonpoint Source Management Program

The Georgia Environmental Protection Division (EPD) is currently revising and updating the Georgia Nonpoint Source Management Program. The Georgia Nonpoint Source Management Program will provide an overview of the State's nonpoint source water quality management activities as well as a summary of what the State intends to accomplish in the next five federal fiscal years (FFY 1998 - FFY 2002). As outlined in the Clean Water Act, the State is only eligible to receive financial assistance under Section 319(h) for program implementation if the Georgia Nonpoint Source Management Program has been approved by the United States Environmental Protection Agency (USEPA).

EPD has contracted with the University of Georgia - Institute of Community Affairs and Development to assist in revising and updating the Georgia Nonpoint Source Management Program. A final draft of the Georgia Nonpoint Source Management Program will be submitted to the USEPA for review and approval in September, 1997.

During the initial phase, UGA - ICAD faculty will develop a composite inventory of nonpoint source pollution management activities at EPD and selected cooperating agencies. This inventory will be developed through a review of available documentation and series of site visits and interviews. An objective of this project is to compile information on both current nonpoint source pollution management activities and goals and activities anticipated over the next five years, FFY 1998 - FFY 2002, (including statewide and watershed-specific programs).

Once approved, the Georgia Nonpoint Source Management Program will address the following:

Agriculture	Subsurface mining
Non-irrigated crop production	Placer mining
Irrigated crop production	Dredge mining
Specialty crop production (e.g., truck farming and orchards)	Petroleum activities
Pasture land	Mill tailings
Range land	Mine tailings
Feedlots - all types	Land Disposal (Runoff/Leachate from Permitted Areas)
Aquaculture	Sludge
Animal holding/management areas	Wastewater
Silviculture	Landfills
Harvesting, reforestation, residue management	Industrial land treatment
Forest management	On-site wastewater systems (septic tanks, etc.)
Road construction/maintenance	Hazardous waste
Construction	Hydrologic/Habitat Modification
Highway/road/bridge	Channelization
Land development	Dredging
Urban Runoff	Dam construction
Storm sewers (source control)	Flow regulation/modification
Combined sewers (source control)	Bridge construction
Surface runoff	Removal of riparian vegetation
Resource Extraction/Exploration/Development	Streambank modification/destabilization
Surface mining	

Other	Spills
Atmospheric deposition	In-place contaminants
Waste storage/storage tank leaks	Natural
Highway maintenance and runoff	

Local governments will be provided a copy of the Georgia Nonpoint Source Management Program following USEPA approval.

Agricultural Nonpoint Source Control Strategies

Agricultural nonpoint source pollution continues to be managed and controlled with a statewide non-regulatory approach. This approach uses cooperative partnerships with various agencies and a variety of programs. A brief description of these agencies and outline of their functions and programs is provided below.

Georgia Soil and Water Conservation Commission (GSWCC). Created in 1937 by an Act of the Georgia Legislature, the GSWCC has been designated as the administering or lead agency for agricultural nonpoint source pollution prevention in the state. The GSWCC develops NPS water quality programs and conducts educational activities to promote conservation and protection of land and water resources devoted to agricultural uses. Primary functions of the GSWCC are to provide guidance and assistance to the Soil and Water Conservation Districts and provide oversight for the Georgia Erosion and Sedimentation Act. There are 6 regional offices and 40 local districts in the states. The initial contact for the GSWCC is F. Graham Liles, Jr., Executive Director, P.O. Box 8024, Athens, GA 30603, (706) 542-3065.

Soil and Water Conservation Districts (SWCDs). Georgia's SWCDs were also formed by Act of the Georgia General Assembly in 1937. Georgia's SWCD's receive no annual appropriations and are not regulatory or enforcement agencies. Their role is to provide leadership in the protection, conservation, and improvement of Georgia's soil, water, and related resources. This is accomplished through promotion efforts related to the voluntary adoption of agricultural best management practices (BMPs).

Currently, there are forty active SWCD's in Georgia, eleven of which are in the Chattahoochee River Basin. At the county level, each SWCD receives technical assistance, via an existing Memorandum of Agreement, from the United States Department of Agriculture's Natural Resources Conservation Service to work with landowners on implementing agricultural BMPs. Through these partnerships, applying a voluntary approach to conservation, 15 million acres have received conservation treatment in Georgia. The initial contact for the SWCDs is the same as for the GSWCC.

U. S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The NRCS (formerly known as the Soil Conservation Service or SCS) cooperates with federal, state, and local units of government to provide technical assistance to landowners, cooperators, producers, and special interest groups. Standards and specifications regarding conservation practices, animal waste management systems, grazing activities, plant materials, and other practices are developed and revised by a varied staff. The initial contact for the NRCS is United States Department of Agriculture, Natural Resources Conservation Service, Earl Cosby, State Conservationist, 355 Hancock Avenue, Athens, Georgia, (706) 546-2272.

University of Georgia's College of Agricultural and Environmental Sciences (CAES). The CAES includes various departments, the Cooperative Extension Service, and Experiment

Stations. Services provided include classroom instruction in agriculture-related topics; basic and applied research; consultative assistance; and information on nonpoint-related impacts on water quality; water quality monitoring; pest control; and analyses of nutrients, pesticides, herbicides, and other constituents in forage, water, and animal waste. Nutrient management plans for farms are often developed by CAES.

Farm Services Agency (FSA). The FSA, formerly known as the Consolidated Farm Services Agency (CFSA) and the Agricultural Stabilization and Conservation Service (ASCS), administers conservation cost-sharing and incentive programs for practices that improve environmental quality on farms. A variety of water quality improvement practices are cost-shared, with rates generally between 50 and 70 percent of the total cost of the installation. A large portion of funds allocated are targeted for high-priority watersheds with water quality problems. The initial contact for the FSA is Mr. Bobby Duncan, Acting State Director, Farm Services Agency, 355 East Hancock Avenue, Athens, GA 30601, (706) 546-2266.

Georgia Department of Agriculture (GDA). The GDA administers a variety of insect and plant and animal disease control programs. The Department also enforces myriad Georgia laws that include inspections of agricultural products and the registration and use of pesticides. The GDA also provides guidance in location of animal waste facilities and disposal of dead animals. The initial contact for the GDA is The Honorable Tommy Irvin, Commissioner, 204 Agriculture Building, Capitol Square, Atlanta, GA 30334, (404) 656-3600.

Agricultural Research Service (ARS). As part of the U. S. Department of Agriculture (USDA), the ARS is involved in a wide variety of agricultural research projects and monitoring programs. Research on grazing land systems and irrigation methods relevant to watershed-scale monitoring projects and nutrient movement in surface water and groundwater are examples of work performed by the ARS. The initial contact for the ARS is Dr. Jean Steiner, Director, 1430 Experiment Station Road, Watkinsville, GA 30677, (706)-769-8962.

Resource Conservation and Development (RC&D) Councils. RC&D councils are groups of local citizens that are involved in a program to encourage economic development, as well as the wise conservation of natural and human resources. The RC&D Councils are locally organized within geographic regions served by the USDA. The 1962 Food and Agriculture Act established the RC&D Council program with USDA employees called coordinators assigned to help the RC&D Councils. Currently, there are 10 RC&D Councils in Georgia. Initial contact for RC&D Councils is The Honorable Jeanette Jamieson, President, Georgia RC&D Council, P.O. Box 852, Toccoa, GA 30577 (706) 886-6889.

The federal and state agencies work closely with the Georgia agricultural commodity commissions and organizations such as the Farm Bureau Federation, AgriBusiness Council, Cattleman's Association, Milk Producers, Pork Producers Association, Poultry Federation, and other producer groups and agriculture support industries to control, prevent, and/or abate nonpoint source pollution.

The agricultural community has been participating with EPD in project activities designed to demonstrate agricultural best management practices (BMPs) through Section 319 of the Federal Clean Water Act. These demonstration projects act as a forerunner to Federal agricultural programs charged with getting conservation measures, or BMPs, installed within designated priority areas. The Cooperative Extension Service also works with landowners, through their Sustainable Agriculture & Farm-A-Syst Programs, to promote conservation measures, BMPs,

and other appropriate cultural practices designed to foster agricultural production using environmentally sound techniques.

Georgia's Soil and Water Conservation Districts, with assistance from the Natural Resources Conservation Service and the Farm Services Agency, work with landowners on the implementation of conservation measures and BMPs. The 1996 Farm Bill has enhanced and diversified the delivery of conservation programs in Georgia. It is anticipated that the Farm Bill delivery process will provide opportunities for all types of agricultural production to qualify for cost-share incentives to voluntarily implement BMPs, which will include, but not be limited to, conservation cropping sequence; conservation tillage practices; contour farming; grassed waterways; and terracing. A NRCS State Technical Committee, comprised of natural resource professional with diverse technical expertise and representing a number of State and Federal agencies, is now being utilized to identify priority resource concerns and geographic areas across the State. Conservation Programs available to address priority resource concerns include, but are not limited to: the existing Conservation Reserve Program (CRP), which protects highly erodible and environmentally sensitive land with grass, trees, and other long-term cover; the Wetland Reserve Program (WRP), a voluntary program designed to protect, restore, and enhance wetlands with cost-share incentives; and the Wildlife Habitat Incentives Program [WHIP], which will help landowners develop and improve habitats for upland wildlife, wetland wildlife, endangered species, fisheries, and other wildlife. Other programs include the Forestry Incentives Program (FIP), the Farmland Protection Program, and the newly created Environmental Quality Incentives Program (EQIP), which encompasses the old Agricultural Conservation Program and Water Quality Incentives Program, and is discussed further below. Collectively all of these programs will continue to have a significant and positive impact on Georgia's natural resources.

Environmental Quality Incentives Program

The 1996 Farm Bill created a new flagship conservation program, the Environmental Quality Incentives Program (EQIP), which will provide the lion's share of funding for technical, educational, and financial assistance for the implementation of agricultural best management practices. The NRCS has leadership for EQIP and works with the Farm Service Agency (FSA) to set policies, priorities, and guidelines. These two agencies take recommendations from local work groups and the State Technical Committee (discussed in the previous paragraph) when addressing actual, and potential, resource impairments associated with agricultural land uses.

EQIP provides incentive payments and cost-sharing for conservation practices through 5 - 10 year contracts. Producers may receive federal cost-sharing up to 75 percent of the average cost of certain conservation practices such as terraces, grassed waterways, filter strips, buffer strips, manure management facilities, animal waste utilization, and 46 other conservation practices important to improving and maintaining the health of natural resources in an area. An individual producer can receive as much a \$50,000 in EQIP funds to implement needed conservation practices.

A majority of funds allocated to Georgia (65 percent) will be spent in priority areas where there are serious and critical environmental needs and concerns. High priority is given to areas where state and local governments offer financial and technical assistance, and where agricultural improvements will help meet water quality and other environmental objectives. None of the priority areas are in the Chattahoochee River basin.

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The remaining 35 percent of funds allocated to Georgia can be extended outside priority areas to other parts of the state. Eligibility is limited to persons who are engaged in agricultural productions. Eligible land includes crop land, pasture land, forest land, and other farm lands.

Shown in Table 7-1 is the estimated Financial Assistance (FA), Educational Assistance (EA), and Technical Assistance (TA) that will be available to producers during the 1997 FFY in the Chattahoochee River basin. Local NRCS and FSA offices will have 3 - 5 years for obligating this year's allocation to eligible producers.

Forestry Nonpoint Source Control Strategies

In 1977, the Governor's Silviculture Task Force prepared a report which recommended a voluntary approach to the implementation of best management practices (BMPs) and the designation of the **Georgia Forestry Commission (GFC)** as the lead agency for implementing the Silviculture portion of the State Section 208 Water Quality Management Plan. The GFC was designated as the lead agency for silvicultural nonpoint source pollution prevention in the state in November, 1979. The Forestry Nonpoint Source Control Program is managed and

Table 7-1. Chattahoochee River Basin Agricultural BMPs-General Appropriations under EQIP for FFY 1997

	Resource Concerns (\$)			Totals (\$)
	Water Quality	Soil Erosion	Wildlife Habitats	
HUC 03130001				
Financial Assistance	32,005	11,741	-	43,746
Educational Assistance	140	106	-	246
Technical Assistance	6,401	2,348	-	8,749
<i>Total</i>	<i>38,546</i>	<i>14,196</i>	<i>-</i>	<i>52,742</i>
HUC 03130002				
Financial Assistance	18,106	17,993	-	36,099
Educational Assistance	79	163	-	242
Technical Assistance	3,621	3,598	-	7,220
<i>Total</i>	<i>21,806</i>	<i>21,754</i>	<i>-</i>	<i>43,560</i>
HUC 03130003				
Financial Assistance	11,992	8,698	16,703	37,392
Educational Assistance	53	79	199	330
Technical Assistance	2,398	1,740	3,347	7,485
<i>Total</i>	<i>14,443</i>	<i>10,516</i>	<i>20,249</i>	<i>45,208</i>
HUC 03130004				
Financial Assistance	7,881	11,564	6,223	25,668
Educational Assistance	35	105	74	213
Technical Assistance	1,576	2,313	1,238	5,127
<i>Total</i>	<i>9,492</i>	<i>13,981</i>	<i>7,535</i>	<i>31,008</i>
Grand Total				
Financial Assistance	69,983	49,996	22,926	142,905
Educational Assistance	307	452	273	1,032
Technical Assistance	13,997	9,999	4,585	28,581

implemented by the GFC, with the support of the forest industry, for the voluntary implementation of best management practices.

The Forestry Nonpoint Source Control Program is managed by a Statewide Coordinator and appointed foresters serving as District Coordinators from each of the twelve (12) GFC districts. The Statewide and District Coordinators conduct educational workshops, training programs and field demonstrations for the forest community (i.e., landowners, land management and procurement foresters, consulting foresters, timber buyers, loggers, site preparation contractors). The GFC investigates and mediates complaints involving forestry operations. In addition, the GFC conducts BMP compliance surveys to assess the effectiveness of BMP in the forest community. The GFC has established procedures for installing water control structures in firebreaks to reduce soil erosion and sedimentation.

In 1992, the GFC conducted a statewide BMP implementation survey by evaluating 342 sites. The most significant problems identified were with rate of implementation of BMPs on forest roads, skid trails, and stream crossings. Within the Chattahoochee River basin, the GFC evaluated 44 sites (1 mountain, 30 Piedmont and 13 Lower Coastal Plain). Thirty of the sites were on private lands, twelve forest industry lands and two public owned lands.

Approximately 42.2 miles of forest roads were evaluated on 40 sites of which 31.5 miles (75%) were in compliance with BMPs. Fifty eight percent of the sites maintained road grades in accordance with BMPs and water control structures (broad based dips, water bars, turnouts, etc.) were used on 44 percent of the sites. At critical areas such as stream crossings, roads were stabilized only on 31 percent of the sites with stream crossings.

Approximately 6,752 harvested acres were evaluated on 43 sites of which 6,345 acres (94%) were in compliance with the BMPs. On 24 sites that needed water bars installed in skid trails, only 3 sites (12%) actually installed them. Log decks in critical areas were retired and stabilized on 51 percent of the sites. Logging debris had been left in stream channels on 28 percent of the sites with streams. Random skidder crossings occurred on 33 percent of the sites with streams and temporary stream crossings consisting of debris and dirt were removed on 50 percent of the sites.

Approximately 2,017 site prepared acres were evaluated on three sites of which 2,007 acres (99%) were in compliance with BMPs. No problems were noted. Approximately 153 regenerated acres were evaluated on two sites of which 100 percent were in compliance with BMPs.

Since this survey, a massive BMP educational program was initiated and conducted. The GFC in cooperation with the Georgia Forestry Association (GFA) and the University of Georgia Cooperative Forest Extension Service has and is in the process of conducting professional forester, timber buyer and logger educational training. Member companies of the American Forest and Paper Association, as part of their Sustainable Forest Initiative, have funded an educational program called the Master Timber Harvesters Workshop with a goal of educating the 2,500 loggers in the state. The three day workshop which started in December 1995 focuses on forest ecology, silviculture, wildlife management, soils, hydrology, BMPs, harvest planning, insurance, OSHA regulations and business management. Already over 500 professional foresters and nearly 1,000 loggers have been trained. Because of this educational thrust, the

GFA has a goal of 100 percent BMP compliance by the year 2000. The GFC will be conducting BMP surveys in 1997 and 1999 to monitor this progress.

Recently, the State Board of Registration for Foresters adopted procedures to sanction or revoke the licenses of professional foresters involved in unresolved complaints where the lack of BMP implementation has resulted in state water quality or federal wetlands requirement violations.

Urban Nonpoint Source Control Strategies

The 1990 report of the Community Stream Management Task Force, *We All Live Downstream*, established a road map for urban nonpoint source management in Georgia. The Task Force was convened in 1988 to assist the Georgia Department of Natural Resources in developing a cooperative approach to prevention, control and abatement of nonpoint source impacts on urban streams. The Task Force's report emphasized the importance of cooperative partnerships and building working relationships between the units of government responsible for land and water quality management. Educational, management, and support strategies were recommended to help move toward an integrated structure which could provide continued evolution of intergovernmental and private sector roles and promote development of urban stream management activities over time.

The Task Force recognized two major impediments to effectively managing the quality of urban water bodies. The first is the division between 1) statutory responsibilities for management of water quality, granted to EPD, and 2) local government's Constitutional responsibility for management of the land activities which affect urban water bodies. The second impediment is the widespread nature of the nonpoint sources and the variety of activities which may contribute to impacts from urban runoff. They concluded that management of urban nonpoint source pollution would require ". . . a cooperative partnership between layers of government, the private sector, and the general public. The development of such a partnership will require a strong impetus to accept new institutional roles and make the structural changes necessary to support and sustain the stream management process."

Since publication of *We All Live Downstream*, urban nonpoint source management in Georgia has continued to evolve. Consistent with the multiple sources of urban runoff, the management systems has multiple focuses. Some programs focus on specific sources of urban runoff, targeting implementation of structural and/or management BMPs on individual sites or system wide. Other programs treat corridors along water bodies as a management unit to prevent or control the impacts of runoff on urban streams. Additional programs focus on comprehensive watershed management. This approach, which considers the impacts of all the land draining into a waterbody and incorporates integrated management techniques, is particularly critical to protecting or enhancing the quality of urban streams. The quality of urban waterbodies cannot be effectively managed without controlling the adverse impacts of activities in their watersheds.

While the state continues to have an important regulatory role, aspects of the cooperative intergovernmental partnerships envisioned by the Task Force have emerged and are being strengthened. EPD is implementing programs which go beyond traditional regulation, providing the regulated community with greater flexibility and responsibility for determining management practices. The agency is also expanding its role in facilitation and support of local management efforts. Development of this aspect of urban nonpoint source management will continue through the activities planned for the next five years.

EPD has a primary role in management of urban runoff, and is responsible for administering and enforcing a variety of permit programs, including permitting of stormwater discharges. In addition to these regulatory activities, EPD seeks to assist in development of local solutions to water quality problems; provides technical information on the water resources of the state; and administers grant programs, with funds from various sources to support non-point source planning and assessment, implementation of BMPs, and regional or local watershed management initiatives. EPD also conducts a variety of outreach and educational activities addressing urban runoff in general, regulatory requirements, and cooperative or non-regulatory approaches. Units within EPD which have responsibilities related to urban runoff are the surface Water Permitting Unit, housed in the Water Resources Management Branch, the Nonpoint Source Program, housed in the Water Protection Branch, and the Georgia Geologic Survey.

For urban runoff, activities of the Nonpoint Source Management Program interact strongly with point source controls for combined sewers and storm sewers, both of which discharge urban runoff through point conveyances. Current activities for urban surface runoff control include the following:

- Implement local nonpoint source (NPS) management programs, streambank and stream restoration activities, and community Adopt-A-Stream programs
- Develop and disseminate local watershed planning and management procedures
- Implement state and local Erosion and Sedimentation Control Programs
- Prepare and disseminate technical information on best management practices and nonpoint source monitoring and assessment.
- Implement NPS education programs for the general public, business and industry, local and regional governments, and school system
- Implement the Georgia Adopt-A-Stream Program, as described below in Section 7.1.6.
- Identify and evaluate resources to support urban watershed planning and management.

Local governments which have been granted the authority to issue land disturbing permits are encouraged to advertise and hold public educational workshops for those engaged in land disturbing activities (e.g., contractors, graders, etc.) in conjunction with GSWCC, EPD, and others. The purpose of these workshops would be to educate land disturbers regarding E&S law, proper installation and maintenance of erosion controls, BMPs, and fines and penalties for violators.

Since 1995, all newly certified local government E&S issuing authorities have been required to employ at least one qualified inspector who has passed the E&S short course taught by EPD and GSWCC. In addition, all existing local issuing authorities who have retained their issuing authority status following their proposed decertification by EPD, are similarly required to employ at least one qualified inspector who has passed the E&S short course taught by EPD and GSWCC. The number of qualified inspectors required for either new or existing local issuing authorities is determined by each local government based on the number of permits and sites within the jurisdiction of that local government.

Those local issuing authorities which have been audited, found to have erosion and sediment control program deficiencies, and notified of their proposed decertification by EPD, are required to submit monthly reports to EPD for up to six months in order to retain their issuing authority status. Each report specifies, at a minimum:

- (1) a listing with map locations of permitted land disturbing activities;
- (2) copies of inspection reports, notices of violation, citations, etc. issued;
- (3) copies of court proceedings;
- (4) corrective actions taken by cited violators; and
- (5) other relative actions pertaining to administration and enforcement of the local government's ordinance and implementation of its erosion and sedimentation control program.

Riparian buffers along state waters are necessary to help reduce the amount of nonpoint source pollution entering state waters from land disturbing activities. The Georgia Erosion and Sedimentation Act of 1975 as Amended (the Act), Chapter 12-7-6(b) provides for the protection of state waters by explicitly prohibiting certain land disturbing activities within 100-feet of trout waters and 25-feet from other specified state waters. The Act does give the EPD Director the authority to issue variances authorizing encroachment into the stream buffer, provided the project is at least as protective of the natural resources and the environment as before the variance was issued. If a variance is approved, the conditions that are stated in the variance must be incorporated into the approved Erosion and Sedimentation Control Plan and into the land disturbing permit. An issuing authority cannot issue a land disturbing permit where a variance is needed until the variance has been issued by the Director. The conditions of the variance are enforceable provisions of the land disturbing permit. EPD encourages cities and counties, when adopting or revising their local erosion and sedimentation control ordinance, to make their riparian buffer protection requirements more restrictive than what is specified in the Act.

To demonstrate nonpoint source control strategies and mechanisms available to local governments and landowners, EPD encourages the concept of local action teams at the sub-watershed level to address comprehensive watershed assessment and management to implement basin plan recommendations to meet water quality goals. The local action teams would be based on community partnerships to facilitate successful reduction of nonpoint source pollution. The local action teams would promote a cooperative approach to solving water quality problems by establishing a multi-disciplinary collaboration of local partners. The partners could include local governments, local industry and business, community groups, planning groups, local health departments, and any other interested local parties with a stake in the watershed. Funding for the local teams could be sought by the local partners. An example of this approach has been initiated in the Columbus area where a comprehensive watershed assessment is being sponsored by the Columbus Water Works.

EPD has provided both financial and technical support to and encouraged the development of local government water quality management programs. Projects have included support of local streamwatch programs in DeKalb, Fulton and Gwinnett Counties, and the Cities of Roswell and Alpharetta; support of the education and inspection program for streamside industries and businesses in the City of Gainesville; support of a pilot program to set up water-watch programs for neighborhood planning units in the City of Atlanta; support of stream assessment and the

development of a local stream management program in the Cities of Alpharetta and Roswell; and an annual Adopt-A-Stream Conference.

7.1.4 Floodplain Management

Floodplain Management Strategies

Floodplain Management in the State of Georgia is administered under federal regulations and local ordinances. The federal statutes are found in Title 44 of the Code of Federal Regulations Parts 59-79. As a condition of participation in the National Flood Insurance Program (NFIP), local political jurisdictions voluntarily adopt Flood Damage Prevention Ordinances, which are based on federal regulations, to enforce and administer floodplain development. Georgia's Floodplain Management Office has no regulatory authority.

Georgia's Floodplain Management Office, located within the Department of Natural Resources, Environmental Protection Division, serves as liaison between the Federal Emergency Management Agency (FEMA) and local governments participating in the NFIP. However, Georgia's Floodplain Management Office has no regulatory authority. Participation in the NFIP is a requirement for the Federal Government to make flood insurance available to all residents of the community. Through training workshops, quarterly newsletters, and technical assistance, the Floodplain Management Office assists local governments to maintain compliance with NFIP requirements. The Floodplain Management Office also provides technical data, floodplain maps, and training workshops to various public and private entities involved in floodplain management and floodplain determinations. In addition, the Floodplain Management Office reviews all state-funded and federally-funded projects for development in designated Special Flood Hazard Areas. A major thrust of the Floodplain Management Office is to increase local government participation in the NFIP beyond the 54% level achieved in 1996.

River Care 2000 Program

Georgia also has strategies to protect and manage riparian floodplain areas. Of particular relevance is River Care 2000, a conservation program which Governor Miller established in September 1995. One key objective of this program is acquisition of river-corridor lands for purposes of protection and to forestall unwise development in flood-prone areas. To date, River Care 2000 has obtained \$15.6 million in acquisition funds, and has begun negotiations to acquire suitable riparian lands via voluntary sales. The Coordinating Committee has approved procedures for three types of projects:

Riverway Demonstration Projects, which improve public access to a river with scenic and recreation uses, and protects natural and historic resources by acquiring and managing land in the river corridor;

Significant Sites, which are tracts of land which DNR will acquire and operate as a traditional state public-use facility: wildlife management or public fishing area, park or historic site, natural area, or greenway; and

Restoration Sites, which are tracts of land which the state will identify, acquire, and manage to reduce nonpoint-source water pollution.

7.1.5 Wetland Management Strategies

The loss of wetlands, because of the associated adverse impacts to flood control, water quality, aquatic wildlife habitat, rare and endangered species habitat, aesthetics, and recreational benefits, has become an issue of increasing concern to the general public as they become better informed of the values and functions of wetlands. We still suffer from the lack of accurate assessments for current and historic wetland acreage, but, regardless of the method used to measure total acreage or wetland losses, Georgia still retains the highest percentage of precolonial wetland acreage of any south-eastern state.

Efforts to Track No Net Loss of Wetlands

While the 1993 Federal Administration Wetlands Plan calls for a concerted effort by EPA and other federal agencies to work cooperatively toward achieving a no overall net loss of wetlands in the short term and a net increase in the quantity of the nation's wetlands in the long run, there have been no statutory or executive level directives to carry out this policy. Achievement of the goal of no net loss is dependent upon limited changes to regulations, memoranda of understanding, cooperative agreements, and other partnerships between federal, state, and local governments, conservation organizations, and private citizens.

All dredge and fill activities in freshwater wetlands are regulated in Georgia by the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act. The majority of wetland alterations occur under nationwide or general permits, which include permits for bridge building, minor road crossing fills, and fills of less than ten acres above the "headwaters" point of non-tidal streams where the annual average flow is less than 5 cubic feet per second. Enforcement is carried out by the COE and EPA in freshwater wetlands. Normal agricultural and silvicultural operations are exempted under Section 404 regulations.

The COE may require wetland mitigation activities in association were permitting, including creation, restoration, and protection of wetlands. COE may also require wetland restoration in case of violations. In the settlement of violations, restorations occurred on 16.8 acres in 1994, and 17.8 acres in 1995.

Land Acquisition

The Department of Natural Resources (DNR), Wildlife Resources Division (WRD), began a land acquisition program in 1987 to acquire 60,000 acres of additional lands for Wildlife Management Areas (WMAs) and Public Fishing Areas (PFAs). This initiative was funded by \$30 million of 20-year obligation bonds to be paid off by hunting and fishing license increases and WMA permit fees.

Beginning in 1990 Governor Zell Miller initiated Preservation 2000, a \$60 million program to acquire 100,000 acres of lands to be used for wildlife and fisheries management, parks and recreation, natural area preservation, and general conservation. Through December, 1995, 100,000 acres had been acquired by purchase, gift, or long term lease under this program. Additional wetlands acquisition occurs as part of the River Care 2000 initiative, discussed above.

Education And Public Outreach

WRD has one full-time person involved in aquatic education, providing training for educators in wetland values and acting as a resource person for developing and coordinating teaching materials. The Aquatic Education Program consists of three key components: Youth Education,

Adult Education, and Kids Fishing. Youth Education involves training educators to use Aquatic Project Wild (APW), which consists of instructional workshops and supplementary conservation curriculum materials for teachers of K-12 grade children. About 1,000 educators are trained annually to use APW in the classroom. Adult Education consists primarily of producing educational materials such as the annual Freshwater and Saltwater Sport Fishing Regulations, Reservoir and Southeast Rivers Fishing Predictions, Small Georgia Lakes Open to Public Fishing, Introduction to Trout Fishing, news releases, brochures, radio Public Service Announcements, videos, and staff presentations to sportsmen and civic organizations, as well as large events. The purpose of Kids Fishing Events (KFE) is to introduce youth and their families to the joys of recreational fishing.

The aquatic education program touches tens of thousands of youths and adults each year, bringing these people closer to the environment, and teaching them conservation principles that are important to sustaining healthy fish populations, such as clean lakes and streams, and maintaining functional wetlands.

State Protected Species in Wetlands

With assistance from the US Fish and Wildlife Service, Section 6 Federal Aid Program, and USDA-Forest Service Stewardship Program, WRD has developed and published a descriptive handbook of Georgia's 103 protected plant species that includes endangered, threatened, unusual, and rare plant species found in the state. Forty percent of the protected species are dependent on wetland or aquatic habitats in the vast majority of known occurrences. The "Protected Plants of Georgia" book includes illustrations, descriptions, threats to species or their habitats, range in adjoining states, historical notes, and recommendations for management of protected species habitats.

The protected plant book has been distributed to all DNR personnel and wildlife biologists involved in the management of state properties. The protected plant book is being distributed to Georgia Forestry Commission (200), USDA-Natural Resource Conservation Service (300), Forest Service, US F&WS, Corps of Engineers, US EPA, major utility companies, forest products corporations, consulting biologists, educators, and private citizens. The book will call the public's attention to the need to protect wetlands on private property as well as public property in the state.

7.1.6 Stakeholder Involvement/Stewardship Strategies

Stakeholder involvement and stewardship are essential to address one of the major challenges identified by the Community Stream Management Task Force in *We All Live Downstream*: nonpoint sources of pollution are diffuse and varied, therefore prevention, control and abatement of nonpoint source impacts will require action by a wide range of audiences. Effective nonpoint source management must address the numerous activities of individuals, businesses, industries, and governments which can adversely affect urban and rural waters. In many cases, these groups are unaware of the potential impacts of their activities or corrective actions which may be taken. Consequently, community and citizen educational strategies were emphasized in the Task Force's recommendations.

Georgia has chosen a two-pronged approach to encourage stewardship via education and citizen monitoring. EPD is the lead agency in these education and citizen monitoring programs, but like other aspects, of the state's nonpoint source management effort, cooperative efforts with local governments and community-based groups are critical to their implementation. Outreach

and education, including citizen monitoring, lays the groundwork for behavior change and is often an important pre-requisite for effective implementation of BMPs and comprehensive watershed management programs. The first component of the state's education and citizen monitoring program is development of Georgia Adopt-A-Stream, designed to promote citizen monitoring and waterbody protection. The second prong of the state's effort is general education. A report outlining a plan for nonpoint source education in Georgia was completed in 1994. Titled Georgia Urban Waterbody Education Plan and Program, the plan laid out nonpoint education strategies for seven target audiences: general public, environmental interest organizations, civic associations, educators, business associations, local government officials, and state government officials. Given limited resources and the scope of effort required to target each of these audiences concurrently, EPD decided to initially target nonpoint source education efforts toward educators and students in grades K-12. When programs for that audience have been fully implemented, the focus of nonpoint source education in the state will be re-evaluated and additional target audience(s) identified to encourage active involvement in controlling nonpoint source pollution. EPD nonpoint source program staff will be available, time-permitting, to assist the local advisory committees in outreach efforts.

General goals for stakeholder involvement and stewardship strategies are:

- Generate local support for nonpoint source management through public involvement and monitoring of streams and other water bodies and of results of management actions.
- Increase individual's awareness of how they contribute to nonpoint source pollution problems and implement appropriate strategies to motivate behavior change and actions to address those problems.
- Provide the educational tools, assistance, and support for addressing NPS problems to target audiences across the state.

Georgia Adopt-A-Stream

The Georgia Adopt-A-Stream Program is a citizen monitoring and stream protection program. Currently, more than 5,000 volunteers participate in individual and community sponsored Adopt-A-Stream Programs. Volunteers conduct clean-ups, stabilize streambanks, monitor streams using biological and chemical methods, and evaluate habitats and watersheds. These activities lead to a greater awareness of water quality and nonpoint source pollution, active cooperation between the public and local governments in protecting water resources, and the collection of basic water quality data. The Georgia Adopt-A-Stream Program focuses on what individuals and communities can do to protect Georgia's water resources from nonpoint source pollution. The Program offers training and support in the following activities – watershed surveys, visual surveys, biological monitoring, chemical testing and clean ups.

In 1989 the DNR appointed a Community Stream Management Task Force (CSMTF) to seek a cooperative intergovernmental approach to integrate land and water quality management to correct, abate, and prevent stream contamination. A final report containing the task force's findings and recommendations was released during the second quarter of 1991. EPD utilized the task force's recommendations regarding the development of resources and initiating programs for local and regional governments including participation by the general public. EPD developed and presented a local government stream management and assessment workshop. A task force was assembled and a report prepared to guide the development of a Adopt-

A-Stream Program for Georgia. EPD has made numerous presentations to encourage the formation of local Adopt-A-Stream organizations, assembled and distributed a package of materials for interested groups, provided technical assistance, and provided grant support to programs operated by local governments. In 1993, EPD hired full-time coordinators for the statewide Adopt-A-Stream and Nonpoint Source Education Programs.

The Georgia Adopt-A-Stream Program addresses nonpoint source pollution from agriculture, silviculture, construction and urban runoff. The focus of the Adopt-A-Stream Programs in middle and southern Georgia is often agricultural NPS pollution (especially, where land use is largely agricultural crop production). Examples of agricultural NPS pollution are presented in workshops, videos and manuals (e.g., excess fertilizer and animal waste). In north Georgia, the focus is generally silvicultural NPS pollution (especially, in areas adjacent to the Chattahoochee and Oconee National Forests). Adopt-A-Stream Programs in urban areas address construction and urban runoff NPS pollution. Workshops and training sessions emphasize the connection between land use, stormwater runoff and water resources. Erosion and sedimentation control at construction sites is always a major concern with volunteers. Therefore, Georgia's Erosion and Sedimentation Act is explained and the issuing authority for land disturbing activity permits is identified.

Volunteers are offered three (3) levels of involvement. Each level involves an education and action component on a local stream. Volunteers commit for a minimum of one (1) year on a half-mile stream segment. Level I consists of setting up a project (i.e., identifying a stream segment, identifying partners, registering with the Georgia Adopt-A-Stream Program), evaluating land use and stream conditions during a "watershed walk", conducting quarterly visual evaluations and clean-ups, and one public outreach activity. Volunteers create a "Who to Call for Questions or Problems" list so that if something unusual is noted, immediate professional attention can be obtained. Level II builds on Level I by adding either biological monitoring, chemical monitoring or a habitat improvement project. Level III includes two or more Level II activities.

Approximately 500 volunteers participate in the various workshops each year. An "Introduction to Adopt-A-Stream Program" and "Watershed Walk" videos have been produced, duplicated and distributed on loan. The Georgia Adopt-A-Stream Program Manuals have been printed and distributed to approximately 1,000 volunteers. In addition, a bi-monthly newsletter is published and distributed to over 1,000 volunteers. The Annual Georgia Adopt-A-Stream Conference and Awards Ceremony is held each fall. The Georgia Adopt-A-Stream Program assists EPD in organizing the Annual Georgia River Clean-Up Week each fall, with over 1000 volunteers cleaning up river segments in over 50 locations. In addition, the Georgia Adopt-A-Stream Program conducts numerous presentations around the State.

The Georgia Adopt-A-Stream Program is a statewide program with two (2) staff positions in EPD and five (5) Regional Training Centers. The Regional Training Centers are a network of college-based training centers located in Albany, Columbus, Dahlonega, Milledgeville and Savannah. This network of training centers allows the Georgia Adopt-A-Stream Program to be accessible to all areas of the state.

Several organizations have already established Adopt-A-Stream Programs in the Chattahoochee Basin, including City of Alpharetta, Clayton County, Gainesville-Hall County, Gwinnett

County, and City of Roswell. Appendix F provides a list of Georgia Adopt-A-Stream volunteer groups in the Chattahoochee River Basin.

With funding from the Captain Planet Foundation, U. S. Environmental Protection Agency and the Turner Foundation, the Upper Chattahoochee Riverkeeper has augmented the Georgia Adopt-A-Stream Program with a focused environmental education effort to create a minimum of six new Adopt-A-Stream Programs each year throughout the Chattahoochee River Watershed and to connect the forty existing programs and new groups in the watershed.

The Chattahoochee River Adopt-A-Stream Network brings the program to a wider audience throughout the fifteen counties in the Upper Chattahoochee River Basin. Currently, 75% of the existing Adopt-A-Stream Programs are located in metropolitan Atlanta. Outlying communities and rural agricultural areas have fewer resources and opportunities to initiate water quality monitoring programs. The Upper Chattahoochee Riverkeeper will target these outlying areas, as well as certain threatened streams in Atlanta, which do not have Adopt-A-Stream Programs in place.

With the Program's outreach activities, nonpoint source pollution sources and preventive measures are described. As with any public outreach program, the prevention, control and/or abatement of nonpoint source pollution must be measured indirectly. As outlined, the active participation of volunteers and local and regional governments in the Georgia Adopt-A-Stream Program indirectly point towards significant pollution prevention.

Nonpoint Source Education: Project WET

As described above, EPD is currently targeting initial nonpoint education activities toward educators and students in grades K-12. To reach this target audience, EPD has focused on implementing Project WET, a water resources education curriculum which focuses on nonpoint pollution. Covering impacts on groundwater and on surface water, the curriculum addresses the following nonpoint sources: agriculture, forestry, urban, and construction. It is recognized nationally and internationally and is readily adaptable to fit the State's Quality Core Curriculum requirements. To date, nonpoint source concerns have not received significant emphasis in water resources education efforts in Georgia. Implementation of Project WET will address this gap, providing educators and students in grades K-12 with an understanding of the problems caused by nonpoint source pollution and of the tools that can be used to prevent, control or abate nonpoint source impacts. EPD began implementing Project WET in December 1996. Initial facilitator training sessions were conducted in January and February 1997.

Resources for teachers which are currently available include a curriculum module on groundwater flow, the Enviroscape teaching module, and the River of Words Teacher's Guide. Resources which are under development include an Educator Newsletter, a Web page for students, the Georgia River Resource Guide, the Georgia Liquid History Well, Georgia River Trunks (a traveling puppet show) and Hydora (a NPS education performance character). In addition to these resources, an awards program is planned to recognize outstanding efforts on behalf of Project WET and nonpoint source education in Georgia. EPD will be the lead agency of Project WET for a minimum of three years. Initially, implementation will target selected population centers with existing environmental education activities to help leverage the limited resources of EPD's NPS Education Program. It is expect that full implementation of Project WET will take three years. EPD will serve as the lead agency for period with the following acting as cooperating agencies: Georgia Environmental Education Alliance, State PTA, National Park

Service, Southface Energy Institute, and Zoo Atlanta. After three years, it is expected that a cooperating agency will assume responsibility for on-going Project WET activities. At that time, the focus of the state's NPS education activities will be re-evaluated and, depending on the focus of education efforts undertaken by other entities, another of the audiences identified in the 1994 education plan may be targeted.

7.1.7 Ground Water Protection Strategies

In 1984, EPD developed its first management plan to guide the management and protection of Georgia's ground water quantity and quality. The current version, Georgia Geologic Survey Circular 11, published in 1996, is the basis of Georgia's application to be certified by U.S. EPA for a Comprehensive State Ground Water Protection Plan (CSGWPP). The goal of Georgia's ground water management plan is:

. . . to protect human health and environmental health by preventing and mitigating significant ground water pollution. To do this, Georgia will assess, protect, and, where practical, enhance the quality of ground waters to levels necessary for current and projected future uses for public health and significant ecological systems.

The goal recognizes that not all ground water is of the same value. The Division's goal is primarily preventive, rather than curative; but it recognizes that nearly all ground water in the state is usable for drinking water purposes and should remain so. EPD pursues this goal through a policy of anti-degradation by which ground water resources are prevented from deteriorating significantly, preserving them for present and future generations. Selection of this goal means that aquifers are protected to varying degrees according to their value and vulnerability, as well as their existing quality, current use, and potential for future use.

EPD has adequate legal authority to prevent ground water from being significantly polluted and to clean-up ground water in the unlikely event pollution were to occur. Extensive monitoring has shown that incidents of ground water pollution or contamination are uncommon in Georgia; no part of the population is known to be at risk.

In general, the prevention of ground water pollution includes—(1) the proper siting, construction, and operation of environmental facilities and activities through a permitting system; (2) implementation of environmental planning criteria by incorporation in land-use planning by local government; (3) implementation of a Wellhead Protection Program for municipal drinking water wells; (4) detection and mitigation of existing problems; (5) development of other protective standards, as appropriate, where permits are not required; and (6) education of the public to the consequences of ground water contamination and the need for ground water protection.

Ground water pollution is prevented in Georgia through various regulatory programs (administered by the State's Department of Natural Resources) which regulate the proper siting, construction, and operation of the following:

- public water supply wells, large irrigation wells and industrial wells withdrawing more than 100,000 gallons per day,
- injection wells of all types,

- oil and gas wells (including oil and gas production),
- solid waste handling facilities,
- hazardous waste treatment/storage/disposal facilities,
- municipal and industrial land treatment facilities for waste and wastewater sludge,
- municipal and industrial discharges to rivers and streams,
- storage/concentration/burial of radioactive wastes, and
- underground storage tanks.

EPD prevents the contamination of ground water used for municipal drinking water through an EPA-approved Wellhead Protection Program. As a result of this program, certain new potentially polluting facilities or operations are restricted from wellhead protection areas, or are subject to higher standards of operation and/or construction. EPD also encourages local governments to adhere to the Criteria for the Protection of Groundwater Recharge Areas (a section of the Rules for Environmental Planning Criteria), which define higher standards for facility siting, operation, and clean-up in significant ground water recharge areas. The most stringent guidelines of these criteria pertain to those recharge areas with above average ground water pollution susceptibility indexes.

Additionally, EPD has legal authority under the Georgia Water Quality Control Act to clean up ground water pollution incidents. Additional clean up authority occurs as special trust funds established to clean up leaking underground storage tanks, abandoned hazardous waste sites, and scrap tire dumps.

Most laws providing for protection and management of ground water are administered by EPD. Laws regulating pesticides are administered by the Department of Agriculture, environmental planning by the Department of Community Affairs; and on-site sewage disposal, by the Department of Human Resources. EPD has established formal Memoranda of Understanding (MOU) with these agencies. The Georgia Groundwater Protection Coordinating Committee was established in 1992 to coordinate groundwater management activities between the various departments of state government and the several branches of EPD.

7.2 Targeted Management Strategies

This section describes specific management strategies that are targeted toward the concerns and priority issues for the Chattahoochee River basin described in Section 6. Strategies are presented by geographic area. For each of the identified concerns, the management strategy statement consists of five components: a problem statement (identical to that given in Section 6), general goals, ongoing efforts, identified gaps and needs, and strategies for action. The purpose of these statements is to provide a starting point for key participants in the sub-basin to work together and implement strategies to address each priority concern. In some cases, a strategy may simply consist of increased monitoring; in other situations, the stakeholders in the sub-basin will need to develop innovative solutions to these water quality issues. While EPD will continue to provide technical oversight, conduct monitoring surveys, and evaluate data, locally-led efforts in the sub-basins will be required to help to restore and maintain the water quality throughout the Chattahoochee River basin.

For many issues, similar strategies, with minor variations, are appropriate for several different geographic areas. In addition, similar targeted strategies may be used to address a variety of priority concerns if these concerns are linked to the same source of stress. For example, successfully controlling urban runoff can reduce loadings of metals, fecal coliform bacteria, and sediments entering a water body.

7.2.1 Hydrologic Unit 03130001, Area A (Headwaters to Lake Lanier) and Lake Lanier

Hydrologic Unit 03130001 is discussed in two parts (Areas A and B). Area A includes the Chattahoochee River watershed upstream of Buford Dam, with land use ranging from the urban area of Gainesville to forest covered mountains with trout streams. The valuable resource of Lake Lanier is also included. Water quality in this area is generally good.

The concerns identified for portions of this subbasin include metals concentrations, fecal coliform bacteria, erosion and sedimentation, nutrients, and water quantity.

Issue A: Metals

Problem Statement: The water use classification of fishing was not fully supporting in two Chattahoochee River mainstem segments, in 4 tributary stream segments, and in two areas of Lake Lanier due to exceedences of the water quality standards for metals. Lead, copper, and/or zinc standards were exceeded in the river due to a water pollution control plant discharge in one segment and to nonpoint sources in the second segment; zinc, copper, lead and/or mercury standards were exceeded in tributary streams due primarily to nonpoint sources in three segments and to a water pollution control plant in one segment; and nonpoint sources of lead and mercury were exceeded once each in a different portions of Lake Lanier.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: The primary contributor of metals to streams are nonpoint sources. In cases where a water pollution control plant was the likely cause of the elevated metals concentration, EPD has taken enforcement action through the NPDES permitting process to require compliance with NPDES permit limits for metals.

The Lake Lanier Water Quality Cooperative River Basin Study is ongoing to identify existing and potential source impacts to Lake Lanier from the Upper Chattahoochee and Chestatee Rivers. This project is sponsored by the Upper Chattahoochee River Soil and Water Conservation District, Hall County Soil and Water Conservation Districts and the Chestatee-Chattahoochee RC&D Council. Sediment and agricultural chemical and nutrient loadings will be used to assess nonpoint source pollution from agricultural, forested and other rural sources. A GIS data base will be developed that delineates potential areas of nonpoint source pollution to be used by the Georgia Soil and Water Conservation Districts to prioritize technical and financial assistance.

The EPD is conducting a Clean Lakes Phase I Diagnostic-Feasibility Study of Lake Lanier. The study is being done by contract with the University of Georgia and the Tennessee Valley Authority. The study will provide information on sources of metals in the watershed. Initial results of this work suggest that mercury in the watershed may be coming from atmospheric

deposition, urban runoff, and/or from past gold mining operations in the Dahlonega Gold Belt, including the Chestatee and Yahoola Creek drainages (Leigh and Gamble, 1997).

Identified Gaps and Needs: EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action: Addressing metals from nonpoint sources will be a complex task. An initial task will be to conduct additional monitoring to document if water quality standards are actually being exceeded.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters; continue to enforce point source compliance with metal limits through the NPDES permitting program; and conduct additional monitoring to document metals concentrations in segments affected by nonpoint sources of metals.
- Other participants: to be identified contingent on further analysis to confirm metal concentrations and on identification of potential sources.

Specific Management Objectives: Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: EPD will take the lead in conducting additional monitoring to confirm if water quality standards are being exceeded. If violations are documented, EPD will develop a plan to assess sources and identify alternative solutions.

Action Plan:

- UGA and TVA will complete and report on the Clean Lakes Phase I Diagnostic-Feasibility Study work in 1998.
- The Upper Chattahoochee River Soil and Water Conservation District, Hall County Soil and Water Conservation Districts and the Chestatee-Chattahoochee RC&D Council will complete and report on their study of the Lake Lanier watershed.

- EPD will complete a review of existing metals data in listed segments by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: To be proposed as strategies are refined.

Issue B: Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing or recreation was not fully supported in three Chattahoochee River mainstem segments and 30 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, rural nonpoint sources and/or animal wastes. This area has a high concentration of poultry operations, and spreading of poultry waste on fields may be a potential source.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: One water pollution control plant was cited as a potential source of fecal coliform bacteria and is under Order to achieve compliance with permit limits. The principal sources of exceedances of water quality standards for fecal coliform bacteria are urban runoff and rural nonpoint sources.

Recently, several water quality demonstration projects have been developed with Clean Water Act Section 319(h) funds to address agricultural nonpoint source pollution management in this basin. Between 1989 and 1994, the Chestatee-Chattahoochee RC&D Council evaluated practices for handling animal manure in the White Creek and Mossy Creek watersheds. These watersheds contain 25 million head of poultry, 18,000 hogs, and 5,000 cattle. The project demonstrated advantages of composting over traditional manure applications of poultry waste, including reduced potential for coliform loading to streams. In addition, the project demonstrated to dairy farmers that installing heavy use area BMPs would reduce surface runoff and groundwater contamination.

Also with Section 319(h) funds, GSWCC demonstrated a "total resource management" system on a dairy farm in Hall County. This demonstration project serves as a model for other producers to develop an integrated set of BMPs to control, prevent, and/or abate nonpoint source pollution associated with dairy operations.

The EPD is conducting a Clean Lakes Phase I Diagnostic-Feasibility Study of Lake Lanier. The study is being done by contract with the University of Georgia and the Tennessee Valley Authority. The study will provide information on sources of fecal coliform bacteria in the watershed.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal bacterial loads may be attributable to natural sources (e.g.,

wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows may be a source of fecal coliforms. In addition, previous sampling was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle may be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Strategies for Action: Separate strategies are needed to address nonpoint fecal coliform bacteria loading for urban and agricultural sources.

Urban Areas

Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles:

- EPD: monitor and assess use support in listed stream segments and encourage local efforts to address nonpoint source pollution.
- Local governments: operate and maintain sewer systems and wastewater treatment plants, monitor land application systems, develop stormwater programs, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local health departments: continue to identify and correct poorly operating septic systems and educate owners about the proper maintenance of septic tank systems.

Specific Management Objectives: Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level.

Action Plan:

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will continue to administer the stormwater program.

- EPD will encourage local governments to develop urban stormwater management strategies which may include construction of abatement structures such as plunge pools, flow spreaders, check dams, retention basins, compost, stormwater treatment systems, and sand filters.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December, 2000, in accordance with the statewide RBMP management cycle.

Method for Tracking Performance: EPD tracks point source discharges through inspections and evaluations of self-monitoring data. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Rural Areas

Key Participants and Roles:

- EPD: monitor and assess use support in listed streams, encourage local planning efforts, regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of agricultural management practices.
- County and municipal governments: septic system regulation, and land use planning guidelines.

Specific Management Objectives: Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan:

- EPD will continue to ensure that permitted point sources remain in compliance with fecal coliform bacteria limits.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill are still being worked out, but it is expected that incentives will be targeted to areas of apparent water quality impact, including rural streams which may sustain excessive fecal coliform loads from animal operations.

- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality.

Method for Tracking Performance: Agricultural agencies will track rates of BMP implementation for animal operations. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue C: Erosion and Sedimentation

Problem Statement: 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. There are no stream segments listed at this time in this subbasin as not fully supporting designated water uses due to poor fish communities or sedimentation.

General Goals: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Ongoing Efforts: The Lake Lanier Water Quality Cooperative River Basin Study is ongoing to identify existing and potential source impacts to Lake Lanier from the Upper Chattahoochee and Chestatee Rivers. This project is sponsored by the Upper Chattahoochee River Soil and Water Conservation District, Hall County Soil and Water Conservation Districts and the Chestatee-Chattahoochee RC&D Council. Sediment and agricultural chemical and nutrient loadings will be used to assess nonpoint source pollution from agricultural, forested and other rural sources. A GIS data base will be developed that delineates potential areas of nonpoint source pollution to be used by the Georgia Soil and Water Conservation Districts to prioritize technical and financial assistance.

The 1992 Georgia Forestry Commission (GFC) compliance survey examined 10 sites in HUC 03130001 and found 85% of harvested forest acres and 84% of forest road miles in compliance with BMPs. GFC is targeting education to increase compliance with forestry BMPs.

GSWCC has recently updated, and has made available for distribution, the Manual for Erosion and Sedimentation Control in Georgia, which will be distributed to personnel working on erosion and sedimentation issues throughout the state.

The EPD is conducting a Clean Lakes Phase I Diagnostic-Feasibility Study of Lake Lanier. The study is being done by contract with the University of Georgia and the Tennessee Valley Authority. The study will provide information on the issue of erosion and sedimentation in the watershed. Initial results of the Clean Lakes study include recommendations on control of erosion and sedimentation including adoption of NRCS recommendations for BMPs for crop land and pasture, sediment management on forest property, improvement of unpaved county roads to reduce sediment loads, and erosion and sediment control on new construction sites (Hatcher, 1994).

Identified Gaps and Needs: Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through

biological monitoring. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBMPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. The WRD is working with the IBI (Integrated Biotic Index) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

Unpaved rural roads are thought to be a significant contributor to sedimentation but the amount of loading is unclear. Further monitoring may be needed to quantify the impact of rural roads as a source of sedimentation into streams.

A key need for developing strategies to address erosion, sedimentation, and habitat issues in urban streams is definition of appropriate management goals. It is likely that streams with highly urbanized watersheds cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD and other stakeholders.

Strategies for Action: Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles:

- EPD: encourage local government water quality improvement efforts; and continue the development of biomonitoring methods.
- Local governments: where the issuing authority enforce erosion controls for construction practices, land use planning.
- GSSWC and local S&WCDs and RC&D Councils with assistance from NRCS: encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC: continue to monitor and encourage implementation of forestry BMPs.
- USFS: lead agency for management of forest lands within the Chattahoochee National Forest.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Management Option Evaluation: During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan:

- GSSWC and local S&WCDs and RD&D Councils with assistance from NRCS will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will target landowner and user groups for BMP education to encourage compliance with forestry BMP guidelines.

- USFS to continue BMP implementation, stream assessments, and water quality management in the Chattahoochee National Forest.
- Local governments where the issuing authority will enforce erosion controls for construction practices.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic life.

Method for Tracking Performance: GSWCC and GFC will track BMP implementation.

Issue D: Nutrients

Problem Statement: The water use classifications of fishing, drinking water, and recreation are potentially threatened in Lake Lanier due to inputs of nutrients which may cause excess algal growth in the lake. Nutrient sources include water pollution control plant discharges and nonpoint sources from urban and agricultural areas.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: An initial Phase I Clean Lakes report for Lake Lanier was issued in 1994 (Hatcher, 1994). This provides draft nutrient budgets for the lake, but also documented the need for further study, which is ongoing.

The Lake Lanier Water Quality Cooperative River Basin Study is ongoing to identify existing and potential source impacts to Lake Lanier from the Upper Chattahoochee and Chestatee Rivers. This project is sponsored by the Upper Chattahoochee River Soil and Water Conservation District, Hall County Soil and Water Conservation Districts and the Chestatee-Chattahoochee RC&D Council. Sediment and agricultural chemical and nutrient loadings will be used to assess nonpoint source pollution from agricultural, forested and other rural sources. A GIS data base will be developed that delineates potential areas of nonpoint source pollution to be used by the Georgia Soil and Water Conservation Districts to prioritize technical and financial assistance.

Counties and municipal governments with utilities and jurisdictions in the Chattahoochee River Basin above Buford Dam have formed an Upper Chattahoochee Basin Group (URBG). The mission of the Group is to develop information and tools to promote the protection of water quality and efficient use of water resources within the basin. One project initiated by the Group is the development of a water quality model for Lake Lanier for use in evaluating impacts of various alternative proposals for water supply and treated wastewater discharges.

As part of ongoing work to assess nonpoint sources in the Lake Lanier watershed, EPD has contracted with the Tennessee Valley Authority (TVA) to obtain 1996 color infrared aerial photography of a portion of the watershed and produce interpretations, maps, and summaries of potential nonpoint sources of pollutant loads. This geographic database will provide an important tool for managing nutrient loading as well as loading of other pollutants. This work is a part of the ongoing Clean Lakes Phase I Diagnostic-Feasibility Study of Lake Lanier.

Several water quality demonstration projects have been developed with Section 319(h) funds to address agricultural nonpoint source management of nutrients in this basin. Between 1989 and 1994, the Chestatee-Chattahoochee RC&D Council evaluated practices for handling animal manure in the White Creek and Mossy Creek watersheds. These watersheds contain 25 million head of poultry, 18,000 hogs, and 5,000 head of cattle. The project demonstrated advantages of composting over traditional manure applications to fields for poultry waste. In addition, the project demonstrated to dairy farmers that installing heavy use BMPs would reduce surface runoff and groundwater contamination, while stream corridor management would stabilize stream banks.

GSWCC also demonstrated a “total resource management system” on a dairy farm in Hall Co. in the upper Chattahoochee River basin. This demonstration project serves as a model for other producers to develop an integrated set of BMPs to control, protect, and/or abate nonpoint source pollution associated with dairy operations.

Identified Gaps and Needs: The initial Phase I Clean Lakes report (Hatcher, 1994) documented the need for substantial further study to develop and evaluate an effective management plan for nutrients in the Lake Lanier drainage. This work is ongoing as a part of the Clean Lakes Phase I Diagnostic-Feasibility and as a part of the Lake Lanier Water Quality Cooperative River Basin Study.

Strategies for Action: Protection of Lake Lanier will require basinwide strategies to control nutrient loads. Initial efforts will focus on continued BMP implementation for source control. A more focused plan is expected to emerge from completion of the Lake Lanier Cooperative River Basin Study and the Clean Lakes Phase I Diagnostic-Feasibility Study.

Key Participants and Roles:

- EPD: monitor and assess use support in area waters as a part of the river basin monitoring process; encourage voluntary nonpoint source control strategies; regulate wastewater treatment plants and other point sources of nutrient load; propose nutrient standards for Lake Lanier following completion of the Clean Lakes Diagnostic-Feasibility and Lake Lanier Cooperative River Basin Studies.
- GSWCC and local S&WCDs and RC&D Councils with assistance from NRCS: promote implementation of agricultural management practices to reduce erosion and nutrient export.
- The Lake Lanier Water Quality Cooperative River Basin Study, sponsored by the Upper Chattahoochee River S&WCD, the Hall Co. S&WCD, and the Chestatee-Chattahoochee RC&D Council: basin management strategies and provide a forum for local stakeholder participation in the strategy.
- Georgia Forestry Commission: encourage implementation of forestry BMPs.
- County and municipal governments, with support from Georgia Mountains RDC: regulate septic systems, where the issuing authority enforce of erosion controls for construction, and land use planning.

Specific Management Objectives: Develop water quality standards for nutrients for Lake Lanier following completion of studies.

Management Option Evaluation: A formal evaluation of management options will take place as part of the Lake Lanier Water Quality Cooperative River Basin Study.

Action Plan:

- Complete the Clean Lakes Phase I Diagnostic-Feasibility, URBG modeling, and the Lake Lanier Water Quality Cooperative River Basin Studies, including recommendations for management options.
- Following completion of the studies, EPD will propose nutrient standards for Lake Lanier.
- Nonpoint loading of phosphorus is largely associated with the movement of sediment. Therefore, all the actions for nonpoint sediment and erosion control to be undertaken by agricultural and forestry organizations and local governments and described under Issue C are relevant to nutrient loading.

Method for Tracking Performance: The nutrient management effort for Lake Lanier is designed to protect existing good water quality. Standards will be proposed following completion of the ongoing studies and following adoption of standards monitoring will be done to assess compliance with standards.

Issue E: Water Quantity

Problem Statement: Sufficient surface water quantity to meet the competing demands for drinking water, and other environmental releases, hydropower, recreation, and (downstream) navigation uses may not be available within Lake Lanier and the upstream basin.

General Goals: Provide adequate downstream water releases to meet Georgia's priority needs while maintaining pool levels in Lake Lanier which provide for recreation opportunities and hydropower production, yet anticipate potential future water shortages.

Ongoing Efforts: Water quantity needs and allocations throughout the entire basin are being addressed through the ACT/ACF Study. Projections of future water needs indicate that not all demands can be met under historic conditions of water shortage. Georgia will not agree to an allocation which falls significantly short of its expected needs, though there may be less than optimal quantities of water for some uses during drought conditions.

Identified Gaps and Needs: The models and data bases which have been under development since 1991 must be completed and approved prior to development of an allocation formula.

Strategies for Action: Water quantity issues will be managed in the context of the ACT/ACF allocation process.

Key Participants and Roles:

- Interstate Commission for the ACF Basin is responsible for developing water allocation formula.
- States of Georgia, Alabama, Florida are parties to the ACT/ACF allocation process.

- U.S. Army Corps of Engineers has the primary operational control of flow of water within the basin.

Specific Management Objectives: Maintain pool levels in Lake Lanier which provide for recreation opportunities and hydropower production, yet anticipate potential future water shortages, within the allocation targets developed in the ACT/ACF allocation process.

Management Option Evaluation: During the remainder of 1997 and 1998, the states of Alabama, Florida, and Georgia, together with the Corps of Engineers, will complete the ACT/ACF data base and model development effort and will analyze alternative options for management of the water resources in the Flint and Chattahoochee basins.

Action Plan:

- The Interstate Commission for the ACF Basin will be responsible for developing a water allocation formula by the end of 1998. This formula will include methods for managing the reservoirs, such as Lanier, to meet the needs of the citizens of Georgia. If an allocation agreement is not successfully reached, the issue will likely be decided in a court of law.

Method for Tracking Performance: To be determined.

7.2.2 Hydrologic Unit 03130001, Area B (Buford Dam to Peachtree Creek near Atlanta)

This area of the Chattahoochee River basin runs from the outflow of Lake Lanier to the growing metropolitan Atlanta area. The mainstem of the Chattahoochee supports a unique cold water trout fishery, well south of the normal range for trout, due to releases of cold bottom water from Lake Lanier. The Chattahoochee River National Recreation Area is also located on this segment of the Chattahoochee River. The DeKalb County, Cobb County and Atlanta water intakes, as well as a number of metropolitan Atlanta water pollution control plant discharges are located on this segment of the Chattahoochee River.

The concerns identified for portions of this subbasin include metals concentrations, fecal coliform bacteria, water temperature, dissolved oxygen, erosion and sedimentation, instream flows, and concentrations of PCBs, chlordane and/or mercury in fish tissue.

Issue A: Metals

Problem Statement: The water use classification of fishing was not fully supported in one segment of the Chattahoochee River and in 11 tributary stream segments due to exceedances of water quality standards for metals primarily in the Atlanta metropolitan area. Lead, copper, and zinc standards were exceeded in the river primarily due to urban runoff and zinc, copper, cadmium, and/or lead standards were exceeded in tributary streams also due primarily to urban runoff.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. The EPD issued an areawide stormwater permit on 6/15/94 covering

45 municipalities. This strategy will encourage a number of protective measures, as described in Section 7.1.

The Atlanta Regional Commission (ARC) is coordinating stormwater management for local governments in the Atlanta metro area. ARC has established the Regional Stormwater Management Task Force as a forum for cooperative management of stormwater in the metro area, and coordinates stormwater monitoring required for annual reports to EPD. The ARC also expects to develop a water quality management plan for the Atlanta metropolitan region. The plan's purpose is to provide a means for coordinating regional water quality issues and needs with local governments, state and federal agencies, and the public. The final plan will include a GIS-based inventory of water resources and facilities, identification of water quality problems and pollutant sources, and recommendations regarding regional solutions. The plan will serve as a tool to provide technical and general information to the public, elected officials and government staff and to prioritize activities, resources, and funding for prevention or mitigation of water quality impacts.

Finally, ARC addresses urban BMPs through the development review process established by the Georgia Planning Act. As the designated regional planning agency in metropolitan Atlanta, ARC reviews and comments on developments that may have significant regional impacts. In this review process, ARC estimates annual storm water pollutant loads generated from proposed project sites and provides interim guidelines for best management practices for developers and jurisdictions to follow if these projects are approved. It is expected that, when the regional plan is complete, projections from that plan will be used to refine loading estimates and guidelines regarding BMPs. The review process provides an opportunity to promote awareness of BMPs for storm water control, educate elected officials on the need for vigorous erosion and sedimentation controls and storm water management programs, and to encourage improved water quality monitoring in the region.

The City of Atlanta has recently initiated an Urban Watershed Management Program. This program involves two separate watershed studies. The second addresses areas that discharge to the Chattahoochee basin, including Peachtree, Nancy, Proctor, Utoy, and Sandy Creeks. These studies will result in Watershed Water Quality Management Plans that will create a framework for addressing nonpoint source pollution in the watersheds. The first phase will establish goals for water quality improvement and recommend alternatives for meeting the goals. Subsequent phases of the program will include detailed planning and design of water quality enhancements, which may range from stream restoration projects and educational programs to additional pollution control facilities.

Identified Gaps and Needs: The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional

biological monitoring may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action: Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters; administer stormwater regulations; encourage local efforts to address nonpoint sources of pollution.
- ARC: coordinate stormwater management for the Atlanta metro area.
- Local governments: stormwater management strategies, where issuing authority erosion and sedimentation control enforcement, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Encourage local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level using forums such as the Regional Stormwater Task Force.

Action Plan:

- EPD will complete a review of existing metals data in this area by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- EPD will continue to administer the stormwater regulations and will encourage local planning to address stormwater management.
- Local governments under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FY 1999. EPD will review these applications during FY 1999.
- EPD will continue to develop Rapid Bioassessment Protocol capabilities designed to assess impairment of aquatic life.
- EPD will encourage involvement of citizen groups through the Adopt-A-Stream program to address restoration of urban streams.

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for metals. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- ARC will develop a draft water quality management plan for the Atlanta metro area in FY 1999.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue B: Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in four Chattahoochee River segments and in 30 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, combined sewer overflows, septic systems, sanitary sewer overflows, and rural nonpoint sources.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Water pollution control plant discharges in this area have generally been compliance with permit limits for fecal coliform bacteria. Combined sewer overflows have historically been a cause of standards violations in the tributary streams to which they discharge. Control strategies for the combined sewer overflows are under construction, as described in Section 4.1.1.2 and should control bacteria concentrations.

The principal source of exceedances of water quality standards for fecal coliform bacteria is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows may also contribute to the problem.

Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/9 covering 45 municipalities. This will encourage a number of protective measures, as described in Section 7.1.

The Atlanta Regional Commission (ARC) is coordinating stormwater management for local governments in the Atlanta metro area. ARC has established the Regional Stormwater Management Task Force as a forum for cooperative management of stormwater in the area, and coordinates stormwater monitoring required for annual reports to EPD. The ARC also expects to develop a water quality management plan for the Atlanta metropolitan region. The plan's

purpose is to provide a means for coordinating regional water quality issues and needs with local governments, state and federal agencies, and the public. The final plan will include a GIS-based inventory of water resources and facilities, identification of water quality problems and pollutant sources, and recommendations regarding regional solutions. The plan will serve as a tool to provide technical and general information to the public, elected officials and government staff and to prioritize activities, resources, and funding for prevention or mitigation of water quality impacts.

Finally, ARC addresses urban best management practices (BMPs) through the development review process established by the Georgia Planning Act. As the designated regional planning agency in metro Atlanta, ARC reviews and comments on developments that may have significant regional impacts. In this review process, ARC estimates annual stormwater pollutant loads generated from proposed project sites and provides interim guidelines for BMPs for developers and jurisdictions to follow if these projects are approved. It is expected that, when the regional plan is complete, projections from that plan will be used to refine loading estimates and guidelines regarding BMPs. The review process provides an opportunity to promote awareness of BMPs for stormwater control, educate elected officials on the need for vigorous erosion and sedimentation controls and stormwater management programs, and to encourage improved water quality monitoring in the region.

The City of Atlanta has recently initiated an Urban Watershed Management Program. This program involves two separate watershed studies. The second addresses areas that discharge to the Chattahoochee basin, including Peachtree, Nancy, Proctor, Utoy, and Sandy Creeks. These studies will result in Watershed Water Quality Management Plans that will create a framework for addressing nonpoint source pollution in the watersheds. The first phase will establish goals for water quality improvement and recommend alternatives for meeting the goals. Subsequent phases of the program will include detailed planning and design of water quality enhancements, which may range from stream restoration projects and educational programs to additional pollution control facilities.

Big Creek is one of the streams in this area listed as partially supporting designated uses with excursions of the fecal coliform bacteria standard. Big Creek is a major tributary to the Chattahoochee River and flows through north Fulton and Forsyth counties, as well as the cities of Alpharetta, Cumming, and Roswell, with a drainage area of 98 mi². Recently, the Big Creek Watershed Protection Study was launched to develop a comprehensive approach to address deterioration in stream condition due the effects of urbanization and development. Currently in the preliminary phase, this study will provide a vehicle for local governments in the watershed, assisted by the Atlanta Regional Commission and Georgia Mountains RDC, to work cooperatively to understand the impacts of urbanization on the creek and develop a plan to protect the resource by integrating various elements of watershed protection: local government policies, development guidelines, wetland protection, greenways development, structural facility siting and design, etc. If successful, this effort may serve as a template for initiatives to address urban nonpoint impacts on other streams.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal coliform bacteria may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform bacteria sources. Sanitary sewer leaks and overflows may be a source of fecal coliform bacteria. In addition, previous sampling

was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle will be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Strategies for Action: Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles:

- EPD: monitor and assess use support in listed stream segments; administer CSO control efforts, administer stormwater regulations; regulate point sources under the NPDES program; and encourage local government efforts to address nonpoint source pollution.
- ARC: coordinate stormwater management to the Atlanta metro area.
- Local governments: operate and maintain sewer systems and wastewater treatment plants, stormwater programs, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local health departments: continue to identify and correct poorly operating septic systems and educate owners about the proper care and maintenance of septic systems.

Specific Management Objectives: Encourage local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level using forums such as the Regional Stormwater Task Force.

Action Plan:

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will continue to administer the stormwater regulations and CSO control efforts.
- ARC will develop a draft water quality management plan for the Atlanta metro area in FFY 1999.

- Local governments under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FY 1999. EPD will review these applications during FY 1999.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December, 2000, in accordance with the statewide RBMP management cycle.

Methods for Tracking Performance: EPD tracks point source discharges through inspections and evaluations of self-monitoring data. Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue C: Water Temperature

Problem Statement: The segment of the Chattahoochee from Buford Dam to Peachtree Creek is designated as a secondary trout water. The cold temperature is largely governed by patterns of release from Buford Dam. The water use classification of fishing is potentially threatened in this segment due to urban runoff from impervious areas, loss of riparian tree canopy, and water pollution control plant discharges. There are no waters currently listed for excursion of temperature standards in this segment of the river.

General Goals: Meet water quality standards to support water uses.

Ongoing Efforts: Temperature in this reach of the Chattahoochee is controlled by a combination of hydropower operations at Buford Dam, point source discharges, urban runoff, and climate. To fully address these issues, greater understanding of the system is required. Accordingly, EPD initiated a major modeling project, the Chattahoochee River Modeling Project (CRMP), in 1992, designed to provide a general-purpose, time-variable modeling system to represent flow, temperature, dissolved oxygen and nutrients in the mainstem of the Chattahoochee River from Buford Dam to Franklin, Georgia. At this time, all basic model components are in place and preliminary calibration has been achieved (Burke et al., 1997). When calibration is completed, the CRMP will provide an effective tool for evaluating issues related to temperature, dissolved oxygen, and nutrients in this reach of the Chattahoochee. At the request of EPD, the Wildlife Resources Division recently recommended temperature criteria for protecting the tailwater trout fishery from point and nonpoint source impacts.

One way in which warming is mitigated is through the preservation of riparian shade cover. Georgia's Metropolitan River Protection Act contains special provisions for protection of major water supply rivers in metropolitan areas with more than 1,000,000 people. The Act's purposes

include water quality protection, control of erosion, and prevention of activities that contribute to flooding. In the Atlanta region, the Act established a river protection corridor within 2,000 feet of both banks of the Chattahoochee River and its impoundments from Buford Dam to Peachtree Creek, and directed ARC to develop a Corridor Plan to protect the land and water resources of the Chattahoochee River Corridor. Criteria contained in the adopted plan include the following: 1) limits on the amount of clearing and impervious surface within the Corridor, based on the vulnerability of the land to development; 2) a 50-foot natural undisturbed vegetative buffer, a 150-foot building setback along the riverbank, and a 35-foot natural undisturbed vegetative buffer along tributaries in the corridor; and 3) controls on river floodplain development.

Identified Gaps and Needs: Effects of land use changes and future development will need to be factored into the development of a long term plan.

Strategies for Action: Managing temperature in the Chattahoochee River requires a detailed understanding of physical processes. This context is being supplied by the ongoing EPD CRMP effort.

Key Participants and Roles:

- EPD: monitor and assess use support in the river; administer stormwater regulations; regulate point sources under the NPDES program; and develop the CRMP model.
- U.S. Army Corps of Engineers: owns and operates Buford Dam.
- ARC: Chattahoochee River Corridor Plan and coordinate stormwater management for the Atlanta metro area.
- Local governments: implement stormwater management strategies and continue operations of water pollution control plants.
- WRD: study habitat requirements of fish populations.

Specific Management Objectives: Meet water quality standards to support designated uses.

Management Option Evaluation: Once calibrated, the CRMP model will provide EPD with the capability to examine tradeoffs among different sources of thermal load. This will help to reach cost-effective solutions designed to maintain the desired temperature regime.

Action Plan:

- EPD will complete calibration of the CRMP model. EPD will use the CRMP model to examine the interaction between dam operations, point source discharges and stormwater inputs. EPD will review alternatives in the next basin planning cycle for maintenance of compliance with the temperature standard.
- EPD will request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits involving significant thermal loading. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth.

Approved watershed management steps will be included as a condition of new or expanded permits.

- Metropolitan Atlanta local governments under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FFY 1998-1999. EPD will review these applications during FFY 1999 and will evaluate whether an assessment of thermal loading in stormwater discharges should be made.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Method for Tracking Performance: Monitoring of water temperature at strategic locations along the mainstem of the river.

Issue D: Dissolved Oxygen

Problem Statement: The fishing water use classification was not fully supported in one segment of the Chattahoochee River and in one tributary segment due to dissolved oxygen concentrations less than standards. Low dissolved oxygen in the river segment was due to bottom water discharges from Buford Dam, and in the tributary, Clear Creek, was due to nonpoint sources and combined sewer overflows.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Dissolved oxygen in the mainstem of the Chattahoochee River is controlled by a combination of hydropower operations at Buford Dam, point source discharges, urban runoff, and climate. There is also a strong interaction between temperature and dissolved oxygen, as colder water has a higher saturation concentration and thus holds more oxygen. To fully address these issues, greater understanding of the system was required. Accordingly, EPD initiated a major modeling project, the Chattahoochee River Modeling Project (CRMP), in 1992, designed to provide a general-purpose, time-variable modeling system to represent flow, temperature, dissolved oxygen and nutrients in the mainstem of the Chattahoochee River from Buford Dam to Franklin, Georgia. At this time, all basic model components are in place and preliminary calibration has been achieved. When calibration is completed, the CRMP will provide an effective tool for evaluating issues related to temperature, dissolved oxygen, and nutrients in this reach of the Chattahoochee.

Water quality impairment in Clear Creek is being addressed through construction of the Clear Creek CSO treatment facility.

Identified Gaps and Needs: Dissolved oxygen dynamics within this reach represent the net interaction of many sources of oxygen-demanding loads and complex in-river dynamics. The CRMP model provides a tool for evaluating these interactions. Preliminary applications to date confirm the importance of low oxygen levels in Buford dam releases as a contributor to low dissolved oxygen levels in the mainstem of this reach.

Strategies for Action: The EPD will reevaluate dissolved oxygen conditions in Clear Creek following completion of treatment facilities. The Corps of Engineers will work on the

assessment and implementation of feasible actions to maintain acceptable dissolved oxygen concentrations in waters released from the dam.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters, administer stormwater regulations, and regulate point sources under the NPDES program.
- The Corps of Engineers: owns and operates the dam.
- ARC: coordination of the Atlanta metro stormwater management.

Specific Management Objectives: Meet water quality standards to support designated water uses.

Management Option Evaluation: The CRMP model will provide EPD with the capability to examine tradeoffs among different components of the dissolved oxygen mass balance. This will help to reach cost-effective solutions designed to maintain the desired dissolved oxygen regime. The Corps of Engineers will evaluate alternatives for improving dissolved oxygen concentrations in releases from Buford Dam.

Action Plan:

- EPD will complete calibration of the CRMP model. EPD will use the CRMP model to examine the interaction between dam operations, point source discharges and stormwater inputs.
- EPD will evaluate and assess use support in listed waters and will work with the Corps to evaluate cost-effective changes in dam operation to improve dissolved oxygen concentrations in releases from Buford Dam.
- The Corps of Engineers will evaluate alternatives to improve dissolved oxygen concentrations in releases from Buford Dam.
- ARC will coordinate stormwater management for the Atlanta metro area.
- Local governments will implement stormwater management strategies and manage operations of water pollution control plants.
- WRD will continue work to study habitat requirements of fish populations.

Methods for Tracking Performance: Monitoring of dissolved oxygen concentrations downstream of the Buford Dam. A reevaluation of the dissolved oxygen issues will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue E: Erosion and Sedimentation

Problem Statement: The water use classification of fishing is potentially threatened in many segments by erosion and loading of sediment, which can alter stream morphology, impact habitat, reduce water clarity, and clog drinking water systems. Currently, there is one stream

segment listed in this subbasin as partially supporting designated uses due to poor fish community. Sediment may be a factor influencing the fish community in these segments. Potential sources include urban runoff and development (particularly construction), unpaved rural roads, forestry practices, and agriculture.

General Goals: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Ongoing Efforts: The Metropolitan River Protection Act (MRPA) provides for the protection of a corridor within 2000 feet of the Chattahoochee River between Buford Dam and Peachtree Creek. The MRPA also requires the preparation of local codes and ordinances pertaining to land vulnerability standards, buffer zones adjacent to the Chattahoochee River and tributaries, and floodplain standards. New development must be reviewed by the ARC for compliance with the MRPA and approved by the local governments. Participating local governments include the Cities of Atlanta, Berkeley Lake, Duluth, Roswell, Sugar Hill and Suwanee, and Cobb, Forsyth, Fulton, and Gwinnett Counties. Criteria contained in the adopted plan include the following: 1) limits on the amount of clearing and impervious surface within the Corridor, based on the vulnerability of the land to development; 2) a 50-foot natural undisturbed vegetative buffer, a 150-foot building setback along the riverbank, and a 35-foot natural undisturbed vegetative buffer along tributaries in the corridor; and 3) controls on river floodplain development.

Identified Gaps and Needs: Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring. The stream segment currently listed as partially supporting was based on fish IBI (Index of Biotic Integrity) studies conducted by the WRD in this area of the state. EPD is also developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. These tools provide methods for detecting and quantifying impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

Rural roads are thought to be a contributor to sedimentation but the amount is unclear. Further monitoring may be needed to quantify the impact of rural roads as a source of sedimentation into streams.

A key need for developing strategies to address erosion, sedimentation, and habitat issues in urban streams is definition of appropriate management goals. It is likely that streams with highly urbanized watersheds cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD and other stakeholders.

Strategies for Action: Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles:

- EPD and WRD: monitor and assess use support in listed waters; encourage water quality improvement efforts; and continue the development of biomonitoring methods.

- ARC: urban best management practices, the stormwater strategy and provisions of MRPA.
- Local governments: where the issuing authority enforce erosion controls for construction practices and land use planning.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Management Option Evaluation: During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan:

- EPD and WRD will continue to develop RBMP capabilities designed to assess aquatic life impairment.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- ARC will implement urban best management practices and the stormwater strategy and develop a draft regional water quality management plan for the Atlanta metropolitan area in 1999.
- Local governments delegated the authority for E&S will enforce controls for construction practices.
- The basin team will re-evaluate listed stream status and management strategies during the next basin cycle, scheduled for 2001.

Method for Tracking Performance: During this iteration of the basin cycle, management will focus on source control BMPs. Local governments will track compliance with erosion control measures.

Issue F: Instream Flows

Problem Statement: The water use classifications of fishing and recreation are potentially threatened by inadequate instream flows in the Chattahoochee River mainstem.

General Goals: Maintain adequate flows to support designated water uses. Supply sufficient flows to meet waste assimilation demands in the Atlanta metropolitan area.

Ongoing Efforts: A minimum flow guideline of 750 cfs in the Chattahoochee River at Peachtree Creek is currently in effect to meet waste assimilation demands. This flow target does not, however, necessarily meet fishing and recreational use requirements.

Water quantity needs and allocations throughout the entire basin are being addressed as part of the ACT/ACF study. EPD's Chattahoochee River Modeling Project will provide a general-

purpose, time-variable modeling system to represent flow, temperature, dissolved oxygen and nutrients in the mainstem of the Chattahoochee River from Buford Dam to Franklin, Georgia. This model can be used to evaluate the interaction of flow and waste assimilation demands.

Identified Gaps and Needs: A current state requirement for minimum flows is to maintain the 7Q10 flow (7-day average low flow with a once in ten years recurrence interval), when water is available upstream. Consideration is being given to an increase in this minimum flow requirement based on recommendations of WRD (Evans and England, 1995).

Strategies for Action: Mainstem flows are primarily determined by releases from Lake Lanier, which is managed by the Corps of Engineers. Corps management of water resources throughout the basin is subject to a 1990 lawsuit by Alabama against the Corps and a 1992 Memorandum of Agreement between the Corps and the governors of Alabama, Florida, and Georgia. Overall constraints on management of water quantity within the upper basin will likely be determined by the outcome of the ACT/ACF study. EPD and WRD will work with the Corps to determine appropriate instream flow regulation for this section of the Chattahoochee.

Issue G: Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in the Chattahoochee River mainstem from Buford Dam to Morgan Falls Dam and from Morgan Falls Dam to Peachtree Creek. PCBs, mercury, or chlordane were the cause of consumption guidelines in the upper segment of the river and PCBs caused the guidelines in the lower segment of the river. The guidelines are for rainbow trout, carp, largemouth bass, and yellow perch in the upper segment and for carp in the lower segment.

General Goals: Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts: DNR has monitored fish in river and the lake and issued fish consumption guidelines. There are no known point source discharges of PCBs or chlordane in the watershed. It is now illegal to manufacture PCBs: however, in the past, these synthetic oils were used regularly as fluids for electrical transformers, cutting oils, and carbonless paper. Although they were banned in 1976, they do not break down easily and remain in sediment for years. Chlordane is a man-made pesticide which was used in the 1940s to the early 1980s as an agricultural pesticide. In 1978 chlordane was restricted to termite control use only. All uses of chlordane were banned in the United States in the 1980s. Chlordane is persistent in the environment and may remain in sediment for many years. Mercury is a naturally occurring metal that recycles between land, water, and air. As mercury cycles through the environment, it is absorbed and ingested by plants and animals. Most of mercury absorbed will be returned to the environment but some will remain in the plant and animal tissues. It is not known where the mercury in fish originated. Mercury may be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the mercury is related to global atmospheric transport.

Identified Gaps and Needs: There are no known sources of PCBs or chlordane within the watershed. Mercury in the area is likely derived from natural sources or from atmospheric deposition.

Strategies for Action: Because the loads of PCBs, chlordane, mercury are not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants Roles:

- EPD and WRD: sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives: EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan:

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2000 in accordance with the river basin monitoring cycle.

7.2.3 Hydrologic Unit 03130002, Area A (Peachtree Creek to West Point Lake) and West Point Lake

This area begins in the densely populated Atlanta metropolitan area and extends to West Point Lake on the Alabama border. The bulk of the Atlanta metropolitan area treated wastewater discharges occur in the upstream end of this HUC. To the south and east of Atlanta, landuse includes significant amounts of silviculture and some agriculture. The most significant water quality problems remaining to be addressed in this area are those associated with urban runoff.

The concerns identified for portions of this subbasin include metals concentrations, fecal coliform bacteria, nutrients, erosion and sedimentation, water temperature and concentrations of PCBs and chlordane in fish.

Issue A: Metals

Problem Statement: The water use classification of fishing was not fully supported in three segments of the Chattahoochee River and in 15 tributary stream segments due to exceedances of water quality standards for metals primarily in the Atlanta metropolitan area. Lead or copper standards were exceeded in the river primarily due to urban runoff and zinc, copper, cadmium, lead and/or mercury standards were exceeded in tributary streams also due primarily to urban runoff.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. The EPD issued an areawide stormwater permit on 6/15/94 covering 45 municipalities. This strategy will encourage a number of protective measures, as described in Section 7.1.

The Atlanta Regional Commission (ARC) is coordinating stormwater management for local governments in the Atlanta metro area. ARC has established the Regional Stormwater Management Task Force as a forum for cooperative management of stormwater in the metro area, and coordinates stormwater monitoring required for annual reports to EPD. The ARC also expects to develop a water quality management plan for the Atlanta metropolitan region. The plan's purpose is to provide a means for coordinating regional water quality issues and needs with local governments, state and federal agencies, and the public. The final plan will include a GIS-based inventory of water resources and facilities, identification of water quality problems and pollutant sources, and recommendations regarding regional solutions. The plan will serve as a tool to provide technical and general information to the public, elected officials and government staff and to prioritize activities, resources, and funding for prevention or mitigation of water quality impacts.

Finally, ARC addresses urban BMPs through the development review process established by the Georgia Planning Act. As the designated regional planning agency in metropolitan Atlanta, ARC reviews and comments on developments that may have significant regional impacts. In this review process, ARC estimates annual storm water pollutant loads generated from proposed project sites and provides interim guidelines for best management practices for developers and jurisdictions to follow if these projects are approved. It is expected that, when the regional plan is complete, projections from that plan will be used to refine loading estimates and guidelines regarding BMPs. The review process provides an opportunity to promote awareness of BMPs for storm water control, educate elected officials on the need for vigorous erosion and sedimentation controls and storm water management programs, and to encourage improved water quality monitoring in the region.

The City of Atlanta has recently initiated an Urban Watershed Management Program. This program involves two separate watershed studies. The second addresses areas that discharge to the Chattahoochee basin, including Peachtree, Nancy, Proctor, Utoy, and Sandy Creeks. These studies will result in Watershed Water Quality Management Plans that will create a framework for addressing nonpoint source pollution in the watersheds. The first phase will establish goals for water quality improvement and recommend alternatives for meeting the goals. Subsequent phases of the program will include detailed planning and design of water quality enhancements, which may range from stream restoration projects and educational programs to additional pollution control facilities.

Identified Gaps and Needs: The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be

given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action: Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters; administer stormwater regulations; encourage local efforts to address nonpoint sources of pollution.
- ARC: stormwater management for the Atlanta metro area.
- Local governments: stormwater management strategies, where the issuing authority erosion and sedimentation control enforcement, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Encourage local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level using forums such as the Regional Stormwater Task Force.

Action Plan:

- EPD will complete a review of existing metals data in this area by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- EPD will continue to administer the stormwater regulations and will encourage local planning to address stormwater management.
- Local governments under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FY 1999. EPD will review these applications during FY 1999.
- EPD will continue to develop Rapid Bioassessment Protocol capabilities designed to assess impairment of aquatic life.
- EPD will encourage involvement of citizen groups through the Adopt-A-Stream program to address restoration of urban streams.
- EPD will continue to ensure that permitted point sources remain in compliance with permitted effluent limitations for metals. EPD will also request a comprehensive

watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.

- ARC will develop a draft water quality management plan for the Atlanta metro area in FY 1999.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue B: Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in three Chattahoochee River segments and in 45 tributary stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combination of urban runoff, combined sewer overflows, septic systems, sanitary sewer overflows, and rural nonpoint sources.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Water pollution control plant discharges in this area have generally been in compliance with permit limits for fecal coliform bacteria. Combined sewer overflows have historically been a cause of standards violations in the tributary streams to which they discharge. Control strategies for the combined sewer overflows are under construction, as described in Section 4.1.1.2 and should control bacteria concentrations.

The principal source of exceedances of water quality standards for fecal coliform bacteria is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows may also contribute to the problem.

Urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/9 covering 45 municipalities. This will encourage a number of protective measures, as described in Section 7.1.

The Atlanta Regional Commission (ARC) is coordinating stormwater management for local governments in the Atlanta metro area. ARC has established the Regional Stormwater Management Task Force as a forum for cooperative management of stormwater in the area, and coordinates stormwater monitoring required for annual reports to EPD. The ARC also expects to develop a water quality management plan for the Atlanta metropolitan region. The plan's purpose is to provide a means for coordinating regional water quality issues and needs with local governments, state and federal agencies, and the public. The final plan will include a

GIS-based inventory of water resources and facilities, identification of water quality problems and pollutant sources, and recommendations regarding regional solutions. The plan will serve as a tool to provide technical and general information to the public, elected officials and government staff and to prioritize activities, resources, and funding for prevention or mitigation of water quality impacts.

Finally, ARC addresses urban best management practices (BMPs) through the development review process established by the Georgia Planning Act. As the designated regional planning agency in metro Atlanta, ARC reviews and comments on developments that may have significant regional impacts. In this review process, ARC estimates annual stormwater pollutant loads generated from proposed project sites and provides interim guidelines for BMPs for developers and jurisdictions to follow if these projects are approved. It is expected that, when the regional plan is complete, projections from that plan will be used to refine loading estimates and guidelines regarding BMPs. The review process provides an opportunity to promote awareness of BMPs for stormwater control, educate elected officials on the need for vigorous erosion and sedimentation controls and stormwater management programs, and to encourage improved water quality monitoring in the region.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal coliform bacteria may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform bacteria sources. Sanitary sewer leaks and overflows may be a source of fecal coliform bacteria. In addition, previous sampling was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle will be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Strategies for Action: Separate strategies are needed to address nonpoint fecal coliform loading in rural and developed areas.

Urban Areas:

Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles:

- EPD: monitor and assess use support in listed stream segments; administer CSO control efforts, administer stormwater regulations; regulate point sources under the NPDES program; and encourage local government efforts to address nonpoint source pollution.
- ARC: coordinate stormwater management to the Atlanta metro area.

- Local governments: operate and maintain sewer systems and wastewater treatment plants, and stormwater regulations, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local health departments: continue to identify and correct poorly operating septic systems and educate owners about the proper care and maintenance of septic systems.

Specific Management Objectives: Encourage local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level using forums such as the Regional Stormwater Task Force.

Action Plan:

- The City of Atlanta will complete sewer separation to eliminate the Utoy Creek combined sewer overflow by late 1998.
- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- Local governments under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FY 1999. EPD will review these applications during FY 1999.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.

Methods for Tracking Performance: EPD tracks point source discharges through inspections and evaluations of self-monitoring data. Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Rural Areas:

Key Participants and Roles:

- EPD: monitor and assess use support in listed streams, encourage local planning efforts, regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of improved agricultural management practices.
- County and municipal governments: septic system regulations, land use planning guidelines.

Specific Management Objectives: Encourage local watershed planning and management sufficient to ensure that designated water uses are supported.

Management Option Evaluation: Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan:

- EPD will continue to ensure that permitted point sources remain in compliance with fecal coliform bacteria limits.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill are still being worked out, but it is expected that incentives will be targeted to areas of apparent water quality impact, including rural streams which may sustain excessive fecal coliform loads from animal operations.
- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality.

Method for Tracking Performance: Agricultural agencies will track rates of BMP implementation for animal operations. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue C: Nutrients

Problem Statement: The water use classifications of fishing, drinking water, and recreation are potentially threatened in West Point Lake due to inputs of nutrients which may cause excess algal growth in the lakes. Nutrient sources are upstream water pollution control plant discharges and nonpoint sources from urban and agricultural areas. Water quality standards are in place to address nutrients in West Point Lake. At this time water quality data indicate compliance with standards.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: In the late 1980s the EPD conducted water quality studies of West Point Lake. In 1989, based on the results which showed excess concentrations of phosphorus, the EPD required major metropolitan Atlanta water pollution control plants to reduce phosphorus discharge concentrations to 0.75 mg/l. In the early 1990s the Georgia General Assembly passed legislation banning the use of high phosphate detergents in Georgia. The General Assembly also passed legislation assigning to the DNR the responsibility for establishing water quality standards for West Point Lake. The EPD and the Alabama DEM, using USEPA Clean Water Act funds along with local matching funds from the Calloway Foundation conducted a Phase I Diagnostic-Feasibility Study of West Point Lake. The work was done by contract by LaGrange College, the University of Georgia, and Auburn University. The results of the study were used by the EPD to develop water quality standards for the lake. The Board of Natural Resources adopted standards for the lake in September 1995. The standards include a total phosphorus loading standard for the lake and loading standards for three major tributaries to the lake (see Section 5.2.1). The EPD is monitoring the lake and tributaries to assess compliance with the standards.

Major metropolitan area water pollution control plants have achieved compliance with the phosphorus effluent standards with the exception of the City of Atlanta. The City of Atlanta is under EPD Consent Order to meet the 0.75 mg/l phosphorus limit. In February, 1997 the City of Atlanta is required to achieve compliance with a phosphorus limit of 0.64 mg/l. Failure to achieve compliance will result in Atlanta paying monthly penalties and incurring a sewer connection moratorium. In recent years EPD has required smaller water pollution control plants in the watershed to reduce effluent phosphorus concentration. Orders with compliance schedules for meeting limits are in place for several of these facilities.

EPD is also conducting major water quality modeling projects, supported in part by ARC local government members and the USEPA, on the Chattahoochee River and West Point Lake. The models will provide tools which will be useful in evaluating nutrient loading scenarios and providing much needed technical predictions necessary for future water resource decision making.

Identified Gaps and Needs: Ongoing monitoring will provide information for evaluation of standards compliance.

Strategies for Action: Lake standards adopted for West Point Lake and requirements placed on area wastewater treatment plants along with the stormwater management program for metropolitan Atlanta constitute respectively nutrient loading standards and the strategies for complying with the standards. The EPD is monitoring to assess compliance with the standards. Standards are being met at this time. Should water quality monitoring results indicate exceedence of standards the EPD will evaluate the results and initiate appropriate action.

Issue D: Erosion and Sedimentation

Problem Statement: The water use classification of fishing is potentially threatened in many segments, by erosion and loading of sediment, which can alter stream morphology, impact habitat, reduce water clarity, and clog drinking water systems. There are 19 stream segments listed in this subbasin as partially supporting designated uses due to poor fish communities. Sediment may be a factor influencing fish communities in these areas. Potential sources include

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

General Goals: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Ongoing Efforts: With Section 319(h) FY 94 Grant funds, the City of Atlanta has implemented the Proctor Creek Streambank Restoration and Watershed Management Projects. The Streambank Restoration Project will address sediment loads in Proctor Creek caused by erosion, undercutting, and incision of the stream channel. The objective of the Watershed Management Program is to reduce nonpoint source pollution from urban runoff through public awareness programs, training workshops, and the implementation of best management practices. As of Federal FY 96, a feasibility study has been completed for a demonstration site constituting a 400 foot section of Proctor Creek.

With local funding, the Atlanta Regional Commission (ARC) and the Chattahoochee-Flint Regional Development Commission (CFRDC) have initiated the South Chattahoochee Corridor Plan to create an area-wide development and protection plan for the Chattahoochee River from Peachtree Creek to Franklin, GA. During FY 96, an inventory of existing conditions was completed.

Section V of the Georgia Planning Act requires local governments to develop comprehensive plans for protection of critical natural resources, including water supply watersheds. The Chattahoochee-Flint RDC has developed model ordinances and will target resources toward local adoption of overlay zones to provide protection of water supply watersheds. The River Corridor Protection Act establishes corridors along major rivers as critical natural resources. The Chattahoochee-Flint RDC has also developed a model ordinance for river corridor protection which is applicable to the Chattahoochee River above West Point Lake.

The 1992 GFC compliance survey examined 17 sites in this HUC and found 94% of harvested acreage in compliance with forestry BMPs, but only 73% of road miles in compliance. GFC is targeting education to increase compliance with BMPs for forest roads to reduce erosion.

GSWCC has recently updated, and has made available for distribution, the Manual for Erosion and Sedimentation Control in Georgia, which will be distributed to personnel working on erosion and sedimentation issues throughout the state.

Identified Gaps and Needs: Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring. Stream segments currently listed as partially supporting were based on fish IBI (Index of Biotic Integrity) studies conducted by the WRD in this area of the state. EPD is also developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. These tools provide methods for detecting and quantifying impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

Rural roads are thought to be a contributor to sedimentation but the amount is unclear. Further monitoring may be needed to quantify the impact of rural roads as a source of sedimentation into streams.

A key need for developing strategies to address erosion, sedimentation, and habitat issues in urban streams is definition of appropriate management goals. It is likely that streams with highly urbanized watersheds cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD and other stakeholders.

Strategies for Action: Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles:

- EPD and WRD: monitor and assess use support in listed waters; encourage water quality improvement efforts; and continue the development of biomonitoring methods.
- ARC: urban best management practices and coordinate the stormwater strategy.
- Local governments: where the issuing authority enforce erosion controls for construction practices.
- GSSWC and local S&WCDs and RC&Ds with assistance from NRCS: encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC: continue to monitor and encourage implementation of forestry BMPs to control erosion.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Management Option Evaluation: During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan:

- EPD and WRD will continue to develop RBMP capabilities designed to assess aquatic life impairment.
- EPD will propose a plan for the next basin cycle sampling of streams listed due to poor fish communities and conduct appropriate sampling by December 2000, in accordance with the statewide RBMP management cycle.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- ARC: coordinate urban best management practices and the stormwater strategy.
- The Chattahoochee-Flint RDC and the ARC will assist local governments in adaptation of model ordinances and amendments to local zoning ordinances for water supply watershed protection and river corridor protection during FFY 1998-2001.

- Local governments with issuing authority will enforce erosion controls for construction practices.
- GSSWC will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will target landowner and user groups for BMP education to ensure compliance with forestry BMP guidelines.
- The basin team will re-evaluate listed stream status and management strategies during the next basin cycle, scheduled for 2001.

Method for Tracking Performance: GSWCC and GFC will track BMP implementation. Local governments will track erosion and sediment control programs. A reevaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue E: Water Temperature

Problem Statement: The segment of the Chattahoochee from Peachtree Creek to Utoy Creek is designated as a secondary trout water. The water use classification of fishing is not fully supported in this segment due to elevated water temperature associated with wastewater discharges, power plant operation, and urban runoff from impervious areas.

General Goals: Meet water quality standards to support water uses.

Ongoing Efforts: The ongoing efforts identified for HUC 03130001, Area B, Issue C (Section 7.2.2) also apply in this segment.

Identified Gaps and Needs: At this point it is not known whether temperature standards for secondary trout waters are reasonably attainable within this segment.

Strategies for Action: The strategies identified for HUC 03130001, Area B, Issue C also apply in this segment. In addition, this segment is impacted by thermal loads from two wastewater treatment facilities and a coal-fueled electric power plant. EPD will use the CRMP model to evaluate whether NPDES permit limits on thermal loads for these dischargers need to be revised. As part of this effort, EPD will evaluate whether temperature standards for secondary trout waters can be reasonably expected to be attained within this segment. If not, EPD may propose a revision of the use classification for this segment to remove its designation as a secondary trout water.

Issue F: Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in the Chattahoochee River mainstem or in West Point Lake based on fish consumption guidelines due to PCBs and chlordane in the river segment and PCBs in the lake. The guidelines are for largemouth and striped bass, carp, and channel catfish in the river and for largemouth and

hybrid bass, carp, and channel catfish in the lake. The use of PCBs and chlordane are banned in the United States.

General Goals: Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts: DNR has monitored fish within this segment of the Chattahoochee River and West Point Lake and issued fish consumption guidelines. There are no known point source discharges of PCBs or chlordane in the watershed. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were used regularly as fluids for electrical transformers, cutting oils, and carbonless paper. Although they were banned in 1976, they do not break down easily and remain in sediment for years. Chlordane is a man-made pesticide which was used in the 1940s to the early 1980s as an agricultural pesticide. In 1978 chlordane was restricted to termite control use only. All uses of chlordane were banned in the United States in the 1980s. Chlordane is persistent in the environment and may remain in sediment for many years.

Identified Gaps and Needs: There are no known sources of PCBs or chlordane within the watershed.

Strategies for Action: Because the PCBs and chlordane are not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles:

- EPD and WRD: sample fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives: EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan:

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2000 in accordance with the river basin monitoring cycle.

7.2.4 Hydrologic Unit 03130002, Area B (West Point Dam to Columbus)

The Chattahoochee River in this area forms the Georgia-Alabama border from West Point Dam to the Fall Line just above Columbus, Georgia. Flow of the river in this section is highly controlled by a series of dams. Land use is predominantly rural.

The concerns identified for portions of this subbasin include metals concentrations, fecal coliform bacteria, erosion and sedimentation, low dissolved oxygen, and concentrations of PCBs and chlordane in fish.

Issue A: Metals

Problem Statement: The water use classification of fishing was not fully supported in Long Cane Creek in the LaGrange area and in Goat Rock Lake due to exceedance of the water quality standards for metals. Copper, lead, and zinc standards were exceeded in Long Cane Creek and the copper standard was exceeded in Goat Rock Lake. The metals in Long Cane Creek may be attributed to a combination of effluent from a LaGrange water pollution control plant discharge and urban runoff and in Goat Rock Lake to nonpoint sources. The LaGrange water pollution control plant discharge has been removed from the creek.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Metals concentrations in Long Cane Creek were primarily attributed to the discharge from the LaGrange water pollution control plant. The discharge was diverted to the Chattahoochee River in 9/93. New data are needed to determine current metals concentrations.

Identified Gaps and Needs: The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded. In the case of Long Cane Creek, additional data need to be collected to determine if metals concentrations continue to be in excess of standards after the discharge was removed. Also, as the watershed includes drainage area in Alabama, Georgia may need to work cooperatively with the Alabama DEM to develop strategies to assess copper in Goat Rock Lake.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring may be appropriate to measure impacts along with concentrations of metals.

Strategies for Action: EPD will conduct additional monitoring during the next basin cycle to determine if metals in these two waterbodies continue to exceed water quality standards.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters and encourage local efforts to address nonpoint sources of pollution.
- Local governments: stormwater management strategies, erosion and sedimentation control, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Meet water quality standards to support designated uses. Initial work will be to conduct additional sampling to determine if metals concentrations continue to exceed water quality standards.

Management Option Evaluation: Options will be evaluated following analysis of future sampling results.

Action Plan:

- EPD will complete a review of existing metals data in listed segments by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of the listed waters and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: To be proposed as strategies are refined.

Issue B: Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in five stream segments in the LaGrange area and three stream segments in rural areas due to exceedances of the water quality standard for fecal coliform bacteria. These may be attributed to a combinations of urban runoff, septic systems, sanitary sewer overflows, agriculture, rural nonpoint, and natural sources.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: None identified.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal coliform bacteria may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows may be a source of fecal coliform bacteria. In addition, previous sampling has not been conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle may be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Strategies for Action: Separate strategies are needed to address nonpoint fecal coliform loading for urban and agricultural sources.

Urban Areas:

Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year

phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2001-September 2002, in accordance with the statewide RBMP management cycle.

Key Participants and Roles:

- EPD: monitor and assess use support in listed stream segments and encourage local efforts to address nonpoint source pollution.
- Local governments: operate and maintain sewer systems and wastewater treatment plants, develop stormwater programs, monitor land application systems, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local health departments: continue to identify and correct poorly operating septic systems and educate owners about the proper care and maintenance of septic tank systems.

Specific Management Objective: Encourage local watershed planning and management sufficient to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level.

Action Plan:

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will encourage local planning to address stormwater management.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December, 2000, in accordance with the statewide RBMP management cycle.

Methods for Tracking Performance: EPD tracks point source discharges through inspections and evaluations of self-monitoring data. An evaluation of the status of listed waterbodies will

be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Rural Areas:

Key Participants and Roles:

- EPD: monitor and assess use support in listed streams, encourage local planning efforts, and regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of agricultural management practices.
- County and municipal governments: septic system regulations, land use planning guidelines.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives : Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan:

- EPD will continue to ensure that permitted point sources remain in compliance with fecal coliform bacteria limits.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill are still being worked out, but it is expected that incentives will be targeted to areas of apparent water quality impact, including rural streams which may sustain excessive fecal coliform loads from animal operations.
- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality.

Method for Tracking Performance: Agricultural agencies will track rates of BMP implementation for animal operations. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue C: Erosion and Sedimentation

Problem Statement: The water use classification of fishing is potentially threatened by erosion and loading of sediment, which can alter stream morphology, impact habitat, reduce water clarity, and clog drinking water systems. Sediment may be a factor influencing fish communities in these areas. Potential sources include urban runoff and development

(particularly construction), unpaved rural roads, forestry practices, and agriculture. There are no stream segments listed at this time in this subbasin as not fully supporting designated water uses due to poor fish communities or sedimentation.

General Goals: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Ongoing Efforts: GSWCC has recently updated, and has made available for distribution, the Manual for Erosion and Sedimentation Control in Georgia, which will be distributed to personnel working on erosion and sedimentation issues throughout the state.

The 1992 GFC compliance survey examined 17 sites in this HUC and found 94% of harvested acreage in compliance with forestry BMPs, and 73% of road miles in compliance. GFC is targeting education to increase compliance with BMPs for forest roads to reduce erosion.

Identified Gaps and Needs: Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. The WRD is working with the IBI (Integrated Biotic Index) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

Rural roads are thought to be a significant contributor to sedimentation but the magnitude of this contribution is unclear. Further monitoring may be needed to quantify the impact of rural roads as a source of sedimentation into streams.

A key need for developing strategies to address erosion, sedimentation, and habitat issues in urban streams is definition of appropriate management goals. It is likely that streams with highly urbanized watersheds cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD and other stakeholders.

Strategies for Action: Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles:

- EPD and WRD: monitor and assess use support in listed waters; encourage water quality improvement efforts; and continue the development of biomonitoring methods.
- Local governments: where the issuing authority enforce erosion controls for construction practices and land use planning.
- GSSWC and local S&WCDs and RC&Ds with assistance from NRCS: encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC: continue to monitor and encourage implementation of forestry BMPs to control erosion.

- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Management Option Evaluation: During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan:

- EPD and WRD will continue to develop RBP capabilities designed to assess aquatic life impairment.
- EPD will propose a plan for the next basin cycle sampling of streams listed due to poor fish communities and conduct appropriate sampling by December 2000, in accordance with the statewide RBMP management cycle.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- The basin team will re-evaluate listed stream status and management strategies during the next basin cycle, scheduled for 2001.
- Local governments with the issuing authority will enforce erosion controls for construction practices.
- GSSWC will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will target landowner and user groups for BMP education to ensure compliance with forestry BMP guidelines.

Method for Tracking Performance: GSWCC and GFC will track BMP implementation. Local governments with the issuing authority, will track erosion and sediment control programs. A reevaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue D: Dissolved Oxygen

Problem Statement: The fishing water use classification was not fully supported in one segment of the Chattahoochee River and in two tributary segments due to dissolved oxygen concentrations less than standards. Low dissolved oxygen in the river segment was due to bottom water discharges from West Point Lake and in the tributaries due to nonpoint sources.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: The Corps of Engineers conducts ongoing monitoring of water quality of releases from West Point Dam and is considering alternatives to improve dissolved oxygen

concentrations. One tributary with low dissolved oxygen was Long Cane Creek. The LaGrange water pollution control plant discharge to Long Cane Creek was removed in 9/93.

Identified Gaps and Needs: Causes of low dissolved oxygen in Ollie Creek are uncertain at this time.

Strategies for Action: The Corps of Engineers will work on the assessment and implementation of feasible actions to maintain acceptable dissolved oxygen concentrations in waters released from the dam.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters.
- The Corps of Engineers: owns and operates the dam.

Specific Management Objectives: Meet water quality standards to support designated water uses.

Management Option Evaluation: The Corps of Engineers will evaluate alternatives for improving dissolved oxygen concentrations in releases from West Point dam.

Action Plan:

- The EPD will monitor and assess use support in listed waters and will work with the Corps to evaluate cost-effective changes in dam operation to improve dissolved oxygen concentrations in releases from West Point Dam.
- The Corps of Engineers will evaluate alternatives in dam operations to improve dissolved oxygen concentrations in releases from West Point Dam.

Methods for Tracking Performance. A reevaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue E: Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in Lake Harding, Goat Rock Lake, and Lake Oliver based on fish consumption guidelines. PCBs and mercury were the cause of consumption guidelines. The guidelines are for largemouth and hybrid bass, channel catfish, crappie, black crappie, catfish, and spotted sucker.

General Goals: Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts: DNR has monitored fish in Lake Harding, Goat Rock Lake, and Lake Oliver and issued fish consumption guidelines. There are no known point source discharges of PCBs in the watershed. It is now illegal to manufacture PCBs: however, in the past, these synthetic oils were used regularly as fluids for electrical transformers, cutting oils, and carbonless paper. Although they were banned in 1976, they do not break down easily and remain in sediment for years.

Identified Gaps and Needs: There are no known sources of PCBs within the watershed. Mercury within Lake Oliver is likely derived from natural sources or from atmospheric deposition.

Strategies for Action: Because the loads of PCBs and mercury are not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants and Roles:

- EPD and WRD: sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives: EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan:

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2000 in accordance with the river basin monitoring cycle.

Method of Tracking Performance: Trends in fish tissue concentration; number of fish consumption guidelines required.

7.2.5 Hydrologic Unit 03130003 (Columbus to Lake W. F. George)

This area begins in the urban area of Columbus at the Fall Line and extends through Lake Walter F. George. Land use below Columbus is primarily rural, with significant amounts of agricultural and silvicultural land use. A large part of the direct drainage to this area is located in Alabama.

The concerns identified for portions of this subbasin include metals concentrations, fecal coliform bacteria, erosion and sedimentation, nutrients, and concentrations of PCBs and chlordane in fish tissue.

Issue A: Metals

Problem Statement: The water use classification of fishing was not fully supported in 11 river tributary stream segments in the Columbus area due to exceedance of the water quality standard for copper. Copper and lead standards were also exceeded in the Chattahoochee River below Columbus. The metals may be attributed to urban runoff.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Columbus has implemented a program to treat discharges from combined sewer overflows (CSOs) The plan includes continued release with solids separation and

disinfection at two overflow locations which may continue to introduce some intermittent metals loads into the Chattahoochee. In addition, The City of Columbus, working through the Water Environment Federation, received a \$20 million grant from USEPA to conduct a full-scale research project to test the effectiveness of various combination of vortex separation, dissolved air Flotation, and UV disinfection on CSOs. This work was recently completed and will result in improved control of residual loads from Columbus CSOs. It will also provide valuable information to be shared with other U.S. communities developing plans for CSO control.

EPD issued a NPDES Municipal Separate Storm Sewer Systems (MS4) Discharge Permit to the Columbus Consolidated Government on April 20, 1995. This permit requires the Consolidated Government to implement a storm water management program to address the discharge of pollutants from their storm sewer system to the Chattahoochee River basin. This program is now in its third year. The management program includes structural controls and best management practices for reducing runoff pollution from public, residential, commercial, and industrial areas. Illicit discharge detection, wet and dry weather monitoring, public education, and citizen involvement are important components of this management program, and a comprehensive Storm Water Management Ordinance (Council Resolution 97-33) was adopted in April, 1997. A committee of concerned stakeholders will aid in the development of a Storm Water Design Manual for addressing long-term storm water control in the Columbus area.

Identified Gaps and Needs: EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, the first step to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded. Also, as the watershed includes significant drainage area in Alabama, Georgia will need to work cooperatively with the Alabama DEM to develop strategies to assess metal concentrations in the river.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Additional biological monitoring may be appropriate to measure impacts along with concentrations of metals. Restoration goals for urban streams are not clearly defined. Consideration should be given to the interaction of metals and habitat degradation: mitigation of metals may have little beneficial impact unless habitat issues are also addressed. It is probable, however, that streams with highly urbanized watersheds cannot be restored to pristine "natural" conditions.

Strategies for Action: Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation.

Key Participants and Roles:

- EPD: monitor and assess use support in listed waters; administer stormwater regulations; encourage local efforts to address nonpoint sources of pollution.

- Local governments: stormwater management strategies, erosion and sedimentation control enforcement, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Encourage local government watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level.

Action Plan:

- EPD will complete a review of existing metals data in listed segments by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling of streams identified as not supporting or partially supporting designated uses and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- EPD will continue to administer the stormwater regulations and will encourage local planning to address stormwater management.
- The Columbus Consolidated Government under the Phase I stormwater program will submit annual reports and apply for renewal of existing permits in FY 1999. EPD will review these applications during FY 1999.
- EPD will continue to develop Rapid Bioassessment Protocol capabilities designed to assess impairment of aquatic life.
- EPD will encourage involvement of citizen groups through the Adopt-A-Stream program to address restoration of urban streams.
- The basin team will re-evaluate stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue B: Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in seven stream segments due to exceedances of the water quality standard for fecal coliform bacteria. Elevated fecal coliform bacteria concentrations in the Chattahoochee River (two segments) downstream of Columbus may be attributed to CSOs and urban runoff. Urban runoff is the

likely source of violations in four river tributaries in the Columbus area and rural nonpoint sources the source of violations in two tributaries to Lake Walter F. George.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: Wastewater treatment facilities within this area are in compliance with permit limits for fecal coliform bacteria.

Excursions of water quality standards associated with Columbus CSOs have been mitigated by solids removal and disinfection at remaining outfalls. Columbus has implemented a program to treat discharges from combined sewer overflows (CSOs). The plan includes continued release with solids separation and disinfection at two overflow locations which may continue to introduce some intermittent bacteria loads into the Chattahoochee. In addition, the City of Columbus, working through the Water Environment Federation, received a \$20 million grant from USEPA to conduct a full-scale research project to test the effectiveness of various combination of vortex separation, dissolved air flotation, and UV disinfection on CSOs. This work was recently completed and will result in improved control of residual loads from Columbus CSOs. It will also provide valuable information to be shared with other U.S. communities developing plans for CSO control.

EPD issued a NPDES Municipal Separate Storm Sewer Systems (MS4) Discharge Permit to the Columbus Consolidated Government on April 20, 1995. This permit requires the Consolidated Government to implement a storm water management program to address the discharge of pollutants from their storm sewer system to the Chattahoochee River Basin. This program is now in its third year. The management program includes structural controls and best management practices for reducing runoff pollution from public, residential, commercial, and industrial areas. Illicit discharge detection, wet and dry weather monitoring, public education, and citizen involvement are important components of this management program, and a comprehensive Storm Water Management Ordinance (Council Resolution 97-33) was adopted in April, 1997. A committee of concerned stakeholders will aid the Consolidated Government in developing a Storm Water Design Manual for addressing long-term storm water control in the Columbus area.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, fecal coliform bacteria may be attributable to natural sources (e.g., wildlife); alternative bacteriological sampling methods may be useful to distinguish between human, other mammalian, and avian fecal coliform sources. Sanitary sewer leaks and overflows may be a source of fecal coliform bacteria. As the watershed includes significant drainage area in Alabama, Georgia will need to work cooperatively with the Alabama DEM to develop strategies to reduce fecal coliform bacteria levels in the river. In addition, previous sampling was not conducted at a sufficient frequency to determine whether the monthly geometric mean criterion specified in the standard has actually been violated. Thus, an initial effort in the next RBMP cycle may be to collect an adequate number of samples (four over a 30-day period) to support geometric mean calculations to determine if water quality standards are actually being exceeded.

Strategies for Action: Separate strategies are needed to address nonpoint fecal coliform loading for urban and agricultural sources.

Urban Areas:

Addressing urban runoff will be a complex task, requiring a strong local component. Management of urban runoff is needed to address a variety of water quality problems, including metals, fecal coliform bacteria, nutrients, and habitat degradation. For this five year phase of the basin management cycle, management will concentrate on source control and planning. Evaluation of the efficacy of this approach will be made during the basin strategy re-evaluation scheduled for October 2002-September 2003, in accordance with the statewide RBMP management cycle.

Key Participants and Roles:

- EPD: monitor and assess use support in listed stream segments; administer CSO control efforts; and encourage local efforts to address nonpoint source pollution.
- Local governments: operate and maintain sewer systems and wastewater treatment plants, monitor land application systems, and stormwater programs, zoning and land use planning, local watershed initiatives, and monitoring programs.
- Local health departments: continue to identify and correct poorly operating septic systems and educate owners about the proper care and maintenance of septic tank systems.

Specific Management Objectives: Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Integrated management options will be proposed and evaluated primarily at the local level.

Action Plan:

- EPD will continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for fecal coliform bacteria. EPD will also request a comprehensive watershed assessment, looking at both point and nonpoint sources, from localities applying for new or expanded NPDES point source discharge permits. The intent is to direct localities' attention to current and future nonpoint source issues in their watershed and to have them consider ways to prevent or control water quality impacts due to growth. Approved watershed management steps will be included as a condition for expansion of existing water pollution control plants or construction of new plants.
- EPD will continue to administer the stormwater program and encourage local planning to address stormwater management.
- EPD will encourage local authorities to institute programs to identify and address illicit sewage discharges, leaks and overflows of sanitary sewers, and failing septic tanks within their jurisdictions.
- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- EPD will complete reassessment of fecal coliform bacteria monitoring protocols and will propose a plan for resampling of streams identified as not supporting or partially

supporting designated uses and complete sampling by December, 2000, in accordance with the statewide RBMP management cycle.

Methods for Tracking Performance: EPD tracks point source discharges through inspections and evaluations of self-monitoring data. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Rural Areas:

Key Participants and Roles:

- EPD: monitor and assess use support in listed streams, encourage local planning efforts, regulate point sources under the NPDES program.
- GSWCC and local SWCDs and RC&D councils with assistance from NRCS: promote implementation of agricultural management practices.
- County and municipal governments: septic system regulations, and land use planning guidelines.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Encourage local watershed planning and management to ensure that designated water uses are supported.

Management Option Evaluation: Evaluation will be on a site-by-site basis. For agricultural BMP support, existing prioritization methods of the agricultural agencies will be used.

Action Plan:

- EPD will continue to ensure that all permitted point sources remain in compliance with fecal coliform bacteria limits.
- GSWCC and local agricultural agencies will continue to support adoption of BMPs for animal waste handling. Methods for prioritization and implementation of cost-share incentives under the 1996 Farm Bill are still being worked out, but it is expected that incentives will be targeted to areas of apparent water quality impact, including rural streams which may sustain excessive fecal coliform loads from animal operations.
- DHR is in the process of developing new regulations for septic systems. DHR will work to educate local governments and citizen groups about the need for adequate regulation and maintenance of septic systems to protect water quality.

Method for Tracking Performance: Agricultural agencies will track rates of BMP implementation for animal operations. An evaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue C: Erosion and Sedimentation

Problem Statement: The water use classifications of fishing and recreation 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. There are no stream segments listed at this time in this subbasin as not fully supporting designated water uses due to poor fish communities or sedimentation.

General Goals: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Ongoing Efforts: GSWCC has recently updated, and has made available for distribution, the *Manual for Erosion and Sedimentation Control in Georgia*, which will be distributed to personnel working on erosion and sedimentation issues throughout the state.

GFC conducted a BMP compliance survey in 1992 on 10 sites in this HUC and documented found 95% of harvested acreage in compliance with BMPs, and 70% of forest roads in compliance. GFC is targeting education to increase compliance with BMPs for forest roads to reduce erosion.

Identified Gaps and Needs: Adverse impacts of excess sediment loading include degradation of habitat and reduction in species diversity. These types of impacts are best addressed through biological monitoring. EPD is developing increased capability for biomonitoring using Rapid Bioassessment Protocols (RBPs) for benthic macroinvertebrates. The EPD protocols include habitat assessment. The WRD is working with the IBI (Integrated Biotic Index) to assess fish communities. These tools will provide methods to detect and quantify impairment of aquatic life resulting from habitat-modifying stressors such as sediment, as well as impacts from other stressors.

Rural roads are thought to be a significant contributor to sedimentation but the amount is unclear. Further monitoring may be needed to quantify the impact of rural roads as a source of sedimentation into streams.

A key need for developing strategies to address erosion, sedimentation, and habitat issues in urban streams is definition of appropriate management goals. It is likely that streams with highly urbanized watersheds cannot be returned to "natural" conditions. An appropriate restoration goal needs to be established in consultation between EPD and other stakeholders.

Strategies for Action: Understanding the role of erosion and sedimentation in urban streams is incomplete at this time. Most of these streams are impacted by a variety of stressors. An incremental or phased approach is needed to address these issues.

Key Participants and Roles:

- EPD: encourage local government water quality improvement efforts; and continue the development of biomonitoring methods.
- Local governments: where the issuing authority enforce erosion controls for construction practices and land use planning.

- GSSWC: continue to monitor and encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC: encourage implementation of forestry BMPs to control erosion.
- Citizen groups: Adopt-A-Stream programs and work with local governments on watershed initiatives.

Specific Management Objectives: Control erosion and sedimentation from land disturbing activities in order to meet water quality standards for turbidity.

Management Option Evaluation: During this iteration of the basin cycle, management will focus on source control BMPs.

Action Plan:

- EPD will encourage citizen involvement through Adopt-A-Stream groups to address restoration of urban streams.
- Local governments with the issuing authority will enforce erosion controls for construction practices.
- GSSWC will encourage the implementation of BMPs to control erosion of agricultural lands.
- GFC will target landowner and user groups for BMP education to encourage compliance with forestry BMP guidelines.
- EPD and WRD will continue to develop biological monitoring capabilities designed to assess aquatic life.

Method for Tracking Performance: GSWCC and GFC will track BMP implementation.

Issue D: Nutrients

Problem Statement: The water use classification of recreation is potentially threatened in Lake Walter F. George due to inputs of nutrients which may cause excess algal growth in the lake. Potential sources may include municipal or industrial point source discharges or nonpoint sources from urban runoff or agriculture.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: A joint Feasibility Study report, prepared by the EPD and Alabama DEM in 1996, concluded the reservoir was in relatively good condition. No water use impacts were documented. The trophic status was, however, documented as eutrophic, so prevention of further degradation is advisable. Therefore, the management of nutrient loading, particularly phosphorus, is an important long-term objective in maintaining the current water quality. On November 6, 1996, the Rules and Regulations for Water Quality Control, Chapter 391-3-6, were revised to include specific water quality standards for Walter F. George. These standards include limits on chlorophyll *a*, pH, total nitrogen, phosphorus loading, fecal coliform bacteria,

and dissolved oxygen in the lake and on phosphorus loading to the lake from the Chattahoochee River. Monitoring for compliance with these standards began in 1997.

Identified Gaps and Needs: Monitoring over time will document water quality and status of compliance with water quality standards.

Strategies for Action: The water quality standards for Lake Walter F. George constitute the strategy for protection of the lake. Monitoring over time will document the status of compliance with water quality standards. If compliance with standards is not maintained strategies will be developed to assess and manage point and nonpoint nutrient sources.

Issue E: Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in the Chattahoochee River mainstem (Oliver Dam to Chattahoochee County) and in Lake Walter F. George based on fish consumption guidelines. PCBs were the cause of the consumption guidelines in the river and mercury, PCBs, and chlordane caused the guidelines in the lake. The guidelines are for channel catfish in the river and for largemouth bass, hybrid bass, and catfish in the lake.

General Goals: Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts: DNR has monitored fish in river and the lake and issued fish consumption guidelines. There are no known point source discharges of PCBs, chlordane or mercury in the watershed. It is now illegal to manufacture PCBs; however, in the past, these synthetic oils were used regularly as fluids for electrical transformers, cutting oils, and carbonless paper. Although they were banned in 1976, they do not break down easily and remain in sediment for years. Chlordane is a man-made pesticide which was used in the 1940s to the early 1980s as an agricultural pesticide. In 1978 chlordane was restricted to termite control use only. All uses of chlordane were banned in the United States in the 1980s. Chlordane is persistent in the environment and may remain in sediment for many years. Mercury is a naturally occurring metal that recycles between land, water, and air. As mercury cycles through the environment it is absorbed and ingested by plants and animals. Most of mercury absorbed will be returned to the environment but some will remain in the plant and animal tissues. It is not known where the mercury in fish originated. Mercury may be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the mercury is related to global atmospheric transport.

Identified Gaps and Needs: There are no known sources of loads of PCBs or chlordane in the watershed. Mercury in the area is likely derived from natural sources or from atmospheric deposition.

Strategies for Action: Because the PCBs, chlordane, or mercury are not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants:

- EPD and WRD: sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives: EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan:

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2000 in accordance with the river basin monitoring cycle.

7.2.6 Hydrologic Unit 03130004 (Lake W. F. George to Lake Seminole)

The southernmost portion of the Chattahoochee River basin runs from the Lake Walter F. George Dam to Lake Seminole, and contains parts of Georgia, Alabama, and Florida. The land area within Georgia is relatively small and sparsely populated.

The concerns identified for portions of this subbasin include metals concentrations, dissolved oxygen, nuisance weeds, and concentrations of mercury in fish.

Issue A: Metals

Problem Statement: The water use classification of recreation was not fully supported in one segment of the Chattahoochee River due to exceedance of the water quality standard for lead from nonpoint sources.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: None identified.

Identified Gaps and Needs: The EPD is concerned with the accuracy of many of the stream assessments showing criteria violations for metals, as, in many cases, the metals database was minimal with as little as one data point showing a concentration in excess of stream standards. Further, there are quality assurance concerns with much of the earlier metals data, as it is now evident that clean and ultra clean techniques for sample collection and laboratory testing are necessary to produce quality assured data. Thus, an initial effort to address this issue will be to collect additional samples using clean techniques to determine if water quality standards are actually being exceeded.

It is also unclear how occasional standards violations translate into actual risk to aquatic life. Georgia standards for metals may need to be reevaluated in light of recent EPA guidance on use of the dissolved fraction of total metal concentrations to calculate risk to aquatic life. Biological monitoring may be appropriate to measure impacts along with concentrations of metals.

Strategies for Action: The strategy to address lead will focus on a better definition of the existence and extend of the problem.

Key Participants and Roles:

- EPD: monitor and assess use support in the listed water. Identification of other participants will depend on the confirmation of a problem and any potential causes.

Specific Management Objectives: EPD will monitor to document lead concentrations in this segment of the Chattahoochee River. If data show lead to be an issue, options will be developed to assess sources and potential control alternatives.

Management Option Evaluation: Not applicable at this time.

Action Plan:

- EPD will complete a review of existing metals data in the listed water by September 1999, in accordance with the statewide RBMP management cycle.
- EPD will propose a plan for resampling this segment of the Chattahoochee River and complete sampling by December 2000, in accordance with the statewide RBMP management cycle.
- The basin team will re-evaluate listed stream status and management strategies during the next basin cycle, scheduled for 2001.

Methods for Tracking Performance: An evaluation of the status of the listed segment of the river will be made coincident with the next iteration of the RBMP management cycle for the Chattahoochee River basin in 2001.

Issue B: Dissolved Oxygen

Problem Statement: The fishing water use classification was not fully supported in a segment of the Chattahoochee River downstream of the dam at Walter F. George due to dissolved oxygen concentrations. The low concentrations of dissolved oxygen are a result of releases of bottom water from the dam.

General Goals: Meet water quality standards to support designated water uses.

Ongoing Efforts: In 1993, the Corps of Engineers adopted a Standard Operating Procedure (SOP) that includes a system to detect low oxygen conditions and sound an alarm. When the alarm sounds, water is spilled from the surface of the reservoir to increase the oxygen levels. Under this SOP, oxygen in the tailrace must get below 2 ppm before the alarm is triggered. The Corps is also concerned with safety issues and sediment loading caused by seepage problems at the dam.

Identified Gaps and Needs: None identified.

Strategies for Action: The EPD will work with Corps of Engineers to assess and implement feasible actions to maintain acceptable dissolved oxygen concentrations. The COE plans to

implement a rehabilitation project of the W. F. George Lock and Dam during FFY 1999/2000. The rehabilitation project will deal with the seepage problems at the day.

Issue C: Nuisance Weeds

Problem Statement: The water use classifications of fishing and recreation are threatened in Lake Seminole due to the presence of nuisance aquatic plant species.

General Goals: Monitor and manage the populations of nuisance aquatic plants.

Ongoing Efforts: The U.S. Army Corps of Engineers uses several methods in attempting to control nuisance plant growth in Lake Seminole. The Corps has proposed an integrated strategy involving traditional herbicide treatments, confined release of triploid grass carp, a herbicide drip system in Spring Creek, and experimental plantings of native vegetation.

Identified Gaps and Needs: Work should be continued by the Corps to inventory aquatic weed populations in the lake.

Strategies for Action: Nuisance weeds will be addressed through continuation of the existing COE control programs. WRD will provide assistance as needed.

Issue D: Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in Lake Seminole based on fish consumption guidelines due to mercury. The guidelines are for bullhead.

General Goals: Work to protect human health by providing guidelines for consumption of fish.

Ongoing Efforts: DNR has monitored fish in Lake Seminole and issued a fish consumption guideline. There are no known point source discharges of mercury into the Lake Seminole watershed.

Identified Gaps and Needs: Mercury is a naturally occurring metal that recycles between land, water, and air. As mercury cycles through the environment, it is absorbed and ingested by plants and animals. Most of mercury absorbed will be returned to the environment but some will remain in the plant and animal tissues. It is not known where the mercury in fish originated. Mercury may be present in fish due to mercury content in the soils, from municipal and industrial sources, or from fossil fuel use. It is also possible that the mercury is related to global atmospheric transport.

Strategies for Action: Because the source of mercury is not originating from any known point sources, the strategy is to keep the fishing public notified of risks associated with fish consumption.

Key Participants:

- EPD and WRD: sample the fish tissue and issue the fish consumption guidelines as appropriate.

Specific Management Objectives: EPD and WRD will work to protect public human health by issuing fish consumption guidelines as needed, indicating the recommended rates of consumption of fish from specific waters. The guidelines are based on conservative assumptions and provide the public with factual information for use in making rational decisions regarding fish consumption.

Action Plan:

- WRD and EPD will continue to sample and analyze fish tissue and issue fish consumption guidelines as needed. The next round of fish tissue sampling for this reach will be considered in 2000 in accordance with the river basin monitoring cycle.

References

Hall, K. and T. Richards. 1997. Urban watershed initiatives: a City of Atlanta case study. pp. 233-236 in Proceedings of the 1997 Georgia Water Resources Conference, March 20-22, 1997, The University of Georgia, Athens, GA

Hatcher, K.J. 1994. Diagnostic/Feasibility Study of Lake Sidney Lanier, Georgia. Project Completion Report prepared for Georgia Environmental Protection Division, Atlanta, GA

Leigh, D.S. and D.W. Gamble. 1997. Survey of nonpoint trace metal inputs to Lake Lanier. pp. 170-171 in Proceedings of the 1997 Georgia Water Resources Conference, March 20-22, 1997, The University of Georgia, Athens, GA