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. In the Flint 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 Flint 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 water body. 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 in stream 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 in stream 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:

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

1. An intake on a flowing stream (as opposed to being located within a reservoir) shall have no specified minimum criteria; and

2. 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 increase within the Flint 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 Flint River Basin.

Development of A Series of Watershed Protection Templates

Through funding provided by EPA under the provision 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 SWAP's will essentially identify the more likely sources of contamination of the water supply in the watershed, and the SWP's 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 water bodies 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 to 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 Flint 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 Flint River will be addressed in the second round of basin planning. The second round of basin planning for the Flint 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 wastewater and effluents 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 in stream 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 Flint River Basin. The funding for these projects has come from state and federal construction grants and the citizens of local municipalities.

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 in stream concentration of 0.011 mg/l, the permitted flow of the facility, 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 effluent 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 will be required to meet ammonia limits for toxicity if those limits are more stringent than in stream dissolved oxygen based limits. Existing facilities will not be required to meet ammonia limits based on calculated toxicity unless actual toxicity has been identified through toxicity tests.

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

Georgia does not have statewide numeric effluent or in stream standards for phosphorus, and there are currently no site-specific major lake water quality standards in place within the Flint basin. Should site-specific standards be developed for Lake Blackshear or Worth, then point sources upstream of the lake would be required to control phosphorus loading such that in-lake uses are met. This has already occurred in the Chattahoochee River basin upstream of West Point Lake, where site-specific standards have been enacted.

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 Stormwater Regulations on November 16, 1990. EPD subsequently received delegation from the USEPA in January 1991 to issue General Permits and regulate stormwater 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 stormwater from the MS4s which they own or operate, and incorporate detailed stormwater management programs. These programs may include such measures as structural and non-structural controls, best management practices, inspections, enforcement and public education efforts. Stormwater management ordinances, erosion and sediment control ordinances, development regulations and other local regulations provide the necessary legal authority to implement the stormwater 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 stormwater 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. There are no medium size municipal systems (population 100,000 to 250,000) within the Flint basin.

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 Stormwater 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 stormwater management program guidance. In addition, the ARC organized and coordinated the stormwater discharge characterization sampling and modeling efforts for the permit applications, and currently facilitates area stormwater management through its activities with the Atlanta Region Stormwater Management Task Force, coordination of the Atlanta Regional Stormwater 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 stormwater 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 stormwater pollution prevention plan, and in some cases, the monitoring of stormwater discharges from the facility. As with the municipal stormwater permits, implementation of site-specific best management practices is the preferred method for controlling stormwater runoff.

Currently there are 288 facilities in the Flint River Basin that have submitted NOIs for coverage under the general permit for stormwater discharges associated with industrial activities. As with the municipal systems, implementation of Phase II of Federal stormwater permitting is expected to result in a greater number of facilities becoming regulated to control stormwater 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 nonpoint source categories:

Agriculture
- Non-irrigated crop production
- Irrigated crop production
- Specialty crop production (e.g., truck farming and orchards)
- Pasture land
- Range land
- Feedlots - all types
- Aquaculture
- Animal holding / management areas

Silviculture
- Harvesting, reforestation, residue management
- Forest management
- Road construction / maintenance

Construction
- Highway / road / bridge
- Land development
- Urban Runoff
- Storm sewers (source control)
- Combined sewers (source control)
- Surface runoff

Resource Extraction / Exploration / Development
- Surface mining
- Subsurface mining
- Placer mining
- Dredge mining
- Petroleum activities
- Mill tailings
- Mine tailings

Land Disposal (Runoff / Leachate from Permitted Areas)
- Sludge
- Wastewater
- Landfills
- On-site wastewater systems (septic tanks,etc.)
- Hazardous waste

Hydrologic / Habitat Modification
- Channelization
- Dredging
- Dam construction
- Flow regulation / modification
- Bridge construction
- Removal of riparian vegetation
- Streambank modification / destabilization

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

Local government 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: Georgia Soil and Water Conservation Commission, Graham Liles, Executive Director, P.O. Box 8024, Athens, Georgia 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, eight of which are in the Flint 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 GSWCC and the SWCDs is: Georgia Soil and Water Conservation Commission, Graham Liles, Executive Director, P.O. Box 8024, Athens, Georgia 30603, (706) 542-3065.

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. The initial contact for the CAES is Dr. Gale Buchanan, College of Agriculture, University of Georgia, Athens, Georgia, 30602, (706) 542-2151.

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, Georgia 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 professionals 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, filterstrips, 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. During the 1997 Federal fiscal year (FFY 97), Georgia has 19 priority areas, 9 of which are located in the Flint River Basin.

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 cropland, 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 Flint 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 (BMP) and the designation of the Georgia Forestry Commission (GFC) as the lead agency for implementing the

Table 7-1. Flint River Basin - Prioritized and General Appropriations under EQIP

	Priority Consv Appropriations	Resource Concerns			Total
		Water Quality	Soil Erosion	Wildlife Habitats	
3130005					
Financial Assistance	$83,653	$6,998	$1,000	$2,292	$93,943
Educational Assistance	433	30	45	27	535
Technical Assistance	16,731	1,399	200	458	18,788
Total	100,817	8,427	1,245	2,777	113,266
3130006					
Financial Assistance	582,825	-	-	-	582,825
Educational Assistance	2,975	-	-	-	2,975
Technical Assistance	116,565	-	-	-	116,565
Total	702,365	-	-	-	702,365
3130007					
Financial Assistance	207,440	6,998	1,000	2,293	217,731
Educational Assistance	1,071	31	46	28	1,176
Technical Assistance	41,488	1,399	200	459	43,546
Total	249,999	8,428	1,246	2,780	262,453
3130008					
Financial Assistance	316,793	6,999	1,000	2,293	327,085
Educational Assistance	1,624	31	45	28	1,728
Technical Assistance	63,359	1,399	200	459	65,417
Total	381,776	8,429	1,245	2,780	394,230
3130009					
Financial Assistance	130,491	-	-	-	130,491
Educational Assistance	673	-	-	-	673
Technical Assistance	26,098	-	-	-	26,098
Total	157,262	-	-	-	157,262
3130010					
Financial Assistance	114,545	-	-	-	114,545
Educational Assistance	593	-	-	-	593
Technical Assistance	22,909	-	-	-	22,909
Total	138,047	-	-	-	138,047
Grand Total					
Financial Assistance	1,435,747	20,995	14,999	6,878	1,478,619
Educational Assistance	7,369	92	136	82	7,679
Technical Assistance	287,150	4,199	3,000	1,376	295,725

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 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 Flint River Basin, the GFC evaluated 64 sites (21 Piedmont, 36 Upper Coastal Plain and 7 Lower Coastal Plain). Forty eight of the sites were on private land, fifteen on forest industry lands and one public owned lands.

Approximately 73.7 miles of forest roads were evaluated on 59 sites of which 62.5 miles (85%) were in compliance with BMPs. Sixty six 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 26 percent of the sites. At critical areas such as stream crossings, roads were stabilized only on 15 percent of the sites with stream crossings.

Approximately 9,888 harvested acres were evaluated on 64 sites of which 8,915 acres (90%) were in compliance with the BMPs. On 29 sites that needed water bars installed in skid trails, only 1 site (3%) actually installed them. Log decks in critical areas were retired and stabilized on 27 percent of the sites. Logging debris had been left in stream channels on 32 percent of the sites with streams. Random skidder crossings occurred on 56 percent of the sites with streams and temporary stream crossings consisting of debris and dirt were removed on 17 percent of the sites.

Approximately 1,550 site prepared acres were evaluated on three sites of which 1,523 acres (98%) were in compliance with BMPs. No major problems were noted. No regenerated acres were evaluated in the basin.

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 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 nonpoint sources of pollution. 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 nonpoint sources of pollution, the management systems has multiple focuses. Some programs focus on specific sources of urban nonpoint sources of pollution, 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 water body and incorporates integrated management techniques, is particularly critical to protecting or enhancing the quality of urban streams. The quality of urban water bodies 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 nonpoint sources of pollution, 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 nonpoint sources of pollution in general, regulatory requirements, and cooperative or non-regulatory approaches. Units within EPD which have responsibilities related to urban nonpoint sources of pollution 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 nonpoint sources of pollution, activities of the Nonpoint Source Management Program interact strongly with point source controls for combined sewers and storm sewers, both of which discharge urban nonpoint sources of pollution through point conveyances. Current activities for urban surface runoff control include the following:

- Implement local 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 provision 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 and supports 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 an assessment of nonpoint source impacts on groundwater in Albany; support of local stream watch programs in Fulton County; support of a pilot program to set up water-watch programs for neighborhood planning units in the City of Atlanta; and an annual Adopt–A–Stream Conference.

7.1.4 Floodplain Management

Floodplain Management Strategies

The following strategies are to support and strengthen efforts to reduce the risk and impact of flooding.

- Improve the level of awareness, information, and education regarding floodplain management.
- Increase the number of communities participating in the National Flood Insurance Program (NFIP).
- Enhance the effectiveness of floodplain management on the state and local levels.
- Promote the institutionalization of natural hazard mitigation on the state and local levels.

Floodplain management in the State of Georgia is administered through federal regulations and locally adopted 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 NFIP, local political jurisdictions voluntarily adopt Flood Damage Prevention Ordinances, which are based on federal regulations, to enforce and administer floodplain development. Subsequently, the Federal government makes flood insurance available to all residents of the participating community.

Georgia's Floodplain Management Office, located within EPD, serves as liaison between the Federal Emergency Management Agency (FEMA) and local governments participating in the NFIP. 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.

RiverCare 2000 Program

Georgia also has strategies to protect and manage riparian floodplain areas. Of particular relevance is RiverCare 2000, a conservation program which Governor Miller established in September of 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, RiverCare 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 green way; 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 Wetlands Management

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 acreages. 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 southeastern 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 (KFEs) is to introduce youth and their families to the joys of recreational fishing. In 1994, KFEs were conducted in over 90 counties with over 15,000 children fishing in these events.

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-F&WS, Section 6 Federal Aid Program, and USDA-FS Stewardship Program, WRD has developed and published a descriptive handbook of Georgia's 103 protected plant species that include 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 water body 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 Water body 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 committee 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 stream banks, 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 Flint River Basin, including Clayton County. Appendix F provides a list of Georgia Adopt-A-Stream volunteer groups in the Flint River Basin.

With the program's outreach activities, nonpoint source pollution 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 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 Groundwater 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 groundwater contamination and the need for groundwater 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 sludges,
- 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. EPD also administers 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 groundwater 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 Flint 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 subbasin 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 subbasin 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 subbasins will be required to help to restore and maintain the water quality throughout the Flint 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 Upper Flint Basin (HUC 03130005)

The upper Flint basin is the most populated subbasin in the Flint River system, containing Hartsfield International Airport and supporting increased suburban development from southern metropolitan Atlanta. While seventy-one percent of the streams sampled supported their designated uses, twenty-nine percent either partially or did not support the designated use. The concerns identified may indicate an actual exceedance of water quality standards or

indicate the need for further monitoring to ensure that the water quality / quantity is not threatened in the future.

The concerns identified for portions of this subbasin include metals concentrations, concentrations of PCBs, chlordane, or mercury in fish tissue, elevated fecal coliform bacteria concentrations, low dissolved oxygen concentrations, sedimentation, and water supply / flow needs.

Issue A. Metals

Problem Statement: The water use classification of fishing was not fully supported in 6 stream segments due to exceedances of water quality standards for metals (lead, zinc, and copper). One station had zinc violations, two stations between Hartsfield International Airport and Flat Shoals had lead violations due to urban runoff, three monitored tributaries draining the metropolitan Atlanta area of the subbasin had violations of standards for lead, and one of these had additional standard violations for copper and zinc.

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. An areawide stormwater permit was issued on 6/15/94. 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.

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: 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 the issuing authority erosion and sedimentation control enforcement, zoning and land use planning, local watershed initiatives, and monitoring programs.
- *Citizen groups*: Adopt-A-Stream program 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: 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.
- 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.

Issue B. Fish Consumption Guidelines

Problem Statement: The water use classification of fishing was not fully supported in the Flint River mainstem (in Spalding / Fayette counties and Meriwether / Pike / Upson counties) based on

fish consumption guidelines due to mercury. The guidelines are for largemouth bass and shoal bass, respectively.

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 Flint River and issued fish consumption guidelines. There are no known point source discharges of mercury into the Flint River Basin.

Identified Gaps and Needs: The source of mercury is believed to originate from atmospheric sources.

Strategies: 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 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.

Issue C. Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in 16 segments due to exceedances of the water quality standard for fecal coliform bacteria. Twelve monitored tributaries had violations of the standard for fecal coliform bacteria in urban areas (Atlanta, Griffin, Thomaston). These may be attributed to a combination of urban runoff, septic systems, sanitary sewer overflows, and rural nonpoint sources. An additional tributary near Greenville had violations of the fecal coliform standards due to a municipal discharge that has since been eliminated.

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

Ongoing Efforts: The principal source of exceedances of water quality standards for fecal coliform bacteria in the upper Flint is urban nonpoint source runoff. Septic tanks and sanitary sewer overflows may also contribute to the problem. The major point source discharges in this area were eliminated in the 1980's with the implementation of the Three Rivers Water Quality Management Program. In addition, EPD issued a Consent Order to the City of Greenville requiring the City to eliminate an unpermitted raw sewage discharge form the City's sewage system. Greenville has eliminated the discharge.

In general, urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94. 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 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.

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, coliform 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 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: 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, stormwater programs, zoning and land use planning, local watershed initiatives, and monitoring programs.
- *Chattahoochee-Flint RDC:* coordinate regional stormwater planning.
- *Municipalities*: work with the local health departments to identify locations of septic systems and educate owners about the proper care and maintenance of septic systems.
- *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 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.
- 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.
- ARC will develop a draft water quality management plan for the Atlanta metro area in FY 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 Flint 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 form 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 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 Flint River Basin in 2001.

Issue D. Dissolved Oxygen

Problem Statement: The water use classification of fishing was not fully supported in 7 stream segments due to dissolved oxygen concentrations below water quality standards. Oxygen demand in urban runoff from metropolitan Atlanta and treated wastewater discharges from the Griffin-Cabin Creek WPCP contributed to reduced dissolved oxygen levels. Dissolved oxygen violations were also found in Flat Creek, Camp Creek and Beaver Creek, due to nonpoint sources.

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

Ongoing Efforts: EPD will conduct a model calibration study of Cabin Creek to determine DO concentrations for the Griffin-Cabin Creek WPCP discharge.

In general, urban runoff is being addressed in the EPD Stormwater Management Strategy for metropolitan Atlanta. An areawide stormwater permit was issued on 6/15/94. 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 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.

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: The types of nonpoint source inputs causing the low dissolved oxygen readings at Flat Creek, Camp Creek and Beaver Creek, need to be identified to determine control strategies for these areas.

Strategies: 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, low dissolved oxygen concentrations, fecal coliform bacteria, nutrients, and habitat degradation.

Key Participants and Roles:

- *EPD:* monitor and assess use support in listed waters; regulate point sources under the NPDES program; 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 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 continue to ensure that all permitted point sources remain in compliance with permitted effluent limitations for dissolved oxygen. 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 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 encourage involvement of citizen groups through the Adopt-A-Stream program to address restoration of urban streams.
- 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: Progress in management of urban stormwater will be tracked through annual reporting required by municipal stormwater permits. A reevaluation of the status of listed waterbodies will be made coincident with the next iteration of the RBMP management cycle for the Flint River Basin in 2001.

Issue E. Erosion and Sedimentation

Problem Statement: The water use classifications of fishing and drinking water are 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 15 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: 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 compliance survey for forestry BMPs on 3,517 acres in this subbasin and determined that eighty-two percent of the activities were in compliance: roads 79%; harvesting 81%; and site preparation 99%.

The Urban Resources Partnership addresses urban natural resource and environmental issues in the Atlanta metropolitan area. Several stream restoration projects are underway as part of this grant program.

Identified Gaps and Needs: Habitat degradation due to erosion and sedimentation is thought to be a primary contributor to biological impairment in metropolitan Atlanta streams, but requires further study. 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.

Unpaved 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: 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:* encourage the use of urban best management practices and coordinate the stormwater strategy.
- *Local governments:* enforce erosion controls for construction practices and implement land use planning.
- *GSSWC*: encourage the implementation of BMPs to control erosion of agricultural lands.
- *GFC*: continue to monitor and encourage the 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.
- ARC will develop a draft regional water quality plan for the Atlanta metro area by FFY 1999.
- ARC will provide base loading estimates and BMP guidelines on projections in the regional water quality plan (ongoing after FFY 1999).
- The basin team will re-evaluate listed stream status and management strategies during the next basin cycle, scheduled for 2001.

- Local governments which are 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 Flint River Basin in 2001.

Issue F. Water Supply/Flows

Problem Statement: Water supply to meet municipal water supply needs is threatened due to growth pressures in the subbasin.

General Goals: Maintain instream flows to support drinking water uses, while protecting Flint River instream flow conditions.

Ongoing Efforts: Water quantity needs and allocations throughout the entire basin are being addressed as part of the mulit-agency Alabama-Coosa-Tallapoosa / Apalachicola-Chattahoochee-Flint (ACT / ACF) study.

Strategies: Water conservation strategies should be implemented to extend water supplies.

Issue G. Flooding

Problem Statement: Flooding in the Flint River Basin threatens people and property located within the floodplain, as demonstrated during the massive floods of 1994. Flooding may also breach dams, and can contaminate drinking water wells located within the floodplain.

General Goals: Increase awareness and knowledge of floodplain management. Assist communities participating in the National Flood Insurance Program (NFIP) to maintain compliance with NFIP regulations.

Ongoing Efforts: EPD will continue to provide workshops, and technical assistance and data to participating communities and other parties involved in floodplain determinations. In addition, floodplain management information and updates on available technical resources will continue to be disseminated via quarterly newsletters and the Internet.

Identified Gaps and Needs: Recently produced Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) of communities in the Flint River Basin lack specific Base Flood Elevation (BFE) data within the Special Flood Hazard Areas. The absence of BFE data requires communities to use arbitrary above natural ground lowest floor elevation requirements for new construction (less than 50 lots and / or 5 acres) and substantial improvements of existing structures.

Strategies: Develop "action partnerships" with agencies and organizations such as Regional Development Centers (RDCs), Georgia Municipal Association and Association County

Commissioners of Georgia to maintain compliance and increase the number of NFIP communities within the basin. Agencies such as the Natural Resources Conservation Service and U.S. Army Corps of Engineers are potential resources for technical data and information.

7.2.2 Middle Flint Basin (HUC 03130006 and 03130007)

The concerns identified for portions of this subbasin include metals concentrations, elevated fecal coliform bacteria concentrations, low dissolved oxygen concentrations, sedimentation, and water supply/flow needs.

Issue A. Metals

Problem Statement: The water use classification of fishing was not fully supported in 13 stream segments due to exceedances of water quality standards for metals (lead, zinc, and copper) from nonpoint sources. The water use classification of recreation was not supported in a portion of Lake Blackshear due to metals (lead, nickel, zinc, and copper) from urban runoff and other nonpoint sources. A portion of the City of Cordele lies in the Gum Creek watershed, which drains to Lake Blackshear.

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

Ongoing Efforts: EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study of Lake Blackshear.

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. 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: 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 and encourage local efforts to address nonpoint sources of pollution.

- *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 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 waters 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 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 listed stream status and management strategies during the next basin cycle, scheduled for 2001.

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 Flint River Basin in 2001.

Issue B. Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in 9 segments due to exceedances of the water quality standard for fecal coliform bacteria due to nonpoint sources. There is a large dairy operation in this subbasin which may contribute to the presence of fecal coliform bacteria. Land applications of sludge may also be a source of fecal coliform bacteria due to the karst topography in the region. The water use classification of recreation was not supported in a portion of Lake Blackshear due to elevated fecal coliform bacteria from urban and nonpoint sources. A portion of the City of Cordele lies in the Gum Creek watershed, which drains to Lake Blackshear.

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

Ongoing Efforts: EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study.

Identified Gaps and Needs: Sources of fecal coliform bacteria in many stream segments are not clearly defined. In some cases, coliform 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: 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, 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 Flint 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 form NRCS: promote implementation of agricultural management practices.
- *County and municipal governments*: septic system regulation, 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 Flint River Basin in 2001.

Issue C. Dissolved Oxygen

Problem Statement: The fishing water use classification was not fully supported in one stream due to dissolved oxygen concentrations less than the water quality standard due to nonpoint sources.

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

Identified Gaps and Needs: The sources of oxygen-demanding wastes need to be identified before control strategies can be developed.

Strategies: Ensure that permit limits are being met for municipal and industrial discharges and implement additional nonpoint source controls to reduce the amount of oxygen-demanding waste entering the listed waterbody.

Issue D. 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 (976 acres) in HUC 03130006 and documented 90% compliance: roads, 82%; harvesting, 90%. Survey on 5 sites (765 acres) in HUC 03130007 rated 95% compliance: roads, 72%; harvesting, 96%; and site preparation, 95%.

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 provde 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: 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:* encourage the implementation of BMPs to control erosion of agricultural lands.
- *GFC:* continue to monitor and encourage the 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 qualilty 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 E. Water Supply/Flow

Problem Statement: Water supply for drinking water and agricultural uses is potentially impaired in the middle Flint due to the depletion of groundwater supplies. Large quantities of groundwater are withdrawn from the Floridan Aquifer for irrigation during dry periods of the growing season to support agricultural production in the middle Flint basin. The Floridan Aquifer is interconnected with the Flint River; therefore, as these agricultural withdrawals increase, the flow of the Flint River during dry periods gets progressively smaller, possibly leading to deleterious instream flow conditions. In addition, since no new municipal, industrial, or agricultural withdrawals of groundwater can be made from the Clayton Aquifer, a deeper aquifer in the Dougherty Plain which is not connected with surface streams, future expansions of irrigation pumping are likely to come from the Floridan, thereby possibly exacerbating the surface water effects.

General Goals: Meet the growing irrigation needs of Georgia's agricultural economy in the middle Flint River Basin, while protecting Flint River instream flow conditions.

Ongoing Efforts: Water quantity needs, including those of agriculture, are being addressed throughout the Flint basin as part of the ACT/ACF Study. A water allocation formula must now be developed which covers the Flint basin and meets Georgia's water needs in the region while addressing the issue of downstream and instream water quantity and quality concerns.

Identified Gaps and Needs: Agricultural water users in Georgia are not required to provide data on their annual or seasonal water use (under permits issued by the Georgia Environmental Protection Division). Development of a workable water management strategy for southwest Georgia must eventually address the collection and evaluation of actual agricultural water uses.

Strategies: After the adoption of a water allocation formula which covers the Flint River Basin, EPD must work with stakeholders from the region to develop a water management plan that, when implemented, meets the agricultural irrigation (and other) needs of the region, while not violating provisions of the allocation formula.

Issue F. Flooding

Problem Statement: Flooding in the Flint River Basin threatens people and property located within the floodplain, as demonstrated during the massive floods of 1994. Flooding may also breach dams, and can contaminate drinking water wells located within the floodplain.

General Goals: Increase awareness and knowledge of floodplain management. Assist communities participating in the National Flood Insurance Program (NFIP) to maintain compliance with NFIP regulations.

Ongoing Efforts: EPD will continue to provide workshops, and technical assistance and data to participating communities and other parties involved in floodplain determinations. In addition, floodplain management information and updates on available technical resources will continue to be disseminated via quarterly newsletters and the Internet.

Identified Gaps and Needs: Recently produced Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) of communities in the Flint River Basin lack specific Base Flood Elevation (BFE) data within the Special Flood Hazard Areas. The absence of BFE data requires communities to use arbitrary above natural ground lowest floor elevation

requirements for new construction (less than 50 lots and/or 5 acres) and substantial improvements of existing structures.

Strategies: Develop "action partnerships" with agencies and organizations such as Regional Development Centers (RDCs), Georgia Municipal Association and Association County Commissioners of Georgia to maintain compliance and increase the number of NFIP communities within the basin. Agencies such as the Natural Resources Conservation Service and U.S. Army Corps of Engineers are potential resources for technical data and information.

Issue G. Nutrients

Problem Statement: The water use classifications of fishing and recreation are potentially threatened in Lakes Blackshear and Worth due to inputs of nutrients which may cause excess algal growth in the lakes. A source of nutrients may be agricultural runoff, since a primary land use surrounding Lake Blackshear is agricultural production of row-crops. Other sources may include municipal and industrial water pollution control plants discharging in the watershed.

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

Ongoing Efforts: EPD is conducting a Clean Lakes Phase I Diagnostic/Feasibility Study the results of which will be used to develop specific lake water quality standards for Lake Blackshear.

Identified Gaps and Needs: The Clean Lake Study will provide information on nutrient concentrations and sources.

Strategies: Additional point and nonpoint source controls such as agricultural best management practices may be implemented in the watersheds surrounding Lakes Blackshear and Worth to minimize nutrient inputs into the lakes and comply with future water quality standards.

Issue H. Nuisance Weeds

Problem Statement: The water use classifications of fishing and recreation are potentially threatened in Lakes Blackshear and Worth due to the presence of nuisance aquatic plant species.

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

Ongoing Efforts: The Georgia Power Company and Crisp County Power Commission participate as a cooperator with the Georgia Wildlife Resources Division in a nuisance aquatic plant control program. Ongoing control programs include herbicide applications and biological control methods, including the introduction of more desirable, competitive aquatic vegetation.

Identified Gaps and Needs: Work should be done periodically by the power companies to inventory aquatic weed populations in the lake.

Strategies: Georgia Power, Crisp County Power Commission, and WRD should continue the control program for aquatic weeds.

7.2.3 Lower Flint Basin (HUC 03130008, 03130009, and 03130010)

The concerns identified for portions of this subbasin include metals concentrations, elevated fecal coliform bacteria concentrations, nutrients, sedimentation, and water supply/flow needs.

Issue A. Metals

Problem Statement: The water use classification of fishing was not fully supported in 3 stream segments due to exceedances of water quality standards for metals (lead and zinc) as a result of urban runoff from the City of Albany.

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. 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: 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 and encourage local efforts to address nonpoint sources of pollution.
- *Local governments*: stormwater management strategies, where the issuing authority erosion and sedimentation control enforcement, zoning and land use planning, and 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 for listed waters 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 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: 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 Flint River Basin in 2001.

Issue B. Fecal Coliform Bacteria

Problem Statement: The water use classification of fishing was not fully supported in 10 stream segments due to exceedances of the water quality standard for fecal coliform bacteria. These violations may be attributed to CSOs in the City of Albany and other sources of urban runoff.

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

Ongoing Efforts: The City of Albany has developed a CSO strategy that is expected to be fully operational in 1998.

Identified Gaps and Needs: Sources of fecal coliforms in many stream segments are not clearly defined. In some cases, coliforms 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: 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; 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, 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 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 Flint River Basin in 2001.

Rural Areas:

Key Participants and Roles:

- *EPD:* monitor and assess use support in listed streams, ecourage local planning efforts, regulate point sources under the NPDES program.
- *GSWCC* and local SWCDs and RC&D councils with assistance form NRCS: promote implementation of agricultural management practices.
- *County and municipal governments:* septic system regulations 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 Flint River Basin in 2001.

Issue C. Nitrates in Groundwater

Problem Statement: Drinking water use is potentially threatened in the lower Flint due to the presence of nitrates in groundwater supplies in some of the Coastal Plain aquifers. In the southwest portion of the City of Albany, near the Albany Airport, a survey of nitrates in 221

shallow wells has indicated an elevated nitrate level in the groundwater. Nitrates can come from nonpoint sources such as natural and artificial fertilizer, feedlots, and animal enclosures. Septic tanks and land application of treated wastewater and sludge are other potential sources of nitrate.

General Goals: Meet applicable water quality standards, ensure water quality protective of aquatic life and human health for drinking water.

Ongoing Efforts: EPD monitors ambient groundwater quality through the Georgia Groundwater Monitoring Network. Approximately 133 wells are sampled annually. EPD has been working with the Department of Agriculture to sample a network of special monitoring wells located downgradient from concentrations of agricultural fields to monitor for pesticides in groundwater.

The EPD in cooperation with the Dougherty County Health Department, the Georgia Department of Agriculture, and the University of Georgia Extension Service conducted studies in 1997 in the southwest portion of the City of Albany near the Albany Airport which determined the lateral extent of the nitrate plume and the property from which the nitrate originated. The Dougherty County Health Department advised home owners with wells in the affected area of the need to secure an alternative source of drinking water. The study partners are continuing the monitoring program in the area to assess the movement of the plume and are working together to develop appropriate strategies for addressing the existing problem. EPD will install sentinel wells in 1998 to monitor for plume movement.

Identified Gaps and Needs: None identified.

Strategies: Site specific nonpoint source control strategies may be needed to manage fertilizer application in the lower Flint.

Issue D. Erosion/Sedimentation

Problem Statement: The water use classifications of fishing and recreation are potentially threatened in many segments 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.

GCF conducted a BMP compliance survey in 1992 on 23 sites (4,475 acres) and documented 97% compliance: roads, 95%; and harvesting, 97%.

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 provde 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: 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 will enforce erosion controls for construction practices and land use planning.
- *GSSWC:* encourage the implementation of BMPs to control erosion of agricultural lands.
- *GFC:* continue to monitor and encourage the 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 qualilty 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 E. Water Supply/Flow

Problem Statement: The water supply, drinking water use, and fisheries are potentially impaired in the lower Flint due to groundwater demand. Very large quantities of groundwater are withdrawn from the Floridan Aquifer for irrigation during dry periods of the growing season to support agricultural production in the upper Flint basin. The Floridan Aquifer is interconnected with the Flint River; therefore, as these agricultural withdrawals increase, the flow of the Flint River during dry periods gets progressively smaller, possibly leading to deleterious instream flow conditions. Also, the striped bass fisheries south of Albany are dependent on groundwater springs to provide cool water refuges during the summer months. In addition, since no new municipal, industrial, or agricultural withdrawals of groundwater can be made from the Clayton Aquifer, a deeper aquifer in the Dougherty Plain which is not connected with surface streams, future expansions of irrigation pumping are likely to come from the Floridan, thereby possibly exacerbating the surface water effects.

General Goals: Meet the growing irrigation needs of Georgia's agricultural economy in the upper Flint basin, while protecting Flint River instream flow conditions.

Ongoing Efforts: Water quantity needs, including those of agriculture, are being addressed throughout the Flint basin as part of the ACT/ACF Study. A water allocation formula must now be developed which covers the Flint basin and meets Georgia's water needs in the region while addressing the issue of downstream and instream water quantity and quality concerns.

Identified Gaps and Needs: Agricultural water users in Georgia are not required to provide data on their annual or seasonal water use (under permits issued by the Georgia Environmental Protection Division). Development of a workable water management strategy for southwest Georgia must eventually address the collection and evaluation of actual agricultural water uses.

Strategies: After the adoption of a water allocation formula which covers the Flint River Basin, EPD must work with stakeholders from the region to develop a water management plan that, when implemented, meets the agricultural irrigation (and other) needs of the region, while not violating provisions of the allocation formula.

Flooding

Problem Statement: Flooding in the Flint River Basin threatens people and property located within the floodplain, as demonstrated during the massive floods of 1994. Flooding may also breach dams, and can contaminate drinking water wells located within the floodplain.

General Goals: Increase awareness and knowledge of floodplain management. Assist communities participating in the National Flood Insurance Program (NFIP) to maintain compliance with NFIP regulations.

Ongoing Efforts: EPD will continue to provide workshops, and technical assistance and data to participating communities and other parties involved in floodplain determinations. In addition, floodplain management information and updates on available technical resources will continue to be disseminated via quarterly newsletters and the Internet.

Identified Gaps and Needs: Recently produced Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) of communities in the Flint River Basin lack specific Base Flood Elevation (BFE) data within the Special Flood Hazard Areas. The absence of BFE data requires communities to use arbitrary above natural ground lowest floor elevation requirements for new construction (less than 50 lots and / or 5 acres) and substantial improvements of existing structures.

Strategies: Develop "action partnerships" with agencies and organizations such as Regional Development Centers (RDCs), Georgia Municipal Association and Association County Commissioners of Georgia to maintain compliance and increase the number of NFIP communities within the basin. Agencies such as the Natural Resources Conservation Service and U.S. Army Corps of Engineers are potential resources for technical data and information.

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