

APALACHICOLA RIVER AND BAY MANAGEMENT PLAN

Developed by
the Northwest Florida Water Management District
under the auspices of
the Surface Water Improvement and Management (SWIM) Program
in cooperation with
the Florida Department of Environmental Protection
and the Apalachicola SWIM Technical Advisory Committee

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I. INTRODUCTION

The Apalachicola River and Bay Management Plan is a product of the Apalachicola River and Bay Surface Water Improvement and Management (SWIM) Program. The plan is intended to provide a comprehensive basinwide strategy for management of the water resources in the Apalachicola Ecosystem by the State of Florida. A basinwide approach is particularly problematic and complex due to the interstate nature of the entire system which includes portions of Alabama and Georgia. The SWIM program has, to date, provided the coordination to implement the plan.

At heart, ecosystem management is good stewardship. Stewardship, as an idea, carries with it a strong sense of ownership in, and responsibility for, Florida's lands and resources.

DEP Publication, 1996

During 1993, the Florida Legislature reorganized the Florida Department of Natural Resources (FDNR) and The Florida Department of Environmental Regulation into the Florida Department of Environmental Protection (FDEP). The Legislature further enacted a law that stated that the new policy of FDEP was to implement the emerging concept of Ecosystems Management. This new department strategy seeks to protect the functions of entire ecological systems through enhanced coordination of public land acquisition, regulatory, and planning programs.

The FDEP definition of Ecosystem Management is: Ecosystem Management is an integrated, flexible approach to management of Florida's biological and physical environments – conducted through the use of tools such as planning, land acquisition, environmental education, regulation, and pollution prevention – designed to maintain, protect and improve the state's natural, managed, and human communities.

The Department's definition of an Ecosystem is: A community of organisms, including humans, interacting with one another and the environment in which they live.

While the implementation of this new philosophy is in its infancy within the Department, many of the overall concepts and strategies have been part of the Apalachicola River and Bay SWIM program for the life of its SWIM designation. The Apalachicola River and Bay Ecosystem was one of two initial ecosystems designated by the Department as a pilot program to explore Environmental Indicators as a process to track the performance of Ecosystem Management. Environmental Indicators are defined as a model process to provide a performance structure that provides consistent, comparable products and results. An example of indicators related to the Apalachicola River and Bay Ecosystem would be the change in shellfish harvesting from year to year or the change in mean densities of alligators per mile from year to year.

Many of the current and completed SWIM projects will be helpful in acquiring the data, analysis, and general planning information needed to implement Ecosystem Management and track its progress through Environmental Indicators. How the Ecosystem Management program and the SWIM program will interrelate in the future will be determined over the next few years.

The Four Cornerstones of Ecosystem Management, as defined by the Department are:

- I. Placed-based Management - focus on particular areas.
- II. Common Sense Regulation - encourages incentives, voluntary participation, and shared responsibilities.
- III. Cultural Change - inclusion of private landowners and regulated public.
- IV. Improved Foundations for Ecosystem Management - improved science, technology, planning, and environmental education.

The Apalachicola River and Bay Swim program, since its inception, has included these same Ecosystem Management concepts in its planning efforts as well as the development of goals and projects.

This SWIM plan begins with a description of the Apalachicola basin and the issues surrounding the management of this resource. Following that, the plan revisits the interstate issues that involve Florida's watershed partners; Alabama and Georgia. This discussion includes an explanation of the Apalachicola-Chattahoochee-Flint (ACF) Comprehensive Study and the Apalachicola Freshwater Needs Study. The next section of this plan focuses on SWIM's role in this complex set of issues.

II. BASIN DESCRIPTION

Apalachicola River and Bay Basin Statistics:

- 173 square miles of forested floodplain
- 21,794 square miles drained by the ACF Basin
- The Apalachicola River is 1st in magnitude of flow volume in Florida, 5th entering the Gulf of Mexico, and 21st in the nation
- The Apalachicola River discharges an average of approximately 22,400 cfs at the Florida stateline
- The ACF Basin is home to 86 fish, 315 bird species, and 52 mammalian species

In order to properly manage and protect the resources of the Apalachicola River and Bay, it is essential to have an understanding of the physical and biological resources of the system and how they function and interact with each other. Appendices B and C provide a detailed physical and biological description; an introduction to the physical and biological aspects of the basin follows.

The entire Apalachicola drainage basin (Figure 1) is comprised of the Apalachicola, Chattahoochee, and Flint River basins and Apalachicola Bay watershed, hereinafter referred to as the ACF Basin. The ACF Basin, when viewed as a whole with all of its natural resources, is one of the southeastern United State's most diverse, productive and economically important natural systems. The FDEP has defined the Greater Apalachicola Ecosystem Management Area within Florida to include the Chattahoochee, Chipola, Apalachicola, and New rivers and their major receiving waterbody, Apalachicola Bay. This is essentially the same area included under the SWIM designation.

The biology of the Apalachicola-Chattahoochee-Flint (ACF) Basin is unique because of its origin in the southern Appalachian Mountains and the adjacent Piedmont resulting in a diverse physical environment (Leitman

et al, 1984). The forested floodplain of the Apalachicola River is the largest in Florida and covers

approximately 173 square miles of floodplain (Barkuloo et al, 1987). The ACF Basin drains 21,794 square miles of lands within

FIGURE 1 Apalachicola Drainage Basin

FIGURE 1 Apalachicola Drainage Basin

Alabama, Georgia and Florida. The river is 21st in magnitude of flow volume among the rivers in the coterminous United States, the 5th largest entering the Gulf of Mexico, and the largest in Florida. As the hydrologic regime and water quality of the Chattahoochee and Flint rivers define the physical and biological characteristics of the Apalachicola River, so does the Apalachicola River play a key role in defining the salinity regime and ecology of the Apalachicola Bay. The bay in turn affects aspects of the Gulf ecology.

The riverbed decreases 40 feet in elevation from the Florida state line in its course to the bay. The floodplain broadens downstream from one mile wide at just below Lake Seminole to over five miles near the mouth of the river (Matraw and Elder 1980). Each winter and spring the river floods into the adjacent wetlands of forested floodplain. The Apalachicola River is one of four alluvial rivers in the panhandle of Florida. Alluvial rivers have broad floodplains dominated by a variable seasonal flow, substantial annual flooding, and a heavy sediment load. The continual scouring action of water in the channel, combined with depositional processes, continually alter the stream channel, even during low flows. The deposition and erosion of material in the river eventually creates meanders which widen the river valley, decrease slope, slow down water velocity, and deposits more sediments, thereby continuing river channel alteration within the floodplain (Edmiston and Tuck 1987). The Apalachicola River lies entirely within the lower Coastal Plain Physiographic Province and is the only river in Florida with headwaters in the southern Appalachians (Barkuloo et al, 1987).

Human society's dependence upon natural systems is clear. We need plants to capture sunlight and to provide food, building materials, and energy. We need breathable air, potable water, and arable soils. We need our waste products recycled. These and other ecosystem services are essential to human life, and they are often provided with minimal or no human intervention.

John Cairns Jr., 1995

(McNulty et al, 1972).

Apalachicola Bay, from an ecosystem perspective, is dependent upon fresh water, nutrients, detritus and sediments which are delivered downstream and maintain a complex system of interrelated physical and biological activities in the lower river and bay. The estuary has evolved into the existing hydrologic system over thousands of years. The mean annual discharge of the river at Chattahoochee, Florida is 22,400 cubic feet per second (cfs), while the mean annual discharge at the Sumatra gage is 25,000 cfs (Leitman et al, 1984). The width of the river at mean discharge ranges from 250 to 1,000 feet. The summer and fall are characterized by low flows, and highest flows occur in the winter and spring. Seasonal river stage fluctuations are three times greater in the upper river than in the lower, and peak floods are most likely to occur during January through April (Leitman et al, 1983). Over a typical year, daily flow can vary tenfold. Flows are directly related to river elevations which determine the timing and extent of floodplain inundation. It is estimated that the Apalachicola discharge to the Gulf accounts for 35 percent of the total freshwater contribution from the west coast of Florida

The Apalachicola Bay estuary covers an area of about 212 square miles and serves as the interface between uplands and the Gulf of Mexico. The bay is bounded by four barrier islands: St. Vincent Island, St. George Island, Cape St. George Island, and Dog Island. Salinity stratification in Apalachicola Bay has been documented as

covering the entire range of estuarine classifications, from highly stratified to well mixed. The bay has a different geometry than the majority of river influenced estuarine systems along the Gulf coast in that the long axis of the bay is perpendicular to the direction of the major inflow point of the river.

The effect of bay geometry is that the flow from the river enters the estuary at a right angle to the general flow direction of tidal currents. This is suspected to cause a greater degree of turbulence and subsequent mixing of fresh and salt water. Tidal influence occurs through breaks in the barrier islands. Winds may also be uncharacteristic because the longest fetch is cross-stream to the river flow. Generally, the estuary is slightly stratified with a horizontal salinity gradient. Daily fluctuations in some areas range as high as 30 ppt (Weisberg 1989). Vertical salinity variation has been as high as 16 ppt in a 3 m water column. These characteristics of the bay and the river affect the circulation patterns of the bay which support a highly productive estuary.

The Apalachicola Ecosystem includes a wide diversity of habitats and has the highest species density of amphibians and reptiles in North America, north of Mexico (Leitman et al, 1984). The Apalachicola River basin also supports the greatest number of freshwater fish species (86) in Florida. The river drainage basin supports many mammal species. Means (1977) identified 52 mammalian species which inhabit the floodplain and upland areas within the basin. The floodplain forests of the Apalachicola River is composed of bottomland hardwoods and Cypress/Tupelo. The river banks of the upper river are often characterized by steep bluffs reaching heights of 150 feet.

Apalachicola Bay is one of the most beautiful and productive estuaries in the nation. This is God's country.

Woody Miley, at least once a week

In general, the water quality in the Apalachicola River is good when compared with other major river systems in the region (Leitman et al, 1984). The primary reasons for the relatively high water quality within the basin are the undeveloped nature of the basin, the retention of pollutants in upstream reservoirs acting as settling ponds, and the sedimentary nature of the river bottom.

Over 90% of all commercial and recreational species in the Gulf are estuarine dependent. The overall high water quality of Apalachicola Bay, with the combined effects of seasonal flooding, nutrient and detrital transport, and the variable salinity regime, provide ideal living conditions for estuarine biota and result in a highly productive system. The bay system is comparable to other Gulf estuaries in nutrient and detrital transport and cycling from the attendant river and floodplain, and in phytoplankton productivity (Estabrook 1973; Elder and Mattraw 1982). It is also comparable to other Gulf estuaries in zooplankton production (Edmiston 1979) and bay anchovy abundance (Sheridan and Livingston 1983). For many years the bay has supported the largest oyster harvesting industry in Florida, as well as extensive shrimping and commercial fishing. Salinity is the major environmental parameter affecting species composition in the estuary, and the Apalachicola River is the primary source of fresh water to the estuary. Many Gulf species have high

salinity requirements and, although they may enter the bay to feed, they cannot tolerate the rapid salinity fluctuations which may occur there.

III. FLORIDA ISSUES

The Apalachicola River and Bay are bounded by six counties: Jackson, Gadsden, Calhoun, Liberty, Franklin, and Gulf (Figure 2). The most populous county in the basin is Jackson, with an estimated 1993 population of 44,400 residents. Liberty County is the least populous with 5,700 residents (Pierce 1994). Within the basin there are eight municipalities which may directly impact the river and bay: Marianna, Wewahitchka, Blountstown, Bristol, Apalachicola, Chattahoochee, Sneads, and Carrabelle. The most populous of these is Marianna, with a 1993 estimated population of 6,249 residents, while the least populous is Bristol, with 959 residents (Pierce 1994).

The Apalachicola River system represents an anachronism in today's world of physically altered and often polluted major river systems. The high levels of biological productivity of the Apalachicola Basin provide a major source of income for an entire region.

Dr. Robert J. Livingston, 1992

The economic base within the Florida portion of the basin is closely linked to the natural systems within the Apalachicola River and Bay drainage basin. The most important uses include commercial fishing in both the river and bay, forestry, agriculture, and recreational activities such as hunting and fishing. Additionally, the coastal area is dependent upon tourism and attracts many new residents. The greatest development pressures occur in the coastal areas of the basin due to the influence of tourism and second home construction. However, population growth in the river basin is predominantly retirees and some businesses.

Recent estimates indicate that the forestry and fisheries "export" values within the basin are even more important than previous studies have revealed. The total value of fisheries in the basin exceeds \$23 million (Barkuloo et al, 1987). The natural resources of the Apalachicola basin provide an important economic base for the local economy, and these same natural resources have a direct influence on the region through export and responding. Because the economic base in the basin is limited, the Apalachicola Valley Conference was sponsored by the Northwest Florida Water Management District (NFWMD) in early 1987 to review available options for expanding the economy while at the same time protecting the natural resources, in particular the fisheries. Options included better organization of the seafood industry; aquaculture; enhanced attraction of tourists; continued and expanded development of a historical district in the City of Apalachicola; and taking a basinwide approach to economic diversification (FDNR 1988a draft).

In addition to commercial value, the river and bay provide valuable game and nongame wildlife habitat, including nesting habitat for bald eagles, osprey, wading birds, and shorebirds. The Apalachicola estuarine system is recognized as one of the most productive at both the state and national level. Accordingly, this system has received numerous designations, including Florida Aquatic Preserve, National Estuarine Research Reserve and International Biosphere Preservation Area. In an effort to address environmental problems, a portion of

Franklin County was designated an Area of Critical State Concern during the early 1980s. Numerous rare, threatened and endangered species, as well as species of special concern, inhabit the Apalachicola River and floodplains (see Appendix C).

The Apalachicola River and Bay have experienced the least pollution and development when compared with other ecological systems in the southeast and possibly the United States. With the predominant economic base dependent on harvesting natural resources within the river basin and bay, it is evident that protection of the natural functions which sustain these resources is critical to the state. The existing point and nonpoint sources of pollution and associated land use are the primary cause for current and future impacts on the system. Appendix D provides discussion of point and nonpoint sources of pollution and impacts to the Apalachicola River and Bay. The Apalachicola River and Bay Drainage Basin: Preliminary Franklin County Land Use Assessment, Apalachicola River and Bay Drainage Basin: Franklin County Nonpoint Source Assessment, and Point Source Assessment of the Apalachicola River and Bay Drainage Basin are reports completed by the SWIM Program which define impacts in more detail associated with point and nonpoint sources of pollution.

With identification of sources complete, potential impacts from local sources of pollution can be defined and analyzed. The NFWFMD will work closely with local governments and appropriate state or federal agencies to establish actions, regulations and land use designations which will determine which uses in the basin will have the least impact on the natural functions of the river and bay.

IV. INTERSTATE ISSUES

The Alabama and Georgia portions of the basin (refer to Figure 1) comprise over 85% of the watershed. Water resource management in these states has the potential to significantly impact the timing, quantity, and quality of water reaching Florida. Upriver water uses include hydroelectricity, flood control, wastewater dilution, commercial and industrial water supply, irrigation, navigation, water supply, and recreation. The Chattahoochee River passes through 14 dams before reaching the state line. The Flint River has two control structures. Most of these dams (Table 1) have limited storage and have little influence on river flow, but four dams operated by the U.S. Army Corps of Engineers (COE) do have substantial storage capacity. The largest of these is Buford Dam below Lake Sidney Lanier, north of Atlanta, which holds over 60% of the storage capacity in the basin. Decisions relating to water demands and the timing of upstream water releases can significantly impact the health and ecology of the Apalachicola River and Bay. ACF management, from a basinwide perspective, was formally proposed by the Northwest Florida Water Management District in 1976. The proposal received little support. The issue was raised again in 1979 when the Apalachicola estuary was declared a

FIGURE 2 Apalachicola River and Bay

FIGURE 2 Apalachicola River and Bay

Table 1. Dams of the Apalachicola-Chattahoochee-Flint System and Authorized Uses

AUTHORIZED USE(S)
Flood control, navigation, hydropower, recreation, water supply
Hydropower, streamflow regulation
Flood control, hydropower, recreation, navigation, streamflow regulation, fish & wildlife development
Private dam for hydropower
Private dam for hydropower
Hydropower, water supply, recreation
Hydropower, recreation
Hydropower, water supply, navigation, recreation
Hydropower
Hydropower
Hydropower
Hydropower, recreation, navigation, fish & wildlife development
Navigation, recreation
Hydropower
Hydropower
Navigation, hydropower, recreation, streamflow regulation, fish & wildlife conservation

National Estuarine Sanctuary. Several conditions were made part of the agreement to this designation, including pursuit of funding for a basinwide management study. These conditions were also connected to the release of federal funds. As a result, the states of Florida, Georgia, and Alabama submitted a proposal to the U.S. Water Resources Council (WRC) for a Level B Study in the ACF Basin. Although in 1981 the WRC gave this proposal the highest priority among new projects, the abolition of the WRC by the Reagan Administration made this ranking meaningless (Leitman et al, 1989).

One of the primary issues of an interstate nature on the ACF River System concerns a commercial navigation channel nine feet deep by 100 feet wide in the upper Apalachicola River. Maintenance activities, including structural modifications to the river, deposition of dredged material in the floodplain and loss of riverine habitat have been the source of substantial controversy. The State of Florida maintains that channel and structural modifications are detrimental to the environment while providing little or no economic gain to its citizens. Specific problems associated with the navigational channels include:

- the burial of approximately 25 miles of riverbank habitat with dredge material and an associated decline of fisheries;
- the reduction of available spawning habitat for anadromous fish;
- the burial of floodplain wildlife habitat;
- channelization of the riverbed;
- changes in hydroperiod; and
- changes in nutrient transport to the estuary.

These activities can dramatically impact the natural functioning of the ecosystem. The 1986 Florida Game and Fresh Water Fish Commission Five Year Completion Report on Fisheries Ecology and Dredging Impacts on the Apalachicola River System documents impacts to the river from dredge disposal. The State of Florida attempts to ensure that management strategies do not adversely impact the ecosystem through a water quality certification permitting program. Negotiations over the maintenance of how the channel will be maintained led to discussion between the three states and the Corps with regard to development of management strategies and decision-making from a basinwide perspective. This approach recognizes and coordinates impacts of water allocations and management actions on other users in the system including not only the navigation project but also another primary concern for Florida, the quality, quantity and timing of freshwater delivery from upstream to the Apalachicola River and Bay. The need to address the complexities of the maintaining natural system functions while supplying human uses was again brought to the forefront.

The most pervasive impact on such rivers continues to be government-sanctioned and financed physical alterations that include damming, channelizing, diking, dredging, water diversion, and the removal of water for municipal and agricultural uses.

Dr. Robert J. Livingston, 1992

In 1982, the State of Florida opposed the relocation of rocks from the Apalachicola River navigation channel by the COE due to environmental concerns over water quality. This issue, aggravated by a record drought and subsequent closure of the channel, led to negotiations regarding the rock relocation. The State of Florida signed a Memorandum of Agreement (MOA) with the states of Georgia and Alabama and the COE which established an interim means of coordinating issues from a basinwide perspective and initiated a comprehensive basinwide water resources study ("308" Study).

In 1983, the COE, Florida, Georgia and Alabama began conducting the "308" Study for the ACF river system. Issues considered in this study included use and water supply trends and needs, interaction between ground and surface waters, management of waters during droughts, the freshwater needs of the Apalachicola Bay and the feasibility of an anadromous fish hatchery. Specific components of the study included a basinwide water assessment, a navigation maintenance plan, a drought management plan, and a water management strategy for the ACF basin. The study was scheduled to be completed in September of 1989. However, overdue study components and administrative problems prevented completion of some study elements, particularly a water budget and the formation of a long-term management mechanism. An extension to September 1996 has been agreed upon for all study components.

In 1990, the COE proposed to reallocate water in Lake Lanier from hydropower to municipal supply and to formalize current management practices at the federal reservoirs by adopting water control plans. Water control plans stipulate priorities for water use and allocation. Concerns over these proposals eventually resulted in a lawsuit by the State of Alabama in 1990 contending that the COE failed to meet the provisions of the National Environmental Policy Act in approving this reallocation. Florida entered the suit with Alabama, and Georgia entered the suit on the side of the Corps. Although the lawsuit cited unlawful procedural action, the reason for

the suit was inequitable allocations of water without consideration of the impacts on downstream users. Such altercations are common, particularly in basins whose boundaries are located in more than one state.

Acronyms

- COE - The Army Corps of Engineers
- TCG - Technical Coordinating Group
- ECC - Executive Coordinating Committee
- ACF - Apalachicola-Chatahoochee-Flint
- ACT - Apalachicola-Coosa-Tallapoosa
- MOA - Memorandum of Agreement

The lawsuit has been delayed to allow time for management issues to be better defined and to develop an alternative to management through litigation by establishing a formal negotiation process. A resolution calling for the establishment of a forum for discussion of water management issues and a comprehensive study of the water resource needs was signed by the governors of the three states and the USCOE. The forum features an Executive Coordinating Committee (ECC) consisting of appointees of the governors of Florida, Alabama and Georgia and the District Engineer from the Corps of Engineers, as well as a Technical Coordinating Group (TCG) to support the ECC. The ACF Comprehensive Water Resources Study (ACF Comp Study) is similar in nature to the old "308 Study" and consists of studies funded by the three states and the U.S. Congress through the Corps of Engineers.

Coordination of management actions between local, state, and federal government agencies is required to manage the ACF system from a basinwide perspective. Environmental, economic, and political issues should be considered if user needs are to be balanced with ecosystem functions. Once finite limits of the water resources are recognized and accepted by the public, allocating the available water within those limits becomes a political process. An attempt at this process is underway with the ACF Comprehensive Study, described in more detail below. Failure of this process to reach an equitable means of water allocation and management decisions would most likely result in a resumption of the lawsuit.

V. ACF COMPREHENSIVE STUDY

The primary objectives of the ECC were defined in a Memorandum of Agreement (MOA) signed by the governors and the COE in January 1992. Objectives included a commitment to cooperative management and development of regional water resources and development of a comprehensive basinwide study (ACF Comp Study) of those water supply regions. The TCG was tasked by the ECC to develop the ACF Comp Study in the ACF and Alabama-Coosa-Tallapoosa (ACT) River basins. The purpose of this comprehensive study is to determine the capabilities of the water resources, to describe the water resource demands of the basins, and to evaluate alternatives which benefit all user groups within the basins. The goal of the study is described below:

"Develop relevant technical information, strategies, and plans and recommend a formal coordination mechanism for the long-term, basinwide management and use of the water resources to meet the environmental, public health, and economic needs of the basins."

Total federal and state funding for this effort is in excess of \$16 million dollars. Critical portions of this effort include defining the freshwater needs of the Apalachicola River and Bay, developing tools to manage the basin as a system and defining an institutional means of implementing the recommendations of the study effort. The study is scheduled to be completed by September 1996 and is intended to include:

- a conceptual plan for water resource management of all water resources, including management of federal and non-federal impoundments and reservoirs in the ACF basin;
- an assessment of existing and future water resource needs, including the needs of human, economic, and natural systems within the ACF basin (Alabama, Florida, Georgia);
- the extent of water resources available within the basin to service such needs; and
- an appropriate mechanism(s) to implement the recommendations of the Comp Study. Once the governors and COE receive the ACF Comp Study, the options will be to commit to implementation of the recommendations or return to negotiation through litigation of water rights.

The SWIM program has played a lead role in the ACF Comp Study by integrating projects and staff time into the development of strategies, scopes of work, and negotiations. Florida's main contribution to the ACF Comprehensive Study has been development of the Apalachicola River and Bay Freshwater Needs Study, funded by the SWIM program and special legislative appropriations. This component of the ACF Comp Study and the SWIM program is an interdisciplinary group of studies designed to demonstrate the physical and biological relationships between freshwater flows and the natural productivity of the river and bay. This documentation of potential impacts to the ecosystem resulting from reduced or altered river flows will enable water managers to decide allocation issues with factual information. Responsible coordination with the intent to allow sustainable development, while protecting natural ecosystem functions, may be possible through these efforts. The political process to implement coordination is yet to be determined through the final leg of the ACF Comp Study.

VI. SWIM PROGRAM

The Surface Water Improvement and Management Act (SWIM) was passed by the Florida Legislature in 1987. It directed each water management district to design and implement plans and programs for the improvement and management of surface waters in cooperation with state agencies and local governments. Several concerns prompted passage of the SWIM Act. The Legislature found that many surface waters in the state have been degraded or were in danger of becoming degraded. Furthermore, natural systems associated with many surface waters have been altered so that they no longer perform important functions such as providing aesthetic and recreational pleasure, providing habitat for native plants, fish and wildlife, providing safe drinking water, attracting visitors and

accruing other economic benefits. Therefore, it is the intent of the Legislature and the SWIM Act to correct and prevent surface water problems through the development and implementation of SWIM plans in order to enhance the environmental and aesthetic value of surface waters so that the public may derive benefit and enjoyment from them.

The SWIM Act focuses on the following general areas of concern: 1) point and nonpoint sources of pollution; 2) destruction of natural systems; 3) correction and prevention of surface water problems; and 4) research for better management of surface waters and associated natural systems. Apalachicola River and Bay were designated the highest SWIM priority waterbodies in the northwest District. The Apalachicola River and Bay SWIM program attempts to address each of the previously discussed issues from the perspective of these four general concerns. The following summary of efforts, since 1987, describes the setting for the revision of the existing plan.

The SWIM program has been the primary funding source for the coordination and cooperation efforts revolving around the recent tri-state lawsuit. The program has also helped shape local land use and water quality management decisions as well as restoration efforts in the Apalachicola River Basin and Bay Watershed. Demonstration projects have been carried out using innovative management techniques designed to provide means for sustainable use of the resources. These included, but were not limited to, developing new methods for disposal techniques for dredged material and shoreline stabilization techniques, technical assistance and support for evaluating land acquisition efforts to provide buffers for surface waters from nonpoint source pollution, development of an oil spill response plan, and evaluation of water quality in the river and bay.

The SWIM plans for each priority waterbody is revised every three years. The first two editions of the Apalachicola SWIM plan have been dominated by interstate negotiations and complex interdisciplinary studies such as the Apalachicola River and Bay Freshwater Needs Study (described above under the ACF Comp Study). As these studies are completed over the next 18 months, the political negotiations over uses and priorities will take precedence. Public awareness of and involvement in the issues and negotiations will play a key role in the final determination of the fate of the quality of life and the natural systems in the largest and most unspoiled basin in Florida.

The planning process is viewed by many political interests as a hindrance to development so it becomes more acceptable to destroy a system and then restore it rather than to take effective steps to prevent resource losses in the first place.

Dr. Robert J. Livingston, 1991

Demonstration projects to restore historical hydrologic conditions have been effective in developing new management techniques to help restore or preserve the environment. The maintenance of the Apalachicola River navigation channel is the most evident issue in need of new direction if it is to be accomplished without significant degradation of the Apalachicola River. Disposal of dredged material is an old concern which must be addressed during the upcoming renewal of the permit. The SWIM program has worked towards innovative solutions by coordinating with the Disposal Site Restoration/Rejuvenation Demonstration Project to make use of the dredged material at a reasonable cost. Restoration of

tributary and slough connections will continue to be emphasized and coordinated with the COE and other federal and state agencies.

An ecologically-sensitive shoreline stabilization technique, developed under the SWIM program's Buffer Zone Project, is now being evaluated by the Apalachicola National Estuarine Research Reserve with EPA funding. The design costs no more than the traditional bulkhead construction but provides valuable habitat while offering protection from erosion to private landowners. An environmentally-acceptable alternative to shoreline hardening makes permitting more feasible and less costly. It reduces after the fact permitting of unauthorized structures and eases frustration with the permitting process.

Coordination and technical support for public land acquisition is one of the most effective ways the SWIM program can ensure sustainable management of natural resources. Natural vegetation buffers along streams, rivers and estuaries are one of the most practical and effective management tools available to protect water quality and aquatic habitat. The Buffer Zones Project not only initiated acquisition efforts in the Tates Hell area but has begun implementation of the Tates Hell Restoration Project utilizing SWIM program funds to match an EPA grant. Techniques developed for this demonstration project will be applicable to other areas in Tates Hell and throughout the southeast. Continuing prioritization, supporting land acquisition for buffer zones around surface waters, and funding programs to protect sensitive areas is critical to sustaining natural ecosystems.

Participation between the private sector and local government has been the key to SWIM program success. Innovative designs for shoreline stabilization will result in cost-effective and environmentally sensitive solutions with fewer permitting problems. Coordination among commercial barge operators, hazardous materials terminal facilities and local response organizations will lead to more effective responses to spills on the river and bay. Technical review and assistance to local governments regarding land use issues and water resources protection have helped protect surface waters by providing information regarding impacts of land use decisions. Nonpoint source assessments initiated with SWIM program funding have generated information that offers insight into cumulative impacts of existing and future land use scenarios.

Given the development and population pressures that will surely continue and increase, it is crucial that managers and citizens better understand the causes and effects of surface water degradation and ecosystem functions. This has been addressed by SWIM through several public awareness projects including school programs, expanding science courses and field trips through the ANERR, a conference on ACF issues, and establishing a Citizen Stewardship Program. The SWIM Public Awareness Program also works to inform citizens and local government officials of the findings of the research projects in terms that are meaningful to them in their day-to-day lives.

We need to look at ourselves as stewards of the river. The attitude we need for the river is "us over time." How does it work for everybody and how do we sustain it.

Steve Leitman, 1995

development of resources.

VII. SWIM PROGRAM GOALS, ISSUES, AND OBJECTIVES

The projected population increase in Florida for the year 2010 is substantial. The Apalachicola basin remains very attractive to settlement because of the currently uncrowded communities and beautiful, unspoiled rivers, streams, bays, and gulf beaches. Cooperation, coordination, and persistence have helped maintain the Apalachicola River and Bay in the condition in which it now exists. Continuing this approach with a comprehensive perspective provides the best opportunity for conserving and protecting this resource. This 1995 plan revision outlines specific project needs through 1998. This will mark 10 years of program implementation as we move toward sustainable

The SWIM program identified goals for the State of Florida in managing the Apalachicola River and Bay and defined issues in the river basin and bay watershed which were of primary concern to resource managers. Objectives were then established which would detail and quantify, when possible, how to reach the goals in relation to the defined issues.

Strategies, initiatives and specific projects are then developed to implement objectives and address the issues through a comprehensive and coordinated approach. The path to accomplishing objectives often requires research and data collection before management actions can be defined. A long-term perspective is often necessary when addressing issues; step-by-step scientific determinations to cause and effect is a critical part of solutions within the SWIM process; hence many projects may be of a research nature.

The Apalachicola River and Bay Management Plan, developed through the SWIM program, is designed to address water resource problems, issues, and strategies for management of the system as a whole. Through this plan, the SWIM program endeavors to establish and implement comprehensive basinwide management through both coordination of government interests and cooperation with private interests. This requires a regional approach to water quality and habitat issues. All levels of government within the basin have had an opportunity to participate through an interagency coordination committee which was also established as part of the SWIM program. Technical assistance will continue in developing local programs designed to protect the Apalachicola River and Bay from future degradation while at the same time allowing for sustainable use of resources associated with the natural systems.

From a planning perspective, the SWIM plan must be consistent with the State Comprehensive Plan and with state water policy. Similarly, Local Government Comprehensive Plans and site-specific management plans, such as the Apalachicola Aquatic Preserve Plan, should reflect the goals and objectives of the SWIM plan.

Goals

The primary goal of the State of Florida for the Apalachicola system is equitable management of the system to maintain and/or improve the natural resources of the Apalachicola River and Bay.

*Work is for people who
don't know how to fish.*

Bumber sticker, Decatur
County Georgia

As an integral component of that overall management perspective, the Apalachicola SWIM program's goal is the preservation of the natural system functions with as little disruption as possible and in a manner which maintains or improves water quality and aquatic habitat of the Apalachicola River and Bay.

Accomplishing both goals requires the establishment of a comprehensive basinwide management strategy that strives for sound, equitable management decisions based on factual information. Preservation and conservation are keys to maintaining the environmental integrity and quality of the system. The Apalachicola basin represents a unique and important natural ecosystem that has thus far experienced limited development. The SWIM program's major emphasis is to better understand and preserve that ecosystem.

Issues

The issues addressed in the plan are:

- I. The Apalachicola River and Bay have been altered so that the river and bay no longer provide all the historic natural benefits and functions they once did. Examples of some of the diminished natural and economic benefits are described below:
 1. Aesthetic and recreational opportunities for the public;
 2. Habitat for native flora and fauna, including endangered and threatened species;
 3. Adequate water quality and quantity in order to provide safe public water supply; and
 4. High biological productivity in the bay, including seafood production, tourist attraction, and accruing other economic benefits.
- II. Factors contributing to the decline in the ecological, aesthetic, recreational, and economic value of the river and bay are listed below:
 1. Point and nonpoint source pollution;
 2. Destruction of natural systems which provide treatment for surface waters and serve as habitats; and,
 3. Changes in quantity and timing of river flow.
- III. A better scientific understanding of the causes and effects of surface water degradation and of the destruction of natural systems is necessary in order to improve and manage surface waters and associated natural systems.

- IV. Local government cooperation and participation is vital to effective implementation of the necessary measures to protect, preserve, conserve and restore the functioning of the natural systems of the watershed. Public recognition and support of these necessary measures must be attained if solutions are to be long-term.
- V. Cooperation, coordination and funding are necessary from the state, the water management district, and local governments in addition to funds provided from the SWIM Trust Fund to implement a comprehensive management plan.

Objectives

The following objectives have been established to detail and quantify, when possible, how to reach the goals:

- I. Preservation of the existing natural system through conservation and protection of water quality and aquatic habitat, particularly unique or critical habitats. This effort should be accomplished through effective regulation of land and water uses, acquisition of appropriate lands, and the appropriate management of public and private lands.
- II. Prevent further degradation of the system from point sources, nonpoint sources, and predictable impacts associated with growth and increased utilization of the system, both commercially and recreationally. This objective specifically includes the development of pollution load reduction goals and recommendations for actions necessary to establish total maximum daily loads for pollutants in Outstanding Florida Waters as required by Chapter 62-40, F.A.C.
- III. Enhance scientific understanding of the system to better determine functions and needs for the development of appropriate long-term management strategies for the system.
- IV. Educate the public to help develop an understanding about the needs of the ecosystem, especially how local and individual actions impact the ecosystem.
- V. Promote and initiate coordination and cooperation between appropriate governmental agencies as well as the private sector regarding use of the system.

VIII. COMPREHENSIVE BASINWIDE MANAGEMENT STRATEGY

Six strategies and their accompanying initiatives have been developed for a basinwide management program based on the goals, issues, and objectives defined in the previous section of this document. These strategies were developed and will be implemented by District staff working in conjunction with a Technical Advisory Committee (TAC). The TAC is composed of federal, state, and local government representatives as well as those from private interests. Examples of private interests include the forest and seafood industries, environmental groups, and economic development organizations. To implement these strategic initiatives, specific project designs were incorporated from the previous plan and solicited from a variety of state and federal agencies and university staff. An outline of those strategies, initiatives and projects necessary to successfully implement a comprehensive basinwide management program follow.

It should be recognized that the resulting list of projects not be considered complete, comprehensive or totally integrated. Instead, the current list includes many research projects and reflects an attempt to fill a number of information gaps representing immediate needs, while acknowledging the requirement for long-term data and integration. Other projects involve restoration and educational activities designed to maintain or improve ecosystem functions and the public awareness of those functions.

The project list includes completed projects, on-going projects, and new projects. New projects may be proposed as new needs and issues arise, and incorporated into revisions of the plan. Results of many of the projects will be integrated directly into a comprehensive database to be used for management, planning, and decision-making.

Brief summaries of each proposed project are provided below. Detailed project descriptions are presented in Appendix A.

Plan Management and Administration Program Strategy

This program will administer the Apalachicola River and Bay SWIM Program and coordinate the comprehensive basinwide management strategy. Functions include: plan revisions, Technical Advisory Committee (TAC) meetings, funding acquisition, attendance at conferences (e.g., Gulf of Mexico Program, National Estuarine Program, American Water Resource Association), and project design, review, selection and coordination. The strategic initiatives and respective projects to be undertaken, at least in part through the SWIM program, are listed below:

Initiative 1: Provide regular periodic reports to the interagency management team and SWIM TAC.

Initiative 2: Identify other programs and plans affecting the basin through communication with appropriate staff.

Initiative 3: Seek and coordinate funding from appropriate sources to maximize effective use of management funds in the basin.

Project AP1 (Continuing Project) Administration, Planning, and Coordination Project - This project includes the implementation of a comprehensive program for the management of the Apalachicola River and Bay system. The program requires coordination of numerous programs and projects being implemented by the District and other entities. Administrative tasks, such as plan development and implementation, research coordination, pursuit of additional funding, technical advisory committee coordination, and plan updates all require significant staff commitment.

Basinwide
Management Strategy

You can't always get what you want, but if you try sometime, you just might find, you get what you need.

The Rolling Stones

This strategy involves coordination of planning, management, and study efforts throughout the entire basin including local, state, and federal governments. Solicitation of private sector cooperation, as well as public education and participation, is requisite to success. The strategic initiatives and respective projects to be undertaken, at least in part through the SWIM program, are listed below.

Initiative 1: Establish and implement agreements between appropriate federal agencies and the states of Alabama and Georgia for the management of interstate river basins. These agreements are necessary to prevent water quality degradation and maintain historic hydrology so that riverine and estuarine productivity and ecosystem integrity are sustained or improved.

Project BM1 (Continuing Project) Legal Strategies for Protecting the Water Resources of the Apalachicola River and Bay - This project will be designed to assess the legal rights and responsibilities of the states and the federal government regarding water rights. This effort will include identifying appropriate options for institutional changes.

Project BM2 (Continuing Project) Interstate and Institutional Coordination of the Apalachicola- Chattahoochee-Flint River System - This project will aim at increasing the coordination of federal, intrastate, and interstate agency management actions concerning the Apalachicola River and Bay system.

Initiative 2: Establish a cooperative basinwide management strategy within the State of Florida to direct the preservation and restoration of the Apalachicola River and Bay System. This initiative will be implemented through interagency cooperation and coordination of activities, management schemes and land acquisition efforts that affect the use of natural resources in and along the river and bay.

This initiative is being accomplished to a great extent through the ongoing participation among state and local governments and private entities who serve as members on the TAC.

Project BM4 (New Project) Navigation Maintenance Activity Coordination and Planning - This project will coordinate the review and revision of the Navigation Maintenance Plan (NMP), ACF Comprehensive Study Navigation Component, Sikes Cut Permit, Apalachicola River Navigation Channel Permit, GIWW Permits, and other miscellaneous USACOE navigation projects.

*Do you mean to tell me, Katie
Scarlett O'Hara, that Tara -
that land - doesn't mean
anything to you? Why, land is
the only thing in the world
worth working for, worth
fighting for, worth dying for -
because it's the only thing that
lasts.*

Gone with the Wind

Project BM5 (New Project) Assessment of Permitted Activity Impacts - This effort is directed at increasing the coordination of local, state, regional, and federal permitting criteria for activities affecting the Apalachicola River and Bay other than those specifically identified in the Navigation Maintenance Activities project. Engineering and hydrology support will be provided for other state regulatory efforts. Additionally, some tracking of permitting records will be done to establish a database. The database will be used to determine overall impacts from certain activities such as shoreline stabilization, filling of wetlands, and dock construction.

Initiative 3: Assess statutes, rules, ordinances, management plans, and recommend changes, as appropriate, in regard to consistency among local, state and federal management and regulatory polices and actions.

Project BM3 (Ongoing Project) Apalachicola River and Bay Oil Spill Contingency Plan - This project involves assisting in the development of a site-specific contingency plan for hazardous substance spills on the Apalachicola River and Bay. Efforts to date have not produced a plan for adequate response to a spill on the river or bay. Additional notification and prevention strategies will be researched. Notification procedures will be more widely distributed in order to decrease response time. In addition, an effort will be made to include assistance from private industry.

Land Management/
Land Use Strategy

This strategy involves assessing land uses and nonpoint source pollution contributions to the system. Where appropriate, technical support and recommendations will be provided to local and state governments regarding land planning and land development regulations necessary for protection of the Apalachicola River and Bay. Special area designations and land acquisition for public ownership play key roles in protection of critical and unique habitats. Management of public lands for protection of water quality and habitat should be a priority. The strategic initiatives and respective projects to be undertaken, at least in part through the SWIM program, are listed below.

Initiative 1: Assess the land use activities in the basin in order to

determine nonpoint source contributions to the system.

Project LM1 (Completed Project) Apalachicola Land Use/Cover Assessment - This project provided data for identification of the magnitude of nonpoint source pollution loading to the Apalachicola River and Bay from the Florida portion of the basin. Wetlands were identified to coordinate protection strategies.

Project LM2 (Completed Project) Nonpoint Source Assessment - This project identified the magnitude of nonpoint pollution loading to the Apalachicola River and Bay from the Florida portion of the basin.

Initiative 2: Implement management actions directed toward conservation and restoration of existing public land and water resources within the basin.

Project LM5 (New Project) East Bay/Tates Hell Restoration Project - This project will consist of the development of proposals to generate adequate funding for the acquisition and restoration of the Tates Hell tract. Additionally, this project will include expanding demonstration efforts to other areas within Tates Hell/East Bay drainage basin. The EPA will provide the bulk of this project's funding for the initial demonstration project.

Project LM7 (New Project) Floodplain Restoration Project - This project is designed to coordinate the planning and design of a restoration program for the old floodplain dredged material disposal sites on the Apalachicola River. Initially this project could provide some matching funds for restoring site #39. In addition, some slough restoration work may be pursued. Sites currently listed for restoration will be prioritized.

Public Ownership Benefits

Public land acquisitions for conservation purposes have been documented to:

- create jobs;
- enhance property values;
- increase the local tax base;
- expand and create local businesses;
- attract new or relocating businesses; and
- promote a feeling of local community.

Initiative 3: Coordinate current state and water management district land acquisition programs and expand the Land Acquisition program for the Apalachicola Basin.

The Florida Game and Fresh Water Fish Commission (FGFWFC) is currently assessing and mapping information which will help prioritize lands for acquisition under these public ownership programs. Fisheries information remains to be included in this mapping project. Efforts to complete this assembly of available information should be made by the appropriate departments at FGFWFC.

Initiative 4: Address the adequacy of municipal and industrial stormwater management plans and treatment facilities within the basin.

Project LM6 (New Project) Apalachicola Bay Stormwater Impact Analysis - This project, which includes a monitoring

component, will help determine the stormwater management needs for the City of Apalachicola, East Point, the City of Carrabelle, Lanark Village, and the St. George Island Commercial District. A grant has been received from the Office of Coastal Zone Management (DCA) to conduct a detailed analysis of the “urban” contribution of stormwater to the bay.

Initiative 5: Determine if adequate protection of the water quality and aquatic habitat is afforded by existing policies, practices, management and regulations (e.g., silvicultural and agricultural activities, shoreline stabilization).

Project LM3 (Continuing Project) Creation of Buffer Zones for Protection of Water Quality and Aquatic Habitat - This project includes the implementation of site-specific changes in the management and regulation of silvicultural, agricultural, and shoreline stabilization activities directed towards the conservation and restoration of land and water resources within the Apalachicola River basin. Additionally, this effort provides for expanded review of proposed developments and permit applications, and coordination with various land acquisition projects and activities.

Project LM4 (New Project) Development of PLRGs - This project will assist in the establishment of Pollutant Load Reduction Goals (PLRGs) and Total Maximum Daily Loads (TMDLs) for the Apalachicola system at sites designated in a concurrent EPA project.

Initiative 6: Provide comprehensive review of proposed developments and permits (including residential, commercial, industrial, agricultural, or silvicultural activities) which may adversely impact the aquatic habitat and water quality of the Apalachicola River and Bay. Each activity will be assessed with regard to individual, as well as cumulative, effects. For example, SWIM staff have reviewed project and development proposals and, when necessary, requested special attention or coordination from permitting agencies.

**Public Ownership Benefits
for Pollution Control**

Preserved area functions include:

- mitigation of water, air, and noise pollution;
- reduction of runoff and erosion;
- increase in the quality of runoff water; and
- maintenance of critical groundwater recharge.

Water Quality/Quantity
Management Strategy

This strategy includes the evaluation of historical water quality and quantity data and their relationship with various land management practices. In areas where more data are needed, monitoring programs should be established. Data analysis of physical and chemical properties and interrelationships should be assessed for subsequent application to management decisions. Restoration and retrofitting activities necessary to preserve and restore water quality and quantity will also be addressed through this strategy. The strategic initiatives and respective projects to be undertaken, at least in part through the SWIM program, are described below.

Initiative 1: Improve adherence to existing federal, state, and local laws, statutes, rules, and ordinances through coordination and cooperation among governmental and private entities.

Initiative 2: Maintain and improve water quality in the Apalachicola River and Bay system through control (e.g., regulation, management, treatment) of point and nonpoint sources of pollution. This includes development of pollution load reduction goals and recommendations for actions which will be necessary to establish total maximum daily loads for pollutants that would cause or contribute to violations of state water quality standards in Outstanding Florida Waters (OFW) as required by Chapter 62-40, F.A.C.

Project WQ6 (Completed Project) Apalachicola Point Source Assessment - Determination of the number, condition, and needs of the point source dischargers to the Apalachicola River and Bay. Recommendations to adequately protect the water quality and aquatic habitat from point source pollution will be presented.

Initiative 3: Review and coordinate oversight of all authorized navigation projects and associated navigation maintenance activities to ensure the projects are conducted in a cost effective manner which protects water quality and aquatic habitats of the river and bay system.

Project WQ4 (Completed Project) Dredged Material Disposal Planning - Research and demonstration of alternatives to present methods of dredged material disposal.

Initiative 4: Provide adequate water quality and hydrologic data and analyses to other appropriate disciplines in an effort to better define the relationship of these parameters to biological productivity.

Project WQ1 (Ongoing Project) Apalachicola Bay Geophysical Study: 3-D Circulation Model - Development of a circulation model for Apalachicola Bay to be coupled with a variety of biological studies to examine the freshwater needs of the system.

I hate to see any kind of water messed up. It doesn't matter if you don't fish. What are you going to do 40 or 50 years from now for drinking water?

Franklin "Junior" Arrington
1995

Project WQ2 (Ongoing Project) Water Quality Assessment for the Apalachicola River - Assessment of available data and analysis for determination of ambient water quality in the Apalachicola River; need for a monitoring network will be evaluated.

Project WQ3 (Ongoing Project) Water Quality Assessment for the Apalachicola Bay - Assessment of available data and analysis for determination of ambient water quality in the Apalachicola Bay; need for a monitoring network will be evaluated.

Project WQ5 (Unscheduled Project) Sedimentation in the Apalachicola River System - Determination of the characteristics and destination of fluvial sediment entering the Apalachicola River.

Project WQ7 (Unscheduled Project) The Interaction between Surface Water and Ground Water in Apalachicola Bay - Modification of Bay Water Needs Study three-dimensional model to include ground water and collection of data from monitoring wells.

Project WQ8 (Ongoing Project) Salinity Front Study in Apalachicola Bay - Assessment, monitoring, and analysis of the location and residence time of existing salinity fronts to determine the impact of the front on estuarine productivity.

The fate of this renewable resource depends on the continued maintenance of the natural flow and water quality of the Apalachicola River.

Dr. Robert J. Livingston, 1977

Project WQ9 (New Project) St. George Island Sewer/Septic Assessment - This project, coordinated by the Department of Health and Rehabilitative Services (HRS), is intended to assess the impacts upon water quality in Apalachicola Bay resulting from sewage disposal methods and practices on St. George Island. This project is funded through HRS and SWIM.

Project WQ10 (New Project) Apalachicola Bay Water Quality Modeling - The model will quantify a nutrient budget for the bay including nutrients entering the waterbody from both point and nonpoint sources, from atmospheric deposition, and from exchange with the Gulf of Mexico.

Initiative 5: Support public use of sustainable activities (e.g., educational, recreational, commercial fisheries) in the Apalachicola River and Bay in a manner which protects the natural resources.

Initiative 6: Evaluate and implement actions determined necessary to maintain or restore the hydrologic functioning of the system.

Biological Resource Management Strategy

This strategy involves the examination, correlation, and evaluation of hydrological and biological information for application to management decisions related to the protection of biological resources. In cases where limited data are available, research and

monitoring programs have been or will be established. Biological data and correlations with hydrologic information will be analyzed. Restoration of habitat(s) will be pursued based on needs assessment. The strategic initiatives and respective projects to implement the biological resource management are described below.

Initiative 1: Inventory and document existing data. Support and contribute to a database which has the capability to estimate potential impacts to Apalachicola River and Bay biological resources from local development, land use changes and other activities (e.g., silvicultural, agricultural, recreational, and dredge and fill activities, navigation, upstream withdrawals).

Project BR1 (Ongoing Project) Coupling of Primary and Secondary Production in the Apalachicola System - Evaluation of the relative importance of terrestrial versus phytoplankton primary productivity to secondary consumers in the estuary.

95 percent of all commercially and recreationally harvested species from the Gulf of Mexico spend some of their life in an estuary.

Woody Miley

Project BR2/3 (Ongoing Project) Examination of Nutrient Transport and Primary Productivity within the Apalachicola River and Bay: Development of a Nutrient Budget - Examination of nutrient transport within the system and the development of a nutrient budget for the river and bay. Evaluation of the effects of nutrient loading, particularly nitrogen, on primary production in the estuarine area.

Project BR4 (Ongoing Project) Examination of Factors Influencing Productivity in Tidal Marshes Adjacent to Apalachicola Bay - Assessment of primary productivity in coastal marshes and the influence of environmental variables such as river flow and salinity.

Project BR6 (Unscheduled Project) Examination of Effects of Salinity on Oyster Distribution in Apalachicola Bay: Field and Laboratory Investigations - Laboratory and field observations on feeding and locomotory activity of various oyster predators and their relationship with salinity.

Project BR7 (Ongoing Project) Examination of Distribution Patterns of Dominant Organisms and Habitats in Apalachicola Bay: Influence of Salinity and Other Environmental Factors - Statistical evaluation of the influence of various environmental factors on the abundance patterns of dominant species and habitats in Apalachicola Bay.

Project BR8 (Unscheduled Project) Biological Monitoring Program of the Apalachicola River and Bay - Long-term biological monitoring of the Apalachicola River and Bay to establish trends or impacts due to upstream and/or adjacent alterations to the system.

Project BR9 (Unscheduled Project) Evaluation of Biological and Physical Impacts of Mechanical Redistribution on Disposal Sites of the Apalachicola River - Biological and physical assessment and monitoring of sedimentation near dredged

material disposal sites on the Apalachicola River.

Project BR11 (Ongoing Project) Characterization of Aquatic Habitats within the Apalachicola River Basin - Aquatic habitat descriptions, habitat use, and river flow/stage information for habitats in the Apalachicola River floodplain.

By eliminating the natural flooding processes, the productivity of fish populations alone is reduced by 98 percent.

Dr. Robert J. Livingston, 1992)

Project BR12 (Unscheduled Project) In-stream Flow Requirements of Selected Aquatic Species Within the Apalachicola River Basin - Examination of habitat and life history information to develop in-stream needs of selected species in the Apalachicola River.

Project BR14 (Ongoing Project) Comprehensive Integration of the Apalachicola River and Bay Biological Database: Coupling of Past and Proposed Studies - A continuous integration process by which biological research will be reviewed and integrated to provide a more thorough understanding of the ecosystem.

Project BR15 (New Project) River Habitat Mapping and Monitoring - The study will compare information gathered in a previous FGFWFC study with habitat types currently observed in the field.

Initiative 2: Maintain, enhance, and conserve the fishery resources of the Apalachicola River and Bay through habitat preservation and effective management of water quality and quantity.

Project BR5 (Completed Project) Associations Between Apalachicola River Flows and Fisheries Harvest - Statistical analysis of long-term fisheries landings and river flow data.

Project BR10 (Completed Project) Spoil Site Restoration, Apalachicola River - Demonstration project to determine the feasibility of a large scale restoration program for old floodplain disposal sites.

Project BR13 (Completed Project) Slough Re-opening for Cold Water Refuge - Habitat restoration of sloughs whose connections with the river have been closed or partially closed during critical flow periods.

Initiative 3: Evaluate and implement actions necessary to maintain or restore the biological functioning of the system. In particular, maintenance of water quality and adequate freshwater inflows into the Apalachicola River and Bay system are necessary to sustain the ecological productivity and must be maintained.

Initiative 4: Determine those areas with high biological value and vulnerability that should be protected through public ownership.

Public Education and

Awareness Strategy

The salvation of the Florida scene will come about only if the public savors its beauty, understands its limitations, and speaks for its preservation.

*Marjorie Harris Carr
1990*

Greater public awareness of ecological functions and relationships and preservation/restoration needs of the Apalachicola River and Bay is critical if use and management of the resources are to be accomplished in a manner that provides for continued health of the ecosystem. This program will provide the means for both managers and users to better understand the rationale for preservation/restoration activities on the Apalachicola River and Bay. The strategic initiatives and respective projects to be undertaken, at least in part through the SWIM program, are described below.

Initiative 1: Expand the role of environmental education to increase public awareness of natural resources of the Apalachicola River and Bay, ways to protect and preserve those resources, and proper management of those resources within the basin. This initiative should be coordinated with such agencies as the Apalachicola National Estuarine Research Reserve and the Apalachicola Bay Aquatic Preserve.

Project PE1 (Completed Project) Educational Working Group - Establish an Educational Working Group (or join a similar existing group) for exchanging ideas, setting project priorities, and producing cooperative public education and awareness activities and educational materials to fill the environmental awareness needs of the Apalachicola River and Bay system.

Project PE2.1 (Completed Project) "WaterWays" Chapter Five and Its Companion Slide/Tape and Video Presentation - Designed and developed the localized lesson for use as the fifth chapter in the students' consumable workbooks and the teachers' guides and as the fifth part of the slide/tape presentation for WaterWays. Also developed and produced an accompanying educational video which highlighted broad water resource issues and specific environmental aspects of the Apalachicola basin.

Project PE2.3 (Unscheduled Project) Bulletin Board Kits - Design, develop and distribute to all elementary schools in the basin environmental education materials in bulletin board kits; each kit will detail different aspects or issues, such as water-related resources, habitats, the water cycle, water conservation, behavioral and activity changes that can help preserve and improve water quality, basinwide and watershed management, stormwater treatment, responsible recreational behavior, surface and ground waters of the basin.

Project PE2.4 (New Project) Marine, Estuarine, and/or Riverine Teacher Workshops - Teachers will be taught the importance and significance of the estuary, stormwater runoff, basinwide management and the interdependency of the system's components. This project would reimburse public school teachers for the cost of attending the workshop.

Initiative 2: Initiate programs which offer hands-on experience to enhance the understanding and appreciation of how the Apalachicola ecosystem functions.

Memory is like a child walking along a seashore. You can never tell what small pebble it will pick up and store away among its treasured things.

Richard Vogel

Project PE2.2 (Ongoing Project) Marine, Estuarine, and/or Riverine Science Course Expansion (for Field Trips, Lab Materials, etc.) - Provide funding to reimburse schools or provide the materials to schools in the basin for school buses, gasoline, bus drivers, and drivers' lunches (and any other related expenses) for field trips. Provide funding for lab equipment and materials or the actual equipment and materials to schools as needed.

Project PE4.3 (Ongoing Project) Stewardship Program - Establish a stewardship initiative whereby volunteers will perform water quality tests and learn about a variety of issues including resource preservation, ecosystem management, and habitat protection. Provide participants with broad information and educational opportunities, which will promote stewardship and foster environmental awareness.

Initiative 3: Create and maintain a high level of public awareness of the system, its natural resources, and management issues. This task can be implemented through media relations, public presentations, displays, regular contact with local governments and legislators, and community involvement activities.

Project PE3 (Ongoing Project) Media Relations - Develop press releases and articles for publication in newsletters, newspapers and magazines; news and feature stories for broadcast on radio and television; and public service announcements for dissemination through all types of media in order to inform area residents about the value of the Apalachicola River and Bay System, basinwide and watershed management, treatment of stormwater runoff, the various regulatory and management programs affecting the river and bay system, preservation and restoration activities, basin habitats and natural resources, responsible recreational behaviors, and the simple behavioral and activity changes which can help preserve and improve the water quality.

Project PE4.1 (Completed Project) Slide Show on the ACF River and Bay System - Develop a slide show on the system which includes information on the system, priority issues in the basin, the Apalachicola River and Bay System SWIM Plan, the principles of stormwater treatment, and the principles of basinwide and watershed management. The slide show shall be adaptable for different audiences, such as Boy Scouts or Girl Scouts, Chambers of Commerce, and local clubs and organizations.

Public acquisition and environmental education are the only means of saving environmental concerns

Woody Miley

Project PE4.2 (Completed Project) Exhibit Pieces on the Apalachicola River and Bay System - Develop exhibit pieces about the system and about SWIM projects in the basin and

display them at community events such as the Apalachicola Seafood Festival and public locations such as schools, courthouses, and city halls.

Project PE5 (Unscheduled Project) Integration of Fishermen and Scientists' Knowledge - Introduce participatory research methods to the scientific and traditional communities. Develop a communications-based research process that can be used in other natural resource research projects. Provide water resource managers with an analysis of the importance of freshwater inflows to fishery production in Apalachicola Bay that is acceptable to both the scientific and the fishing communities. Identify potential causal mechanisms behind the statistical correlations of flows and landings that are worthy of direct experimentation.

Initiative 4: Create and enhance awareness of the ACF River System and basinwide management issues in the private and government sectors.

Project PE6.1 (Ongoing Project) Public Awareness of and Involvement in ACF Issues - In order to create or increase awareness and encourage participation, information about the development of the Comprehensive Study will be disseminated through a variety of means including publications, media, workshops, and conferences.

Project PE6.2 (Completed Project) 1992 Tri-State ACF Basinwide Management Conference (April 8, 9 and 10, 1992) - Organized the conference so that presentations will cover a wide range of subjects including management, technical, and legal issues. The overall goal of the conference was the incorporation of these ideas into the development and implementation of basinwide management strategies.

Table 2. Apalachicola River and Bay SWIM Project Evaluation Criteria

The following criteria were used by TAC members to evaluate each of the new and unscheduled SWIM projects. Score indicators (i.e., 1 to 5) for each criterion were placed on an attached worksheet. Scores were totaled for each project and a preliminary rank was given to all projects. Additional criteria and/or comments for discussion were taken into account. Project scores and rankings are given in Table 3.

CRITERIA RELATING TO MANAGEMENT GOALS

- (1) Does the project fit in with the SWIM goals and objectives?
(poor fit) 1 2 3 4 5 (good fit)
- (2) How useful will the resultant information or product be toward achievement of the goals and objectives?
(not useful) 1 2 3 4 5 (useful)
- (3) Does the project answer important management questions on the Apalachicola system?
(unimportant) 1 2 3 4 5 (important)
- (4) Is the project timely?
(least timely) 1 2 3 4 5 (most timely)

CRITERIA RELATING TO PROJECT DESIGN

- (5) Is the project feasible?
(unfeasible) 1 2 3 4 5 (highly feasible)
- (6) Does the project answer the question proposed?
(poorly designed) 1 2 3 4 5 (well designed)
- (7) How does the project tie in with other projects, plans, etc. either proposed or under way?
(poorly integrated) 1 2 3 4 5 (well integrated)

GENERAL CRITERIA

- (8) What is your overall evaluation of the project?
(poor) 1 2 3 4 5 (good)

Any additional comments _____

Table 3. Apalachicola River and Bay SWIM New and Unscheduled Project Evaluation and Priority Rankings

ID#	PROJECTS	NFWWMD	DEP	GFC	ANERR	MEAN	RANK
	BASIN MANAGEMENT						
BM4	Navigation maintenance	34	30	28	35	31.8	6
BM5	Permitted activity impacts	32	37	38	36	35.8	1
	LAND MANAGEMENT						
LM4	Development of PLRGs/TMDLs	28	32	29	28	29.3	10
LM5	East Bay/Tates Hell restoration	38	35	33	36	35.5	2
LM6	Franklin Co. stormwater assess.	27	28	20	29	26.0	13
LM7	Floodplain restoration	37	33	28	34	33.0	4
	WATER QUALITY/QUANTITY						
WQ5	Lake Seminole sediment	24	21	21	25	22.8	15
WQ7	Grnd/surface water interaction	29	27	31	29	29.0	11
WQ9	St. George sewer/septic	31	31	38	31	32.8	5
WQ10	Bay WQ modeling	33	24	36	26	29.8	9
	BIOLOGICAL RESOURCES						
BR6	Salinity v. oysters	29	21	23	25	24.5	14
BR8	Biological monitoring	30	22	36	32	30.0	8
BR9	Impacts of mechanical distrib.	30	34	31	31	31.5	7
BR12	Instream flow requirements	28	24	26	28	26.5	12
BR15	River habitat map/monitor	31	38	35	33	34.3	3
	PUBLIC EDUCATION*						
PE2.3	Bulletin board kits	24	25	39	32	30.0	2
PE2.4	Teachers' workshops	32	29	40	36	34.3	1
PE5	Fishermen/scientists' knowledge	26	21	24	29	25.0	3

* Only new and unscheduled projects were evaluated and ranked. Projects were evaluated and ranked independently of other projects.

Table 4. Projects' Suggested Funding Sources and Agency Participation

ID#	PROJECTS	STATUS*	FUNDING SOURCE			AGENCY PARTICIPATION****
			COMP. STUDY**	SWIM***	OTHER	
AP1	Plan Management	C		P		All State & Local Agencies
BM1	Legal Strategies	C	COE	A		Attorney General/UF
BM2	Interstate Coordination	C	FL	P		DEP/All State Agencies
BM3	Oil Spill Contingency	O		A		DEP/RPC/COE(O&M)/CG/TDW
BM4	Navigation Maintenance	N		P		All State Agencies/USFWS
BM5	Permitted Activity Impacts	N		P		DEP/ANERR/GFC/COE/Counties
LM3	Buffer Zones	O		A		GFC/DEP/WMD/USFWS/TNC/TPL
LM4	Develop PLRGs	N		P		DEP/EPA
LM5	East Bay/Tates Hell Restor.	N		A		EPA
LM6	Franklin Co. Stormwater	N		A	FCZM/NOAA	DEP/DCA/Franklin Co./Cities
LM7	Floodplain Restor.	N		A		WMD/GFC/ANERR/DEP/COE(O&M/1135)/USFWS
WQ1	Hydromodeling	O	FL/SA/GA	P		WMD/NSF/COE-WES
WQ2	River WQ Assessment	O		P		WMD/DEP/USGS/FSU
WQ3	Bay WQ Assessment	O		P		WMD/DEP/USGS/FSU
WQ5	Lake Seminole Sediment	U		A		FSU/USGS
WQ7	Grnd./Surf. Water Interaction	U	COE	P		WMD/USGS/FSU
WQ8	Salinity Fronts	O	SA	P		DEP/FSU/ANERR/NSF
WQ9	St. George Isl. Sewer Septic	N		A	HRS	WMD/ANERR/DEP/Franklin County
WQ10	Bay WQ Monitoring	N				
BR1	Primary/Second. Coupling	O	COE	P		DEP/FSU/ANERR/NSF
BR2/3	Nutrient Budg./Prim. Prod.	O	GA/SA	P		DEP/FSU/ANERR/NSF
BR4	Tidal Marsh	O	SA	P		DEP/GFC/ANERR
BR6	Salinity Fronts	U				
BR7	Salinity v. Dom. Organisms	O	GA/FL/SA	P		DEP
BR8	Biological Monitoring	U		A		GFC/USFWS/WMD/ANERR/FSU
BR9	Impacts of Mech. Distrib.	U				COE/GFC
BR11	Riverine Habitat	O	FL/SA/COE	A		GFC/USGS/USFWS/DEP
BR12	Instream Flow Requirement	U	COE			USGS/GFC/USGS
BR13	Slough/Creek Reopening	U		A		COE
BR14	Data Review & Integration	O	GA/FL/SA	P		WMD/FSU
BR15	River Habitat Map/Monitor	N		P		WMD/GFC/USGS
PE2.2	Field Trip Expansion	O		P		WMD/ANERR/Counties
PE2.3	Bulletin Board Kits	U		P		WMD
PE2.4	Teacher Workshops	N		A		ANERR
PE3	Media Relations	O		P		WMD
PE4.3	Stewardship	O		P		WMD/ANERR/DEP/Counties/DOE
PE5	Fisherman/Scientist Knowldg	U		A		FSU
PE6	General Public Awareness	O		P		WMD
PE6.1	ACF Public Awareness	O		P		WMD

* Project Status: O=Ongoing; N=New; C=Continuing; U=Unscheduled

** Comprehensive Study Projects: GA=State of Georgia; FL=State of Florida; COE=U.S. Army Corps of Engineers; SA=Florida State Special Legislative Appropriation

*** SWIM Participation: A = Administration&/or Coordination; P = Primary Funding Source

**** These agencies should participate to some degree in accomplishing the designed project (e.g. staff time, logistical support): ANERR = Apalachicola National Estuarine Research Reserve; FSU=Florida State University; UF=University of Florida; DCA=Department of Community Affairs; DEP=Department of Environmental Protection; FGC=Florida Game & Fresh Water Fish Commission; USFWS=U.S. Fish and Wildlife Service; USGS=U.S. Geological Survey; WMD=Northwest Florida Water Management District; RPC=Regional Planning Council; EPA=U.S. Environmental Protection Agency; USF=University of South Florida; STAR=Service Through Applied Research; NSF=National Science Foundation; FACEE=Florida Advisory Committee on Environmental Education; FCZM=Florida Coastal Zone Management; TNC=The Nature Conservancy; TPL=Trust for Public Land

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