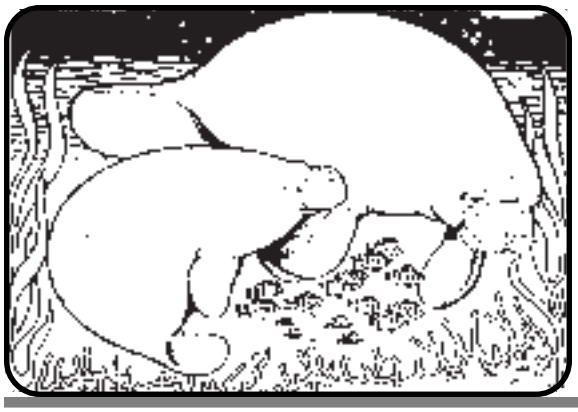

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Introduction

Florida is recognized as one of North America's most important reservoirs for biological diversity with approximately 668 terrestrial and fresh water vertebrate and some 3,500 vascular plant species.[1] Many of these species of flora and fauna are not found anywhere else but Florida.

The 5,096 square miles of land and water in the northeast Florida region lie within the lower part of the Atlantic Coastal Plain and contain a diverse mixture of land cover types that range from coastal marshes to upland oak hammocks and scrub areas. This diverse network of natural resources includes commercial and natural forest areas, rivers and associated wetlands, springs and other undeveloped lands — all of which provide economic, environmental, habitat, recreational, and aesthetic benefits to the residents and visitors of the region. The large forested areas in the region support or otherwise provide refuge on both a long-term and short-term basis for a wide range of animal and plant species, some of which are rare, threatened, endangered, or of special concern. Approximately 87 percent of the region is land area with the remaining 13 percent being water area.

The St. Johns River is the dominant natural resource in northeast Florida. It is the state's longest river, traversing northward 300 miles from its origin west of Ft. Pierce to the Atlantic Ocean in Duval County. Within the northeast Florida region, the St. Johns River passes from south to north through Flagler, Putnam, Clay, St. Johns, and Duval counties before discharging into the Atlantic

Ocean at Mayport in Jacksonville. The tributary systems entering the St. Johns River are generally blackwater in nature and drain mainly low pine lands. Downstream of Doctors Lake most of the tributaries of the river have considerable urban development, both residential and industrial.

Trends And Conditions

The northeast Florida region has seen a steady increase in population growth over the last 20 years. The 1990 Census showed that population in the region had grown by 53 percent over the 1970 population. Population estimates for 2010 from the Bureau of Economic and Business Research indicate that the population will grow by another 27 percent over the 1994 estimates. Northeast Florida has not experienced the growth that other parts of the state have experienced. This has resulted in the present existence of large tracts of undisturbed native vegetative communities and habitats within the region which support a wide variety of native species. However, projections indicate that the region will begin to grow faster than the rest of the state, on a percentage basis, between 1994 and 2010.

Population growth can indirectly indicate the stress placed on the environment.[2] However, simply looking at population growth does not fully explain the impact of changing development patterns on the region's natural resources. As encountered in other parts of the state, growth in northeast Florida has resulted in an expansion of suburban-type development around existing urban areas which has resulted in the conversion of land use. An examination of the 10 census tracts with the greatest population growth within the region between 1980 and 1990 (Table 5.1) shows that growth has occurred to the south and east of downtown Jacksonville. These are areas that previously were primarily rural in nature. The urban core of Jacksonville has experienced the greatest decrease in population, reflecting the nationwide trend of population decreases in the inner city. **The adopted County Comprehensive Plans in the region indicate that this trend of expanding suburban and urban growth radiating away from the City of Jacksonville in a mainly southernly and easternly direction is likely to continue.**

This growth has placed additional pressure on the native wildlife and plant species of northeast Florida. The primary problem confronting the State's plant and wildlife communities and species is the loss of habitat.[3] The majority of listed species in the region have been identified as such as a result of a loss of their native habitats and the resulting restriction on their natural ranges. In addition to the direct loss of habitat, growth and development have resulted in the fragmentation of remaining natural habitat. As land is cleared for development purposes, existing habitats are either lost or reduced in size and isolated from one another to a point that adversely impacts the species inhabiting these areas.

Although much of the growth in northeast Florida has resulted in the conversion of land to urban uses, little data exists on a regional level to quantify the types, quality, and amounts of habitats that are being converted and/or lost. **There exists a need in northeast Florida to perform a comprehensive inventory and analysis of the habitat types that are being converted to suburban and urban uses and are projected to be**

impacted by future growth. There are a number of data bases available which can provide some of this information; however, they exist in a number of locations throughout the state. **A coordinated regional effort to develop and centrally locate accurate information about existing locations of rare, endangered, and threatened species and of critical habitats is crucial to the management and protection of affected species and communities in northeast Florida. This information will be essential to the management and protection of listed species and habitat both on a regional and on a statewide basis.** This data is needed for decision makers, especially as it relates to acquisition programs within the region.

Suburban-type growth has stressed the environment and native habitats

Water Resources

The region is drained by four major surface water basins. These include the Lower St. Johns River Basin, Upper Coastal Basin, St. Marys River, and the Nassau River Basin.

- ***The Lower St. Johns River Basin***

The lower St. Johns River Basin drains approximately 50 percent of the area within the northeast Florida region. Water quality in the southern portions of the St. Johns River within the northeast Florida region is judged to be good, especially at its confluence with the Oklawaha according to the DEP *1994 Water Quality Assessment for the State of Florida*. **The water quality of the St. Johns tends to degrade as it moves north through the region.** The Haw Creek/Crescent Lake/Dunns Creek system is the first major tributary of the St. Johns in the region. This tributary shows DO and nutrient problems attributable to agricultural runoff, septic tanks and WWTP effluents.

The Rice Creek, and the Black Creek/Peters Creek tributary systems have had identified water quality problems in the past. DEP is continuing to work with a major industrial entity to correct and improve water quality in both Rice Creek and the St. Johns River. Peters Creek has been impacted by agricultural and dairy land uses, and has been labeled as "seriously impaired" by the Nonpoint Sources Assessment. The SJRWMD and DEP have undertaken projects to correct past problems and improve the water quality of this tributary.

The sub-basins of the Julington and Durbin Creeks are experiencing some of the most rapid development within the lower St. Johns River Basin. This has resulted in increased siltation which has adversely impacted fish breeding grounds with an associated decrease in fish populations in these sub-basins. DEP has imposed waste load allocations for the numerous small WWTPs within the sub-basins. It is estimated that about one-half of the wetlands in the Julington Creek drainage basin have been lost in the last 20 years.

Doctors Lake on the west side of the St. Johns is highly eutrophic as a result of excessive nutrient loading from historic WWTP discharge, septic

tank leachate and urban runoff. Monitoring in Doctors Lake indicates elevated levels of phosphorus (SJRWMD DWMP). WWTP discharges have been diverted to the St. Johns River in an attempt to improve water quality; however, the Lake still exhibits eutrophication problems primarily due to storm water runoff, poor circulation and limited hydraulic flushing.

The area of the St Johns River Basin within Duval County is the largest industrialized area in the region and has a high concentration of residential use. The St Johns River in this area shows some of the most concentrated water quality problems within the lower basin.[4] According to the DEP *1994 305(b) Report* and the St Johns River Water Management District *Water Management Plan,* there are a wide range of water quality problems in this area of the river which include dissolved oxygen, elevated nutrients, bacteria and toxics. Ulcerated Disease Syndrome has been found in numerous fish species within the lower St. Johns over the past decade. It is unknown whether this disease is attributable to pollution levels in the river.

In the past, much of the pollution in this area of the river was attributed to the sandblasting and painting at the Jacksonville Shipyards. The Shipyards are closing so this source of pollution will be less of a problem. Two other major sources are the Buckman Street WWTP which discharges 52 mgd and Jefferson Smurfit with a total discharge of 14 mgd. The Buckman Plant provides good treatment, except during those times when industrial wastes upset the treatment process, which occurs occasionally. The tributaries that enter the river in this area are more heavily polluted than the river itself. This is especially true as it relates to sediments. Cedar River has been identified, in the *1994 Water Quality Assessment for the State of Florida*, as having the worst water quality in the area. This tributary has an adverse impact on the water quality of the St. Johns River itself.

The Ribault River, lower Trout River and Moncrief Creek empty into the St. Johns River just north of the bend area and contribute to the pollution load in the river. Downstream from the Trout River, the Seminole Paper Company discharges approximately 20 mgd into the river. Closer to the mouth of the river, flushing and dilution improve water quality.

The northeast Florida region has recognized the importance of improving and maintaining the water quality of the St. Johns River and its tributaries. The region also recognizes the need for a coordinated regional approach to the management and protection of this resource. Recognizing this, the region has created the St. Johns River Lower Basin Water Quality Commission (SJRLBWQC), which is comprised of local government elected officials and private citizens from each of the counties which border the river, and federal, state, and regional agencies within the region with decision-making power which could impact the river. The SJRLBWQC has resulted in a coordinated water quality monitoring effort, which has reduced the duplication of monitoring activities and enhanced the sharing of data between various agencies. This will provide more accurate information, at a reduced cost, which can be used for management decisions involving the St. Johns River.

- *St. Marys River Basin*

The St. Marys drainage basin covers approximately 1,610 miles, with about 60 percent of the drainage basin or 966 square miles located in Florida. Within the St. Marys basin there are two Outstanding Florida Waters (OFW), the Okefenokee National Wildlife Refuge and the Ft. Clinch State Aquatic Preserve.

Diminishing water quality is a concern of the region

The St. Marys River originates in the Okefenokee swamp at the western portion of the basin and flows east to the Amelia River and the Atlantic Ocean. The St. Marys has an extensive marsh system and exhibits good water quality. However, there are three areas of concern within the St. Marys basin. The South Prong of the St. Marys has displayed problems with high bacteria and nutrient concentrations in the past.

The Amelia River forms the estuarine portion of the St. Marys basin and has a drainage area of approximately five square miles. Water quality in this estuary area has been identified as fair with identified DO, water clarity and nutrient problems according to DEP. The Amelia River is impacted directly by discharges from the Fernandina Beach WWTP, two pulp and paper mills, and urban runoff from Fernandina Beach and Amelia Island. A site specific alternative criterion of 3.2 mg/l dissolved oxygen has been issued for that portion of the Amelia River in the vicinity of the Rayonnier Inc. paper mill discharge point during certain tidal flows.

- *Nassau River Basin*

The Nassau River Basin covers approximately 430 square miles of area made up of predominantly forest and wetlands. In the past there has been limited data on water quality for this basin. The Mills/Alligator Creek drainage is moderately impacted from dairy activities, septic tanks, and urban runoff according to the Nonpoint Source Assessment. Mills Creek exhibits poor water quality.

- *Upper East Coast Basin*

This basin starts south of Jacksonville at its northern end and runs south to New Smyrna Beach. The drainage area is approximately 730 square miles. This basin is characterized by a strip of coastal ridges separating the Atlantic Ocean from a narrow lagoon system and the mainland. This lagoon system is connected by the Intracoastal Waterway (ICWW). The major lagoons in the northeast Florida region are the Tolomato River which is between St. Augustine and Jacksonville, and the Matanzas River from St. Augustine to the Matanzas Inlet. The Guana River is a lagoon separate from the ICWW which is situated roughly parallel and east of the Tolomato River. A portion of the Tolomato River within Flagler County has been recently designated as a National Estuary Research Reserve by the Governor and Cabinet.

The primary use of surface waters in this basin is for recreation and sport fishing. The Matanzas and Tolomato Rivers are classified for

shellfish harvesting but are closed to shell fishing. Around St. Augustine, the Matanzas River is affected by urban runoff, WWTPs and port activities. In this area the river exhibits elevated nutrient concentrations and some metal problems.[5]

Ground Water

The Floridan Aquifer is the principal ground water source in northeast Florida, with the surficial aquifer providing the source of public potable water supply for select areas within the region. Water quality in the Floridan aquifer is generally good in the northern and western portions of the region. Chloride and TDS concentrations in the Floridan exceed the secondary drinking water standards in isolated areas throughout the region.

The St. Johns River Water Management District predicted changes in the potentiometric surface of the Floridan aquifer between 1988 and 2010 based on current 2010 water supply plans. The model indicated the greatest change for the region of the Floridan will occur in eastern Duval County and northern Clay and St. Johns counties. The SJRWMD also predicted change in the elevation of the water table of the surficial aquifer system for 1988 to 2010. The model predicted the greatest changes in the region for this aquifer will occur in portions of Flagler, Clay and St. Johns counties. The SJRWMD also modeled salt water intrusion and up coning in the northeast Florida region for the years 2010, 2060, 2110 and 2985. This model indicates insignificant saltwater migration in both lateral and vertical directions for these time periods.

According to the *St. Johns River Water Management District Plan*, recharge to the Floridan aquifer occurs mainly in the western portion of the region. Recharge occurs primarily in western Clay County, through sinkholes and lakes that are connected to the aquifer in the Keystone Heights region. In Putnam County, areas of high recharge to the Floridan aquifer are located in the northwestern part of the county and in the Fruitland peninsula area in the southeast. Putnam and Clay counties have some areas in the highest recharge categories. On a regional and local basis the areas with lower recharge rates may be as important as the higher recharge rate areas because of the extent of the area these lower recharge rate areas cover.

Water Use/ Water Supply

The primary source of water for all uses in the northeast Florida region is the Floridan Aquifer. In this region the aquifer consists of a series of hydrologically-connected, water bearing zones composed of soft porous limestone, dolomite, and sand bed, and ranges in depth to the top of the aquifer from approximately 49 feet below mean sea level in southern Flagler County to more than 600 feet below the surface in northern Duval County.[6]

Public supply and domestic self-supply of potable water comprises approximately 43 percent of the total fresh water withdrawn in this region in 1994 according to the St. Johns River Water Management District. Public supply is presently the largest single use of freshwater in the region, withdrawing 132.80 million gallons per day (mgd). When combined with self-supply for domestic purposes, which primarily represents household uses, 162.38 mgd of groundwater is withdrawn region-wide (Table 4.1). Commercial and industrial uses account for 28.4 percent of the

TABLE 4.1

Fresh Water Use in Northeast Florida byType of Use 1994 (mgd)

Public Supply	Domestic Self-Supply	Agric.	Power Gen	Comm/ Indust.	Recreation	Abandoned Artesian Wells	Total
132.80	29.58	51.89	17.84	106.93	10.98	26.59	376.61

Source: St. Johns River Water Management District, Annual Water Use Survey, 1994.

TABLE 4.2

Percentage Difference In Water Withdrawal by Source (1990-1994)

County	Fresh Water Ground	Fresh Water Surface	Saline Surface	Total
Baker	-47.14	-80.45	0.00	-54.42
Clay	-6.35	-18.18	0.00	-6.55
Duval	2.61	-32.14	22.72	16.57
Flagler	2.00	-14.17	0.00	0.68
Nassau	7.53	-65.00	60.71	8.22
Putnam	-49.23	150.72	0.00	-2.36
St. Johns	-2.85	-26.62	0.00	-3.48
REGION	-8.32	96.47	22.87	10.51

Source: Florida Statistical Abstract, 1990, St. Johns River Water Management District, Annual Water Use Survey, 1994.

total fresh water utilized in the region. The pulp and paper mills in Duval, Nassau, and Putnam counties are the primary contributors to this use.

Between 1990 and 1994 the region as a whole increased the amount of water it was utilizing from all sources except fresh ground water. The major increase was in the use of surface waters both fresh and saline which were increased by 96.47 percent and 22.87 percent respectively. The usage of fresh ground water decreased by 8.32 percent during this period. Table 4.2 shows the percentage change in water withdrawal by source by county for the region between 1990 and 1994.

The amount of fresh water agriculture utilized in the region has

decreased between 1990 and 1994 from 81.1 mgd to 51.89 mgd. Through the 1970s and the beginning of the 1980s, agriculture increased its use of fresh water. In the mid 1980s fresh water use for agriculture peaked and has since decreased. Between 1990 and 1994 total fresh water utilized for agriculture decreased by approximately 36 percent on a region-wide basis.

The SJRWMD has projected the water supply needs for the 20-year period through 2010. **Projections indicate that the region will utilize an additional 114 million gallons per day by the year 2010.** This equates to a 30.4 percent increase in water use for the region which exceeds the 26 percent increase projected for the entire SJRWMD area. The primary increase will be for public supply as a result of urban population increases and expansion of services into unincorporated areas. According to the SJRWMD, the utilization of water both from ground and surface sources for agriculture and golf courses will decrease by about 6 mgd in the region by the year 2010. The population of the region during this 20-year time period is estimated to increase 33.3 percent.

The SJRWMD has identified water resource caution areas in the *District Water Management Plan.* Water resource caution areas are identified based on the impacts of water withdrawal. The following criteria are used to evaluate the impacts of water withdrawal: impacts to natural systems, impacts to ground water quality, impacts to existing legal users, and failure to identify an adequate public water supply source. Three counties in the region have areas categorized as water resource caution areas. In Flagler and St. Johns counties, projected 2010 ground water withdrawals may cause declines in the water table of the surficial aquifer which could potentially result in significant harm to native vegetation. In Putnam and St. Johns counties, water withdrawal from agricultural irrigation wells causes seasonal interruptions of supply for some domestic self-supply wells in and near the potato and cabbage growing areas of the counties. **In recognition of the importance to the continued growth and development of northeast Florida, the region needs to manage water resources in a manner which will provide for the present and future human and ecosystem needs.** An important basis for managing water resources is to develop accurate projections of needs based on future growth. Local government Comprehensive Plans provide projections of population and water needs. It is important for local governments to evaluate the projections they make in these plans, so that educated decisions regarding this resource can be made. Also the development of needs and sources studies completed by the SJRWMD is an important aspect for decision makers.

Natural Systems

Florida has recognized the need to focus on entire systems when talking about management of significant natural resources. The recent trend at the state level has been a move toward the implementation of programs that deal with all the necessary components of a natural system to protect and manage these resources.

- *Ecosystem Management*

The Department of Environmental Protection (DEP) has been charged to "develop and implement measures to protect the functions of entire

ecological systems through enhanced coordination of public land acquisition, regulatory, and planning programs."[7] The chosen strategy for implementation of this mandate is through Ecosystem Management. 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.

Ecosystem Management is a holistic approach to management of the environment. It recognizes that there are many interconnected systems and subsystems, both biological and physical, which comprise the environment and cannot be managed in isolation from one another. The main theme of ecosystem management is stewardship with four supporting cornerstones. The cornerstones are 1) place-based management, 2) 3) common sense regulation, 3) cultural change, and 4) foundations.

1) Place-based management focuses on areas of sufficient size to address regional hydrological and ecological connections. These areas have been designated Ecosystem Management Areas (EMAs). Private land owners within EMAs will be encouraged to participate in ecosystem management activities, but any such participation will be strictly voluntary.

2) Common sense regulation is concerned with the intent of the law, not the letter of the law. This type of regulation strives to be flexible and consensus-based, not adversarial in nature.

3) Cultural change involves changing the attitudes of agency employees and citizens. Employees need to encourage partnerships between agencies and the people, and citizens need to assume responsibility for the environment.

4) Foundations of ecosystem management are the knowledge and tools that are required for informed decision making. Foundations include training, environmental education, a statewide natural resources atlas and audit, and evaluation of programs.

The ecosystem management strategy encourages innovation, pollution prevention, incentive-based regulatory alternatives, with a sound educational effort to produce collaborative solutions to environmental problems. The northeast Florida region contains three major EMAs and has a very small portion of three other EMAs. The three major EMAs are the Lower St. Johns River, the Northeast Coast Lagoons and the St. Marys-Nassau.

- ***Acquisition***

Florida has one of the most aggressive land acquisition programs in the nation, having spent more than the federal government in the state during the past few years. **Land acquisition has been recognized as a useful tool by both state and local governments as a means for protecting ecologically important areas, important recreational areas and significant natural resources.** Through its various acquisition programs, the state has acquired nearly 1.7 million acres. The St. Johns River Water Management District began a land acquisition program in 1979 and currently owns approximately 320,000 acres of land, with another approximately 380,000 acres of additional land under consideration. Some local

governments have also initiated acquisition programs to purchase environmentally sensitive and recreation areas for their citizenry.

The northeast Florida region has lagged behind other regions of the state in the acquisition of lands for conservation purposes. Overall, conservation land in the northeast Florida region, as of 1988, comprises 11.9 percent of the land within the region, which is well below the 19.6 percent average on a statewide basis.[8] In this region, only Baker County has more land set aside in conservation than the statewide average.

The protection of listed species within the region is a goal of this plan

- ***Local Government Programs***

The City of Jacksonville has implemented the Special Management Areas (SMAs) Program through the adoption of the City's Comprehensive Plan. The City identifies five areas as SMAs: Nassau River-St. Johns River Marshes Aquatic Preserve, the Julington Creek/Durbin Creek CARL project, the Northeast Florida Regional Wildlife Mitigation Park, Cedar Swamp, and the Timucuan Ecological and Historical Preserve.

The goals of the SMA program in Jacksonville are to protect habitat for fish and wildlife with an emphasis on listed species; protect native vegetative communities; protect and/or enhance ecological values and productivity, and archeological and historic preservation; promote education and research; provide recreational opportunities; and promote alternative modes of transportation.[9]

- ***Mitigation Banking***

In response to problems associated with on-site mitigation, Florida Game and Fresh Water Fish Commission in a partnership with the NEFRPC developed and implemented the state's first regional upland off-site mitigation program. This program takes a proactive approach to habitat protection by acquiring significant habitats before they become subject to development pressures. This program also allows for the consolidation of many otherwise small isolated parcels into a larger unit which helps counteract the adverse impacts of habitat fragmentation. This program has allowed for the purchase of approximately 1,900 acres that are presently managed for the long-term protection of upland species.

- ***Greenways***

The state of Florida, in 1993, created the Florida Greenways Commission which is a statewide coalition that is charged with assessing ways to bring existing programs, organizations, and people together under the greenways concept.[10] This step initiated a conscious trend in the state to integrate the greenways concept into other state, regional and local programs which manage natural resources in the state. Twenty-two Greenways have been recognized through Governor's Proclamation to be located either entirely or partially in the northeast Florida region. The purpose of the greenways program is to create a system of greenways linking natural areas and open space in an approach to ecosystems management that will allow the state's diverse native flora and fauna and communties to coexist with the residents of the state.

In northeast Florida, Flagler County has pursued the greenways concept through the acquisition and development of the county's "Coastal Greenway." This Greenway includes state and county parks, water bodies and their associated wetlands, upland habitat, and a state aquatic preserve. This project is an excellent example of a cooperative effort of a number of entities utilizing a number of different tools to implement a greenway. The Coastal Greenway connects a wide array of preservation and conservation lands which stretch from St. Johns County on the north into Volusia County to the south. These lands are protected by a variety of methods including acquisition, DRI donations, regulatory programs and local land development regulations.

Wetlands

Wetlands are an important source of wildlife habitat and are an integral component of natural surface water drainage and filtration systems. Wetlands adjacent to surface waters provide a purifying buffer, stabilize the shoreline, reduce erosion and serve as habitat for many species. Salt marshes function as a buffer between uplands and freshwater or marine systems. Saltwater marshes serve as nurseries for many commercially important marine species and are a protective buffer against storm surges resulting from hurricanes and tropical storms.

In 1984, the Florida Legislature passed Sections 403.91-403.929, F.S., known as the "Warren S. Henderson Wetlands Protection Act of 1984." The Henderson Act required DEP to create an inventory of existing wetlands in the state and to establish a central wetlands monitoring system in conjunction with the Water Management Districts (WMD). This monitoring system is to track impacts on and losses of wetlands from permitted activities and is used to compile an annual report. It is important to note that this monitoring system only tracks permitted changes to wetlands over which DEP and the WMDs have jurisdiction. Unpermitted or unregulated impacts on the region's wetland resources are not included. The various categories used in the DEP's and WMDs' monitoring systems are similar but not identical and the authority over wetlands are not identical between agencies.

In the northeast Florida region, wetland resource management permits issued by DEP from October 1, 1985 through September 30, 1993 resulted in the loss of 224 acres of wetlands, creation of 198 acres of wetlands, 710 acres of wetlands permanently preserved, and improvement of 155 acres of wetlands. Wetlands that are categorized as preserved are wetlands that are protected by easements, covenants and land dedications, not areas which are simply not to be disturbed.

The Suwannee River WMD did not review any projects in the region under its jurisdiction (portions of Baker and Putnam counties) for the October 1, 1985 through September 30, 1992 time period. The SJRWMD, during the October 1, 1985 through September 30, 1992 time period, permitted 1,472 acres of wetland loss, 866 acres of wetland creation and 10,878 acres of wetland preservation in the region. The WMD preservation category includes wetlands which are not destroyed by a project but are not necessarily permanently protected. The jurisdiction differences between the DEP and the WMDs result in a greater area of wetlands under the jurisdiction of the WMDs.

Species and Habitat

Northeast Florida contains a diverse mixture of land cover types that support a number of plant and animal species, many of which are listed as threatened, endangered or species of special concern by the federal government or the State of Florida. Included in the wildlife species that inhabit the region are wide ranging species such as the black bear and American swallow tail kite.

The protection of listed species located within the region is a goal of this plan. The habitat required to support these listed species must be addressed if adequate protection is to be implemented. The habitat requirements for the listed species found within northeast Florida are described in Appendix A, taken from the book series *Rare and Endangered Biota of Florida.*

Listed Species which occur within northeast Florida, as identified by Florida Natural Areas Inventory Element Occurrence Data Base and Florida Game and Fresh Water Fish Commission Site Occurrence Data Base, are as follows:

Common Name	Scientific Name	Federal Rank	State Rank
American Alligator	Alligator mississippiensis	T	SSC
American Oystercatcher	Haematopus palliatus		SSC
Atlantic Sturgeon	Acipenser oxyrhynchis	T	SSC
Anastasia Beach Mouse	Peromyscus polionotus phasma	E	E
Bartram's Ixia	Salingostylis coelestina		E
Black Creek Crayfish	Procambarus pictus		SSC
Bald Eagle	Hialaeetus leucocephalus	T	T
Black Skimmer	Rynchops niger		SSC
Curtiss' Milkweed	Asclepias curtissii		E
Chafseed	Schwalebea americana	E	E
Eastern Brown Pelican	Pelecanus occidentallis carolinensis		SSC
Eastern Indigo Snake	Drymarchon corais couperi	T	T
Fall-flowering Ixia	Nemastylis floridana		E
Florida Black Bear	Ursus americanus floridanus		T
Florida Burrowing Owl	Speotyto cinnicularia floridana		SSC
Florida Gopher Frog	Rana capito		SSC
Florida Mouse	Podomys floridanus		SSC
Florida Pine Snake	Pituopis melanoleucus mugitus		SSC
Florida Sandhill Crane	Grus canadensis pratensis		T

Listed Species cont.

Common Name	Scientific Name	Federal Rank	State Rank
Florida Scrub Jay	Aphelocoma coerulescens	T	T
Florida Willow	Salix floridana		E
Gopher Tortoise	Gopherus polyphemus		SSC
Green Turtle	Chelonia polydemus	E	E
Hartwrightia	Hartwrightia floridana		T
Heartleaf	Hexastylis arifolia		T
Lake-side Sunflower	Helianthus carnosus		E
Limpkin	Aramus guarauna		SSC
Little Blue Heron	Egretta caerulea		SSC
Least Tern	Sterna antillarum		T
Leatherback	Dermochelys coriaces	E	E
Loggerhead	Caretta caretta	T	T
Osprey	Pandion haliaetus		SSC
Pipping Plover	Charadrius melodus	T	T
Pondspice	Litsea Aestivalis		E
Red-cockaded Woodpecker	Picoides borealis	E	T
Roseata Spoonbill	Ajaia ajaja		SSC
Sand-dune Spurge	Chamaesyce cumulicola		E
Scrub Stylisma	Stylisma abdita		E
Shermans Fox Squirrel	Sciurus niger shermani		SSC
Southeastern American Kestrel	Flaco sparverius paulus		T
Spoon-leaved Sundew	Drosera intermedia		T
St. John's Susan	Rudbeckia nitida senu stricto		E
Snowy Egret	Egretta thula		SSC
Tricolor Heron	Egretta tricolor		SSC
Tessellated Darter	Etheostoma olmstedi		SSC
West Indian Manatee	Trichechus manatus	E	E
Worthington's Marsh Wren	Cistothorus palustris griseus		SSC
White Ibis	Eudocimus albus		SSC
Wood Stork	Mycteria americana	E	E

The xeric upland areas in Putnam and Clay counties are important to a large number of rare vertebrates. Upland areas in Putnam County, predominately those areas in the north western part of the county, provide important habitat for the Florida sandhill crane, southeastern American kestrel, southern bald eagle, Florida mouse, gopher tortoise, Florida pine snake, and eastern indigo snake. Southeast of Georges Lake, populations and individuals of Florida scrub jay, southern bald eagle, Etonia Rosemary, Bartram's ixia, and the Black Creek crayfish have been recorded.

The mixed forests in south central Putnam County provide strategic habitat for the Florida black bear. Other species sited in this area include the American swallow tail kite, the Florida mouse, Florida scrub jay, southern bald eagle, gopher tortoise and eastern indigo snake.

Sandhill and xeric uplands in Clay County provide important habitat for Florida scrub jay and Florida sandhill crane. Southern parts of the Camp Blanding Wildlife Management Area and area surrounding Goldhead State Park are inhabited by red-cockaded woodpecker, Florida scrub jay, a little blue heron rookery, with Bartrams ixia and hartwrightia also found in this area.

Wetlands and forested areas of south central Flagler and southeast Putnam counties south of S.R 305 east of I-95 provide habitat for Black Bear, American swallow tail kite and the southern bald eagle. Limpkins and southeastern American kestrel have also been recorded in these areas. These areas are contiguous with the forested and wetland areas south of the northeast Florida region which also provide strategic habitat for Black bear and the southern bald eagle. The area along Dunns Creek and around Crescent Lake provides a dispersal area for the Florida black bear population from the Ocala National Forest and contains white ibis and little blue heron rookeries. A number of eagle nests are also located throughout these areas.

Wood stork and other rare wading bird species have been recorded in the forested and wetland areas of eastern St Johns County and southeastern Duval County. More particularly, the Guana River Wildlife Management Area and Guana River State Park contain wood stork, white ibis and little blue heron rookeries. Durbin Swamp and the Pablo Creek area have recorded a wood stork rookery, southern bald eagle nests, and a red-cockaded woodpecker colony.

The large forested areas north of Osceola National Forest in Baker County make up strategic habitat for Florida black bear (particularly Moccassin Swamp, Cross Branch, North Prong of St. Marys River) and rare wading birds (wood stork, white ibis, great egret, and little blue heron). Other species recorded in the area include Florida sandhill crane, and American swallow tail kite. The Osceola National Forest, Pinhook Swamp, and Okefenokee National Wildlife Refuge contain a total of 110 active red-cockaded woodpecker colonies.

Areas around the Nassau and St. Marys Rivers in Nassau County, particularly the wetland areas, represent habitat and foraging areas for wood stork and Smyrna seaside sparrow. The West Indian manatee and numerous wading bird rookeries, including wood stork, great egret, little blue heron and snowy egret, are located along the Nassau River from Smith's Point to Nassauville. Alligator and Mills creeks and the wetlands

associated with these creeks provide foraging areas for wading birds. Two wood stork rookeries, great egret rookeries and habitat for the Smyrna seaside sparrow are located in the Pumpkin Hill Creek area of Duval County.

The coastal areas of Flagler and St. Johns counties provide important patches of natural land cover where many rare species are found. Along the coast from Palm Coast south to Flagler Beach State Park can be found Florida scrub jay, significant shorebird aggregation areas, and leatherback turtle nesting areas. From Palm Coast north to Marineland, including Washington Oaks, can be found Florida scrub jay, gopher tortoise and eastern indigo snake. Marineland to Crescent Beach, including Ft. Matanzas, is habitat for the Florida beach mouse, Wilsons Plover, piping plover and American oystercatcher, as well as shorebird aggregation areas at Matanzas Inlet, Salt Run, and St Augustine. Crescent Beach to Anastasia Island supports west Indian manatee, Anastasia Island Beach mouse habitat, and least tern nesting areas. Vilano Beach to Ponte Vedra Beach supports southern bald eagle, wood stork and great egret.

Land owners' rights must be balanced with conservation goals

The salt marshes in the northern coastal area of Duval County are important to several rare wading bird species. The southern bald eagle, least tern nesting sites, great egret rookery, and habitat for the seaside sparrow are found in the area surrounding Blount Island and nearby islands. Wilson's plover and pipping plover least terns can be found in the area around Huguenot Park and the Mayport Jetties, which also provide an aggregation area for shorebirds. Ft. George and Talbot Islands areas contain least tern nesting areas, loggerhead turtle nesting, and southern lip fern and green ladies tresses. A West Indian manatee aggregation area, habitat for Smyrna seaside sparrow and nesting for least tern are located in the Amelia Island, South Amelia River, and Fernandina Beach area.

Coastal Resources

The coastal areas of northeast Florida provide many valuable functions: 1) They provide habitat for rare and endangered plant and animal species; 2) They provide protection from storms which have the potential to significantly impact the region; 3) They provide recreational opportunities; and 4) They positively affect the economy by attracting tourists to the region. The northeast Florida region has approximately 140 miles of coastline along the Atlantic Coast. The sandy beach is generally backed by a dune system which can reach elevations of 40 feet but is usually 10 to 20 feet high. **It is important as a region to implement strategies to maintain the dynamics of the dune systems because of the benefits they provide.**

From 1980 to 1990, coastal areas experienced higher density increases than the region as a whole.[11] In Nassau

County, development along the coastline extends from Ft. Clinch State Park southward for more than 8 miles and includes a number of resort communities in the unincorporated areas of Amelia Island. Extensive development has occurred south of the St. Johns River in Duval County. In St. Johns County, heavy development is occurring in the Ponte Vedra Beach, Vilano Beach, and Anastasia Island areas. Most of the residential development in the coastal area of Flagler County is occurring in the Palm Coast planned community and in the incorporated areas of Flagler Beach and Beverly Beach.

In Nassau County there are several gaps in the dune system, mostly in the north beach and main beach areas within the city limits of Fernandina Beach and at American Beach. In Duval County, the coastlines of Atlantic Beach, Neptune Beach and Jacksonville Beach have been urbanized and dunes no longer exist. Primary dunes border 93 percent of the St. Johns County coastline, but approximately 58 percent exhibit some degree of modification. In the center third of the Flagler County coastline, the dune ridge is broken in several places.

Much of the east coast of Florida is eroding because wave energies increase from the Georgia border southward with no increase in the littoral drift load supplied at the upcurrent end of any given stretch of beach.[12] The natural southward movement of sediments along the coast, under the influence of long shore currents, erodes coastal barrier islands at their northern ends and builds beaches at their southern ends, resulting in a long term southward movement of coastal features. There are several areas along the region's coast that experience beach erosion. Attempts to stabilize coastal inlets and beaches interrupts the southward movement of sediments, and beaches south of such structures suffer chronic erosion problems. In areas that are protected by seawalls and revetments, erosion occurs and the beach profile is lowered. Jetties exist at the St. Marys Inlet, the St. Johns Inlet and the St. Augustine Inlet. Erosion is occurring near the following areas: south of the St. Johns River, northern Amelia Island, South Ponte Vedra Beach, Southern Conch Island, Anastasia State Park, St. Augustine Beach, Crescent Beach and Marineland.

According to the U.S. Army Corps of Engineers, Duval County is the only county in the region with publicly funded shoreline protection renourishment activities. Since 1985, $13.9 million have been spent on renourishment in Duval County and there is an ongoing project in Duval County estimated at $21 million.[13] Nassau, St. Johns and Flagler counties have not had any shoreline protection renourishment activities in the past 10 years. However, St. Johns and Nassau counties have had maintenance/ dredging material placed on their shores.

Northeast Florida has many miles of estuaries which provide important nursing areas for many species of finfish and shellfish. Some of these fish complete their life cycle entirely within the estuaries and some spend part of their lives in the open ocean. These estuaries provide recreational opportunities and sustain a commercial fisheries industry important to the region. Shell fishing areas in our region include the Ft. George Island area north to the Nassau Sound in Duval County, portions of the Tolomato River just north of St. Augustine, and portions of the Matanzas River

from the Crescent Beach bridge south to the Flagler County line These areas are frequently closed following heavy rains because of high bacteria counts.

Coastal waters are classified by the Department of Environmental Protection (DEP) based on sanitary, hydrographic, meteorologic and bacteriological surveys. Waters are classified for harvest of shellfish as Approved, Conditionally Approved, Restricted, Conditionally Restricted, Prohibited and Unclassified (= Unapproved). Each classification has management procedures which outline when harvesting will be allowed.

Effective January 1996, Duval County had 7,378 acres classified as Prohibited. For south St. Johns County, the current classification is based on a comprehensive shellfish harvesting area survey completed in 1985. Currently in south St. Johns County there are 1,923 acres classified as Conditionally Approved and 365 acres classified as Prohibited. A recent comprehensive shellfish harvesting area survey was performed from 1992 through 1995 which proposes to reclassify the south St. Johns County area. The recommended classification will yield 1,067 acres classified as Conditionally Approved, 791 acres classified Conditionally Restricted and 83 acres classified Prohibited. A comprehensive shellfish harvesting area survey was completed in 1994 for north St. Johns County. Currently in north St. Johns County, there are 662 acres classified Conditionally Approved, 2,320 acres Conditionally Restricted and 2,690 acres classified Prohibited.

All surface waters of the state have been classified according to designated uses from Class I Potable Water Supplies to Class V Navigation, Utility and Industrial Use. Water quality classifications are arranged in order of the degree of protection required, with Class I water having generally the most stringent water quality criteria and Class V the least. Class II waters are designated as Shellfish Propagation or Harvesting. As of April 12, 1995, all four of the coastal counties had surface waters designated as Class II waters.

Seagrasses are submerged flowering plants that live and reproduce in shallow brackish and marine waters. Seagrass beds occur in a relatively narrow range of depths and extend into the low intertidal zone. Seagrass beds are highly productive, and their complex structure provides substrate, habitat, and protection from predators for large populations of invertebrates and fish. In the lower St. Johns River, submerged aquatic vegetation forms dense stands in shallow waters from just south of downtown Jacksonville southward. This vegetated littoral zone is of great importance to recreational fishermen, boaters and wildlife enthusiasts and to the remaining populations of the West Indian Manatee. Seagrasses support epiphytic organisms; produce detritus, a major food source; bind sediments; and take up and accumulate trace or heavy metals. Many economically important fish are present in seagrass beds as juveniles, obtaining both food and shelter from the system.

Many important shellfish and finfish in the region are utilized directly by man and depend on the estuaries for food and shelter during some period of their development. The most important harvested invertebrates in this region include blue crabs, oysters, clams, and three species of shrimp. The most important family of finfish for recreational and commercial fisheries is Sciaenidae which

includes whitings, spotted sea trout, weakfish, croaker and red drum. In 1991 Duval and St. Johns counties were included in the top 15 counties in the state for total pounds of seafood harvested.[14] Duval County harvested 2,161,824 finfish pounds, 481,763 shellfish pounds, and 1,397,700 shrimp pounds for a total of 4,050,803 pounds. St. Johns County harvested 455,203 finfish pounds, 1,643,832 shellfish pounds, and 118,899 shrimp pounds for a total of 2,218,171 pounds.

Forest Land

Forest land is a vital resource in the northeast Florida region. Forests provide habitat for 227 native animals and 470 native plants in Florida that are considered endangered, threatened or of special concern. The forest industry also has a large economic impact on the northeast Florida region. In 1993 stumpage prices, the value of the timber harvest, in the northeast Florida region were $84,784,000. The 1993 forest manufacturing payroll for the region was $281.2 million and the 1993 forest manufacturing output was $777.2 million. In 1995 the Southeastern Forest Experiment Station of the USDA Forest Service completed a survey for 21 counties including the northeast Florida region. In 1995, 70.5 percent of the land in the northeast Florida region was timberland. Baker County has the highest percent of timberland in the region at 87.2 percent and Duval County has the lowest percent of timberland in the region at 46.4 percent.

Air Quality

The U.S. Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection have established ambient air quality standards for six pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. These six pollutants are referred to as "criteria air pollutants" since health-based criteria were used to establish the standards. **In 1995, the northeast Florida region was classified as Attainment or Unclassifiable (treated the same as Attainment) for all six criteria pollutants.** Duval County, the only county in the region designated as Nonattainment for ozone, was reclassified to Attainment/Maintenance by the EPA on March 6, 1995, eliminating any Nonattainment areas in the region. Since 1986, the National Ambient Air Quality Standard (NAAQS) for ozone has been exceeded twice in Jacksonville.[15] Both exceedances were recorded at the Jacksonville Naval Air Station monitoring site. For the three year period 1987 through 1989, the county was not in violation of the ambient air quality standard, having averaged less than one exceedance per year at each of the two monitoring sites. Neither site in Jacksonville has had an exceedance of the standard in 1990, 1991, or 1992. Therefore, the area continued to meet the NAAQS and was eligible to be redesignated from Nonattainment status for ozone to Attainment.

Natural Resources of Regional Significance Issues

STRATEGIC ISSUE: ***Northeast Florida needs to manage its water resources and uses to provide for present and future ecosystem and human needs.***

The primary source of water for all uses in the northeast Florida region is the Floridan Aquifer

Projections of water supply needs **indicate that the region will utilize an additional 114 million gallons per day by the year 2010.** This equates to a 30.4 percent increase in water use for the region. The primary increase will be for public supply as a result of urban population increases and expansion of services into unincorporated areas. The lack of an adequate and relatively inexpensive source of potable water for northeast Florida could adversely impact future growth in the region.

Three counties in the region have areas categorized as water resource caution areas. This designation indicates the potential for adverse impacts to existing legal users, natural systems, or ground water quality, and the failure to identify an adequate public water supply source. In Flagler and St. Johns counties, projected 2010 ground water withdrawals may cause declines in the water table of the surficial aquifer which could potentially result in significant harm to native vegetation. In Putnam and St. Johns counties, water withdrawal from agricultural irrigation wells causes seasonal interruptions of supply for some domestic self-supply wells in and near the potato and cabbage growing areas of the counties. **The northeast Florida region needs to manage water resources in a manner which will provide for the present and future human and ecosystem needs.** An important basis for managing water resources is to develop accurate projections of needs based on future growth. Local government Comprehensive Plans provide projections of population and water needs. It is important for local governments to evaluate the projections they make in these plans so that educated decisions regarding this resource can be made.

Diminished water quality is a concern for numerous surface water bodies throughout the region. The state and the region through the Water Management District has spent millions of dollars to improve water quality of water bodies such as the St. Johns River. The water bodies within the region also provide economic value through recreational opportunities and by drawing tourism. The degradation of water quality in areas within northeast Florida has resulted in loss of jobs and income through the closing of shellfish harvesting areas and a reduction in take of various fisheries. Various state, regional and local efforts are underway to address water quality issues in the region. Better coordination of some of these efforts may result in better efficiency and reduced cost to the entities undertaking these efforts. As a region there is a need to identify and implement strategies to **improve and maintain the water quality in the region to meet ecosystem and human needs.**

STRATEGIC ISSUE: ***How does northeast Florida as a region manage and protect identified Natural Resources of Regional Significance?***

As a region, how do we protect the populations of state and federal listed species within the region?

The northeast Florida region has identified natural resources as regionally significant because of their func-

tion, size, rarity or endangerment. In most cases the protection and/or management of identified natural resources of regional significance are beyond the responsibility of any single entity. A coordinated effort which includes public and private entities and various levels of government is necessary in the identification and protection of these resources. A portion of NRRSs are under private ownership, and the region recognizes the need to balance the rights of the individual land owners with the goal to conserve the value and function of the NRRS. **A strategic issue facing the region is how do we provide for recognizing private property rights while protecting and conserving our Natural Resources of Regional Significance?** In addressing this issue the region has taken an approach that is incentive-based rather than regulatory as has been the approach in the past. The region also recognizes the importance of acquisition as a valuable tool for the long-term protection of NRRS and as a mechanism for addressing the property rights issues. However, the region as a whole lags behind the rest of the state in the amount of land purchased for conservation purposes. **As a region northeast Florida needs to develop strategies for increasing the funds available for acquisition, protection, restoration and maintenance of natural resources in the region.** The region must also maximize the use of these funds through targeting and ranking the areas desired for acquisition programs. Since the region has identified NRRS, they should be given priority as a first option for acquisition funds.

STRATEGIC ISSUE: *The northeast Florida region must work collaboratively to provide for the long-term protection and enhancement of coastal resources.*

The coastal areas of northeast Florida provide significant benefit to the region by attracting tourists and supporting fisheries, by providing unique natural habitat for various plant and animal species, and by providing protection from severe storm events. An analysis of population trends in the region between 1980 and 1990 show that the coastal areas have experienced the largest density increase in the region. The values provided by the region's coastal areas significantly benefit the natural and human environment. The popularity of the coastal areas places significant burden on this resource.

Natural Resources of Regional Significance

The 1993 ELMs legislation that set the requirements for the Strategic Regional Policy Plan requires the Council to identify natural resources of regional significance by specific location, not solely by generic type (Ch. 186.507(11), F.S.). One of the specific purposes of the SRPP as set forth in Rule 27E-5, Florida Administrative Code, (F.A.C.) is to identify natural resources of regional significance and promote the protection of those resources. Rule 27E-5, F.A.C. goes on to define a Natural Resource of Regional Significance as:

> **a natural resource or system of interrelated natural resources, that due to its function, size, rarity or endangerment retains or provides benefit of regional significance to the natural or human environments, regardless of ownership.**

The significance of a natural resource to the northeast Florida community is a function of the benefits it provides to the economic viability and the ecological stability of the region, and its impact on shaping the region's future.

Natural Resources of Regional Significance have been grouped into four categories: 1) Surface Water Systems, 2) Ground Water Systems, 3) Planning and Resource Management Areas, and 4) Coastal and Marine Resources. Some natural resources fall under a number of these categories depending on their purpose and the attributes the resources contain.

The popularity of coastal areas places a burden on this resource

1) Surface Water Systems identified as regionally significant include major streams and rivers within the region. In considering the system the Council included second and third magnitude tributaries of regionally significant surface waters because of the influence these tributaries have in the identified surface waters. Wetlands associated with the major rivers, streams and tributaries were included as part of the surface water system. These wetlands, by providing purification of pollutants, protect water quality of surface waters. They also stabilize the shoreline, reduce erosion and provide habitat and foraging areas for many listed species of animals found in northeast Florida. Major lakes and significant freshwater wetlands are also identified as regionally significant under the surface water category. Wetlands identified as regionally significant are not meant to include any wetlands located landward of man-made canals, structures, channels or ditches, including mosquito control ditches and berms.

2) Ground Water Systems identify major ground water sources which provide potable water to the northeast Florida region. Because of the significant interrelationship between the Floridan aquifer and its recharge areas, the recharge areas have been identified as a Regionally Significant Natural Resource. The highest recharge areas, as a function of inches per year of recharge, in the northeast Florida region are located in western Clay and Putnam counties. The protection of these areas is essential to guarantee a water supply of acceptable quality and quantity for the region.

3) Planning and Resource Management Areas consist of lands already in public ownership. Also included are areas, such as Aquatic Perserves, which have existing special management consideration. The region has identified and mapped verified sites of listed species (as designated by 50 CFR 17.11-12, Rule 39-27, F.A.C. Chapter 372, F.S. and Rule 9J-2, F.A.C.) within northeast Florida as regionally significant natural resources. The data are species site data from the Florida Game and Fresh Water Fish Commission and site occurrence data from Florida Natural Areas Inventory (FNAI). These sites are included on the map of Planning and Resource Management Areas with sites identified by specific species. For all sites identified on the listed species

portion of the Natural Resources of Regional Significance map, the designated sites for these listed species shall be determined by the actual presence on such land. The absence of species on designated lands may be demonstrated by surveys conducted using methods generally approved by the Florida Game and Freshwater Fish Commission or the U.S. Fish and Wildlife Service, or through the demonstration that no habitat is present on the site which would support such designated species.

4) **Coastal and Marine Resources** identified consist of salt marsh, estuaries and coastal fresh water wetlands which play an intricate role in providing propagation, growth and feeding areas for fish and wildlife species which, in turn, play a significant role in economic, recreational and tourism activities in the region. Over 70 percent of the state's commercially important and recreational fish, crustaceans, and shell fish depend on estuaries for all or part of their lives. The beaches and dune areas of the region provide habitat for many listed species including several species of turtles, birds and mammals. The beaches provide recreational opportunities to the citizens that reside in the region as well as a positive economic benefit to the region by attracting tourists from all over the world to northeast Florida. The coastal dune system also provides protection from tropical storms which have the potential to significantly impact northeast Florida. For these reasons, these areas have been identified as regional significant natural resources under the coastal and marine category.

For all mapped Natural Resources of Regional Significance, site specific data when available should be used to identify whether a Natural Resource of Regional Significance is in fact present on the site in connection with any comprehensive planning approvals or amendments or any other land planning decisions. For reserves, wildlife management areas, state and national forests, historical sites, sanctuaries, and state parks, the actual line delineating the boundaries of such are the boundaries as designated by the applicable federal, state or regional agency with jurisdiction. For all wetlands identified as NRRS, the actual line delineating the boundaries is designated by the Surface Water and Wetland delineation rule as identified in Section 62-340, F.A.C. For all surface waters identified as NRRS, the boundaries are delineated by mean high water line in tidal systems and the ordinary high water line in fresh water systems. For all park lands and aquatic preserves identified, the actual boundary line is limited to the legal boundary of the applicable local, state, regional or federal agency's ownership interest in such park or aquatic preserve. For all sites identified on the listed species portion of the Natural Resources of Regional Significance map, the designated sites for listed species shall be determined by the actual presence of such species on such land. The absence of species on designated lands may be demonstrated by surveys conducted using methods generally approved by the Florida Game and Freshwater Fish Commission or the U.S. Fish and Wildlife Service or through the demonstration that no habitat is present on the site which would support such designated species.

SURFACE WATERS

St. Johns/Nassau Valley Marshes
San Pablo Creek
Florida East Coast Estuary
San Sebastian River
Intracoastal Waterway
Moses Creek
Black Creek
Clapboard Creek
Haw Creek
Oklawaha River
St. Johns River
Trout Creek
North River
Yellow Water Creek
St. Marys River
Amelia River
Fort George River
Lower St. Johns River
Matanzas River
Boggy/Mills Creek
Deep Creek
Julington/Durbin Creeks
Ortega River
Trout River
Cunningham Creek
Tolomato/Matanzas River Marshes
Nassau River
Pablo Creek
Moultrie Creek
Pellicer Creek
Bulow Creek
Broward River
Dunns Creek (Putnam)
Lofton Creek
Rice/Etonia Creeks
Six Mile Creek
Thomas Creek

Major Lakes

Crescent Lake
Georges Lake
Kingsley Lake
Ocean Pond
Lowry Lake
Rodman Reservoir
Lake George
Lake Disston
Doctors Lake
Lake Geneva

Major Freshwater Wetlands

Okefenokee Swamp
Big Gum Swamp
Pottsburg Creek Swamp
Mud Lake Marsh
Goodson Prairie
Twelve Mile Swamp
Deep Creek Swamp
Pinhook Swamp
New River Swamp
Big Cypress Swamp
Brady Branch Swamp
Rice Creek Swamp
Cabbage Swamp
Fish Swamp
Impassable Bay
Cedar Swamp
Graham Swamp
Long Swamp
Putnam Prairie
Big Island Swamp
Moccasin Swamp
Durbin Swamp
Hull Cypress Swamp
Levy's Prairie
Ashley Prairie
Trestle Bay Swamp

PLANNING AND RESOURCE MANAGEMENT AREAS

Big and Little Talbot Island State Parks
Okefenokee National Wildlife Refuge
Osceola and Ocala National Forests

Wildlife Management Areas

Camp Blanding
Dunns Creek
Guana River
St. Mary's
Bayard Point
Osceola
Ocala
Lake George

Parks

Gold Head Branch State Park
Favor Dykes State Park
Flagler Beach State Recreation Area
Ravine Gardens
Little Talbot Island State Park
Bulow Creek State Park
Anastasia State Park
Washington Oaks
Fort Clinch State Park
Hanna Park
Rodman Reservoir Recreation Area
Guana State Park

NATURAL RESOURCES

Preserves

Osceola National Forest
Okefenokee National Wildlife Refuge
Rollins Bird Sanctuary
Guana River Tract
Jennings State Forest
Punkin Hill CARL Purchase
Swisher Preserve
Ocala National Forest
Cary State Forest
Haw Creek State Preserve
Timucuan Ecological & Historical Preserve
Princess Place Estates
Caravelle Ranch
Northeast Florida Mitigation Park

Aquatic Preserves

Fort Clinch
Nassau/St. Johns
Pellicer Creek
Guana River
Tomoka Marsh

Other Special Feature Sites

Fort Caroline National Monument
Kingsley Plantation
Fort Matanzas National Monument
Huguenot Memorial Park
Castillo de San Marcos
Welaka National Fish Hatchery
Olustee Battlefield
Bulow Plantation
Ft. Mosa Archaeological Site

GROUND WATER RESOURCES

Floridan Aquifer
Floridan Aquifer Recharge Areas

COASTAL AND MARINE RESOURCES

Big and Little Talbot Island
Tolomato/Matanzas River Marshes
Flagler Coastal Greenway
Tomoka Marsh
Gauna/Tolomato/Matanzas National Estuarine Research Reserve

Inlets and Sounds

St. Marys Inlet
Matanzas Inlet
St. Johns Inlet
Nassau Sound
St. Augustine Inlet

Coastal Barrier Resources System

Fort Clinch
Flagler Beach State Recreation Area
Talbot Island Complex
Washington Oaks
Guana River State Park
Anastasia State Park

NATURAL SYSTEMS

Osceola and Ocala National Forests
Cross Florida Greenway (State Owned Portions)
Okefenokee National Wildlife Refuge

Natural Resources of Regional Significance Goals and Policies

Regional Goal 4.1

Improve water quality in surface waters identified as NRRS in the region to meet human and ecosystem needs, and achieve state water quality standards.

REGIONAL INDICATORS

- Elimination of direct discharge of untreated water into surface waters where quality is unacceptable.
- Achievement of applicable state water quality standards.
- Continued support of a regional water quality issues committee.

REGIONAL POLICIES

4.1.1 Utilize water quality data and appropriate biological indicators to design water management practices that facilitate the maintenance or improvement of the existing water quality of the Natural Resources of Regional Significance and their direct tributaries to meet state water quality standards.

4.1.2 To support essential non-withdrawal demands — including navigation, recreation and the protection of fish and wildlife — the discharge of freshwater to Natural Resources of Regional Significance shall be designed to imitate the natural discharges in quality and quantity, as well as in spatial and temporal distribution.

4.1.3 Develop management practices for water resources identified as Natural Resources of Regional Significance and their direct tributaries that consider urban and agricultural non-point sources as well as point sources. Encourage the implementation of these practices by private landowners.

4.1.4 Identify existing and new funding sources to implement best management practices for water resources identified as Natural Resource of Regional Significance.

4.1.5 Maintain the function of wetland NRRS as they relate to the protection of water quality and provide strategic habitat for listed species through the implementation of planning and land management programs.

4.1.6 Continue to support existing and identify additional opportunities for

regional collaborative efforts to address water quality issues including but not limited to the St. Marys River Management Committee, the St. Johns River Lower Basin Water Quality Commission, and the Tolomato-Guana-Matanzas Shellfish Task Force.

4.1.7 Support the Lower St. Johns River Surface Water Improvement and Management (SWIM) program in the region.

4.1.8 Educate and distribute information on surface water resources of the region.

Regional Goal 4.2

Assure an adequate supply of water both in quantity and quality for present and future human, economic development, and ecosystem needs.

REGIONAL INDICATORS

- No stormwater recharge standards or criteria exist for significant aquifer recharge areas within the region (1997).
- Percentage of local governments with adopted wellhead protection ordinances based on scientifically delineated capture zones.
- No prime recharge areas adopted 1996.
- 376.61 mgd of fresh water used by all sources in northeast Florida in 1994.
- 148.7 gallons of water per day per capita withdrawn from all sources in 1994.
- Three (3) counties in the region categorized as water resource caution areas (1995).

REGIONAL POLICIES

4.2.1 Support the implementation of water conservation measures such as:

- utilization of native plant material and communities, including xeriscape practices as a first priority in landscape;
- adoption of measurable water conservation objectives and programs for implementation;
- development and implementation of leak detection programs;
- use of a conservation utility rate structure;
- implementation of water loss prevention programs;

- use of water saving devices and plumbing fixtures, and encourage retrofitting of water saving devices and ultra-low flow fixtures (Standard Plumbing Code);
- discourage the use of potable water for irrigation; and
- utilization of reuse water wherever and whenever possible based upon the economic, ecological and technological factors involved.

4.2.2 Protect public water supply well capture zones from pollution sources which may adversely impact the quality of potable water sources

4.2.3 Assist local governments to identify and protect future well field locations based on future potable water needs identified in adopted comprehensive plans.

4.2.4 Maximize the use of alternative water supplies and conservation measures before consideration of interbasin transfer of water.

4.2.5 Assure that adequate water supplies are identified for projected needs.

4.2.6 Ensure new development is compatible with existing local and regional water supplies and needs.

4.2.7 Identify appropriate measures and land uses which ensure adequate recharge rates for Floridan Aquifer recharge areas and other significant aquifer recharge areas which support identified needs.

4.2.8 Encourage the SJRWMD to identify and adopt prime recharge areas for northeast Florida.

4.2.9 Adopt appropriate measures, including incentives, to protect the recharge functions within prime recharge areas to the Floridan Aquifer once they are designated by the SJRWMD.

4.2.10 Educate and distribute information on the ground water resources of the region.

4.2.11 Support the use of alternative water supplies and conservation strategies in communities experiencing saltwater intrusion.

Regional Goal 4.3

Conserve, and where opportunities exist enhance, the functions of Natural Resources of Regional Significance while protecting private property rights.

REGIONAL INDICATORS

- No coordinated regional greenways plan exists (1997).
- Percent of local governments with an incentive program to protect Natural Resources of Regional Significance.
- 22 greenways in the region 1996.
- Regional data base on Natural Resources of Regional Significance does not exist in 1996.

REGIONAL POLICIES

4.3.1 Maintain the functions of Natural Resources of Regional Significance through the implementation of planning programs and land management programs.

4.3.2 Implement an incentive program that includes methods of land conservation which will encourage land uses compatible with Natural Resources of Regional Significance. Incentives such as:

- conservation easements;
- mitigation banks;
- transferable development rights;
- transferable densities; and
- tax incentives.

Provide technical assistance to local governments, private landowners, and other entities in the implementation of these incentives when developed.

4.3.3 Create a data base of information which will provide, at a minimum, baseline data on the functions, type, size and location of identified Natural Resources of Regional Significance.

4.3.4 Update Natural Resources of Regional Significance maps as new data become available with full public participation and peer review prior to adoption of updates, consistent with the appropriate provisions of Chapter 120, Florida Statutes.

4.3.5 Review development approvals and proposed land use changes for potential adverse impacts to identified Natural Resources of Regional Significance. Maintain the functions of Natural Resources of Regional Significance as a condition of approval or adoption.

4.3.6 Plan and design expansions to the regional transportation system to avoid Natural Resources of Regional Significance as a first option and if not possible, to minimize the adverse impacts to Natural Resources of Regional Significance.

4.3.7 Maps of Natural Resources of Regional Significance shall not be used in isolation and shall only be considered in conjunction with the goals and policies of this SRPP. The Natural Resources of Regional Significance maps are to be used for planning purposes only and as an information source to assist in decision making concerning, land use planning. Site specific data, when available, should be used to identify the extent to which any identified Natural Resource of Regional Significance is present on a site in connection with any comprehensive planning approvals or amendments or any other land use planning decision.

4.3.8 Protect functions of NRRS through actions such as best management practices, public education programs, less than fee acquisition, restoration, and other voluntary and innovative practices.

4.3.9 Increase funds for the acquisition, protection, restoration and maintenance of NRRS in northeast Florida.

4.3.10 Develop a regional greenway system by acquisition of fee, easement or other incentive-based mechanism which connects existing and future public conservation lands; provides for protection and enhancement of natural, cultural, and historical resources; and provides open space for compatible human uses.

4.3.11 Acquire areas designated as NRRS which are not already in public ownership. Consider NRRS in the development of state, regional, and local acquisition programs.

4.3.12 Support the state initiative to implement Ecosystem Management.

4.3.13 Develop partnerships which will efficiently, fairly and effectively implement natural resource protection.

4.3.14 Management polices for public lands shall be consistent with the maintenance of existing ecosystems, restoration of degraded ecosystems, protection of important native communities, and preservation of important historical and archeological sites, where appropriate and consistent with the purpose of the ownership of the public lands.

Regional Goal 4.4

Protect the populations of state and federal listed species within the region.

REGIONAL INDICATORS

- Regional data base of site occurrence data for federal and state listed species and their viable habitat.
- Number of viable populations of threatened and endangered species in the region.
- Increased utilization of public/private partnerships for funding of natural system protection and management.

REGIONAL POLICIES

4.4.1 Planning efforts in the region will be coordinated to protect federal and state listed species by coordination of regional and local planning with federal and state laws and guidelines for protection of such species.

4.4.2 Through the Council's review functions and responsibilities, protect state and federal listed species.

4.4.3 Promote the use of silviculture and agricultural best management practices.

4.4.4 Implement an educational program that will assist private land owners in implementing practices which are compatible with the protection of federal and state listed species and their habitats.

4.4.5 Develop and maintain a regional data base of known site occurrence data for federal and state listed species within the region.

4.4.6 Utilize public, private and other mitigation funds for habitat procurement and enhancement purposes to support viable populations of federal and state listed species.

4.4.7 For all areas identified on NRRS maps as having listed species present on the site, the actual determination of such areas as "Natural Resources of Regional Significance" within the context of the Strategic Regional Policy Plan shall be determined by the actual presence of listed species on such land. The NRRS map designation is indicative that listed species as shown on the map was observed at the site. Any landowner or his designated agent may at any time submit documentaion to the Regional Planning Council and the local government that a particular property does not contain

listed species. Such documentation may consist of (i) surveys of the property which have been conducted using methods generally approved by the Florida Game and Fresh Water Fish Commission or the U.S. Fish and Wildlife Service for those listed species shown as potentially present on the property; (ii) demonstration that no habitat is present on the property which supports the listed species shown as potentially present on the property; or (iii) similar demonstration that no such species are present on the site. The Regional Planning Council or affected local government shall thereafter take appropriate steps to amend the NRRS map and any local government comprehensive plan, if applicable, to delete those areas if such documentation has been adequately demonstrated through peer review.

4.4.8 Threatened and endangered species and their habitats shall be protected, at a minimum, consistent with guidelines issued by appropriate state, federal and regional agencies.

4.4.9 Protect species of special concern where those species are actually present, consistent, at a minimum, with guidelines issued by appropriate state, federal, and regional agencies.

4.4.10 Management polices for public lands shall enhance and expand the habitat values provided for listed species where they are appropriate and consistent with the purpose of the ownership of the public lands.

4.4.11 Encourage protection of listed species and their habitat through the use of incentives such as:

- Conservation easements;
- On and off-site mitigation banks;
- Tax breaks;
- Transferable densities or density bonuses;
- Management agreements; and
- Best management practices.

4.4.12 Maintain a data base of agencies and their issued guidelines for the protection of listed species, and provide to local governments and landowners these data when requested.

4.4.13 Review existing and new species data, at a minimum, annually for consideration of updating of maps through the rule amendment process.

Regional Goal 4.5

Protect the functions provided by beaches, dunes and estuaries as they relate to habitat, storm protection and economic values afforded by these areas.

REGIONAL INDICATORS

- Completion of an inventory of undeveloped coastal areas within the region.
- Percent of local governments with shoreline protection ordinances.
- Number of acres of coastal areas either in public ownership or in some other type of long-term conservation/protection status.
- 2,585 acres of shellfish harvesting beds were classified as Conditionally Approved in March 1997.

REGIONAL POLICIES

4.5.1 Inventory, identify and accelerate acquisition of existing undeveloped beach, dune and estuary areas which provide significant resource values and storm protection values.

4.5.2 Encourage the restoration of damaged dune systems. Provide technical assistance to local governments in the development and implementation of Dune Reconstruction Plans.

4.5.3 Protect the primary dune systems of the region. Provide technical assistance to local governments in the development and implementation of dune protection plans.

4.5.4 Public access to the region's beaches shall be provided in a manner that meets identified recreational needs and that provides for the protection of dune and beach systems.

4.5.5 Increase public awareness of the resource and economic value of the region's coastal, estuary and marine resources.

4.5.6 Support community programs to protect sea turtles and their nests on the region's beaches.

4.5.7 Support the continuation and expansion of the Gauna/Tolomato/Matanzas National Estuarine Research Reserve.

4.5.8 Protect and promote restoration of natural estuarine cycles and the long-term productivity of marine fisheries habitat.

4.5.9 Achieve water quality that will support the designated use of Class III waters as classified by the state.

4.5.10 Identify, inventory and prioritize for acquisition purposes existing undeveloped areas along estuaries which provide significant benefit and protection to NRRS.

4.5.11 Assist in the completion of local manatee protection plans and the education of the public in the preservation of this species.

4.5.12 Discourage the expenditure of public funds that subsidize development in high-hazard coastal areas.

ENDNOTES

[1] Milsap, et al, 1990.

[2] Florida Department of Environmental Protection, Strategic Assessment of Florida's Environment, 1994.

[3] Closing the Gaps in Florida's Wildlife Habitat Conservation System.

[4] 1994 Department Environmental Protection 305B Report.

[5] 1994 305B Report.

[6] Florida Marine Research Publication #45, Assessment of Fisheries Habitat: Northeast Florida.

[7] Beginning Ecosystem Management, Florida Department of Environmental Regulation.

[8] Closing the Gaps In Florida Wildlife Habitat Conservation System.

[9] Special Management Areas Program, June 1993. City of Jacksonville Planning and Development Department.

[10] Creating a Statewide Greenways System, Florida Greenways Commission, Report to the Governor, December 1994.

[11] Northeast Florida Regional Planning Council, *Population Regional Atlas*, May 1994.

[12] Florida Department of Natural Resources, Florida Marine Research Publications No. 45, *Assessment of Fisheries Habitat: Northeast Florida*, July 1988.

[13] Telephone interview. David Schimdt, Chief of Coastal Division, U.S. Army Corps of Engineers, Jacksonville office, 13 November 1995.

[14] Florida Department of Agriculture and Consumer Services, *Florida Agriculture Facts*, 1993 Release.

[15] State of Florida, State Air Implementation Plan, Redesignation Request and Attainment/ Maintenance Plan for the Duval County Ozone Nonattainment Area, August 1994.

NATURAL RESOURCES MAPS

(To view maps, go back to the Strategic Regional Policy Plan listing and click on individual map listings under "Natural Resources of Regional Significance")