

CHAPTER 8

ST. LUCIE COUNTY COMPREHENSIVE PLAN

CONSERVATION ELEMENT

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**ST. LUCIE COUNTY
CONSERVATION ELEMENT**

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CONSERVATION ELEMENT ST. LUCIE COUNTY

INTRODUCTION

The purpose of the Conservation Element is to promote the conservation, appropriate use and protection of the large variety of natural resources within St. Lucie County. The Goals, Objectives and Policies are designed to establish the long-term course of action and implementation activities for conservation programs throughout the County.

St. Lucie County is located along the upper reaches of Florida's southeast coast. The County comprises approximately 600 square miles in area, with approximately 500 square miles within the unincorporated areas under the authority of the St. Lucie Board of County Commissioners. The balance of the County consists of the incorporated municipalities of Ft. Pierce, Port St. Lucie, and St. Lucie Village.

The Treasure Coast Regional Planning Council estimates that historical wetlands covered about 51 percent of the County and uplands covered the remaining 49 percent of the County. The most recent estimates of land use cover for St. Lucie County indicates that agricultural now accounts for about 53 percent of land cover, urban development 21 percent, wetlands 7 percent, and upland natural communities 19 percent (Treasure Coast Regional Planning Council, 1995).

The estimated 1999 Countywide population was 186,905, the unincorporated area population for the same time period was 64,640. By the year 2020, the Countywide permanent population is projected to increase to 295,773. This represents a 58% increase over the 21 year period. As development pressures increase, effective resource protection measures are critical to maintain the functions and values of the remaining natural areas, and to maintain and improve the quality of life for all residents and visitors to St. Lucie County.

INVENTORY AND ANALYSIS OF NATURAL RESOURCES

St. Lucie County still contains a mosaic of upland and wetland natural features and the diverse wildlife associated with the areas natural communities (Figure 8-1). In 1992, KBN Engineering and Applied Sciences released a detailed report commissioned by St. Lucie County entitled *Wetland and Upland Habitat Inventory: St. Lucie County*. This study estimated the 1991 acreage of each Florida Natural Areas Inventory community in St. Lucie County. The study identified 80,358 acres of native habitat within St. Lucie County consisting of 50,018 upland acres and 30,340 wetland acres, over 9,000 acres of these natural communities were on state and private preserves. Since that time almost 8,000 additional acres have been placed in public ownership.

The wetland and upland inventory also evaluated the loss of natural areas between 1986-1991. The study identified a 19.3 percent loss of the county's native communities within the five year time frame. The continuation of this rate of loss could quickly decimate the County remaining natural resources. Maintaining the overall ecological integrity of the County's most important natural resources will require protecting and preserving native habitats, encouraging proper management, enhancement, and restoration of ecologically functional natural areas throughout the County.

A. WATER RESOURCES

The Florida Administrative Code names the 305(b) report as a primary source of water quality assessment information. The information compiled in the 305(b) report has been used to select SWIM priority waters, develop ecosystem management area plans and to meet the Clear Water Act [Section 303(d)] requirement to assess the quality of navigable water and report the results to Environmental Protection Agency. The 1996 Water Quality Assessment for the State of Florida Section 305(b) Report and follow-up 1998 303(d) Report, and the Florida Department of Environmental Protection's Ecosummaries were used for the water quality component of this element. Figure 8-2 depicts the water quality classification of St. Lucie County surface waters.

There are several areas within the county that are classified as Outstanding Florida Waters (Figure 8-2). These waters are within the:

- * Ft. Pierce Inlet State Recreation Area;
- * Indian River Aquatic Preserve - Vero Beach to Ft. Pierce;
- * Indian River Aquatic Preserve - Ft. Pierce to Jupiter Inlet;
- * North Fork, St. Lucie Aquatic Preserve; and
- * Savannas State Reserve.

Outstanding Florida Waters (OFW) are waterbody's with special protection due to its natural attributes (403.061 FS). The intent of an Outstanding Florida Waters designation is to maintain ambient water quality, even if these designations are more protective than those required for the classification of the individual waterbody. Most OFWs are located within the state or federal park system, such as aquatic preserves, estuaries, national seashores, or wildlife refuges.

1. Surface Waters

a. Indian River Lagoon:

The Indian River Lagoon, an Estuary of National Significance, is recognized as the most productive and diverse estuary in North America, with more than 4,300 species of animals and plants. The brackish body of water, is a system of three interconnected estuarine lagoons situated between the mainland portion of a six county region and a series of low barrier islands that front the Atlantic Ocean. Along the eastern shore of the lagoon, within St. Lucie County, lie North and South Hutchinson Islands; two low coastal barrier islands. Slopes along the island are very gradual. There are dense mangrove swamps and many small islands and bays such as Big Starvation Cove, St. Lucie Cut, Wildcat Cove, Bear Point Cove, Middle Cove, Blind Creek, Big Mud Creek, and Herman's Bay.

Most of the Indian River Lagoon has been designated an Aquatic Preserve by the State of Florida (Figure 8-3). In St. Lucie County, the Aquatic Preserve extends from the southern limits of the City of Vero Beach in Indian River County to the Jupiter Inlet in northern Palm Beach County, exclusive of an area within the municipal limits of Ft. Pierce [Chapter 258.39(8) and (9), Florida Statutes]. In 1995, the Indian River Lagoon Nation Estuary Program prepared and adopted the Comprehensive Conservation and Management Plan for the Indian River Lagoon to further protect the ecosystem. The specifics of this management plan are reviewed in greater detail in the Coastal Management Element.

Figure 8-1. Wetland and upland vegetative communities in the unincorporated areas of St. Lucie County (South Florida Water Management District, Land Use and Land Cover data, 1986).

Figure 8-2 Water Quality Classifications

Figure 8-3 Indian River Aquatic Preserve

The natural watershed of the Indian River Lagoon has been significantly enlarged. Historically, the western portions of the County did not drain into the lagoon under normal conditions. Over the years however, extensive drainage systems have been installed which discharge either directly into the Lagoon at Taylor Creek, or into the North Fork of the St. Lucie River which ultimately reaches the Indian River Lagoon, via the St. Lucie Estuary. Although effective, these drainage improvements have greatly enlarged the drainage basin boundaries of the lagoon and affected the lagoons natural balance. Drainage modifications and land use intensification in the watershed have dramatically increased wet-season flows to the Indian River Lagoon and significantly reduced dry-season inflows. Dry-season inflows to the estuary are reduced due to the storage of water in the canal systems and the reduction in groundwater flows caused by lower groundwater tables (St. Lucie River Issue Team, 1998).

The 1996 Water Quality Assessment for the State of Florida 305(b) reported the water quality of the Indian River Lagoon as generally good, especially south of the City of Fort Pierce. At Ft. Pierce, the lagoon receives nutrients and excess freshwater from C-25 Canal and Moore's Creek, which drain citrus groves, rangeland and urban areas (Hand, 1996). In southern St. Lucie County, the Indian River Lagoon receives nutrients and excess freshwater from urban runoff and the St. Lucie Estuary which receives waters from the North Fork of the St. Lucie River and major drainage canals, C-23, C-24, and C-44 Canals. The development of these secondary canals that drain urban and agricultural lands within the St. Lucie River watershed is most often responsible for changing the quantity and quality of flows to the St. Lucie Estuary and Indian River Lagoon (St. Lucie River Issue Team, 1998).

b. North Fork of The St. Lucie River:

The North Fork of the St. Lucie River is a Blackwater Stream flowing 16 miles south where it widens into the tidal embayment known as the St. Lucie Estuary in Martin County (Graves, Ecosummaries: North Fork of the St. Lucie River and St. Lucie Estuary, 1997). The St. Lucie River receives water from Five Mile and Ten Mile Creeks and three major canals, the C-23, C-24, and the C-44 Canal, prior to reaching the St. Lucie Estuary and, ultimately, the Atlantic Ocean through the St. Lucie Inlet. Although the C-44 Canal is not within St. Lucie County, it does effect the quality of the North Fork of the St. Lucie River.

Within the Indian River Lagoon Aquatic Preserve, virtually the entire length of the North Fork and its natural tributaries, Five and Ten Mile Creeks, were channelized in the early 1900's to increase drainage in its upper reaches. Oxbows cutoff from the river and spoil banks along its shoreline result from the channelization of the river. Still, the river contains a complex of hardwood swamp, mesic pine flatwood and scrub communities along a riverine corridor meandering through the urbanized area of the City of Port St. Lucie. The Floodplain of the North Fork of the St. Lucie River is a fairly pristine natural resource made up of wetlands which not only provide high quality wildlife habitat but also valuable storage of flood waters.

In 1972, the Florida Trustees of the Internal Improvement Trust Fund recognized the importance of the North Fork of the St. Lucie River by designating it an Aquatic Preserve and Outstanding Florida Waters (OFW). These lands represent an exceptional area of submerged lands set aside to protect their biological, aesthetic, and scientific value. The river basin sustains a variety of fish and wildlife, including the West Indian manatee, bald eagle, wood stork, and eastern indigo snake. Approximately 1,500 acres along the shoreline of the North Fork of the St. Lucie River and its natural tributaries have been purchased to protect the river and adjacent uplands. Another 1,500 acres are targeted for purchase through the Conservation and Recreational Lands program and the County's Environmentally Significant Lands program. Access to the North Fork of the St. Lucie River is provided by several local parks with boat ramps, as well as the County's Environmentally Significant Land (ESL) properties and the Florida Department of Environmental Protection North Fork of the St. Lucie River Buffer Preserve lands.

Figure 8-4. WETLAND AREAS OF COUNTY

In 1996, the Florida Department of Environmental Protection Water Quality Assessment reported the North Fork of the St. Lucie River quality as poor and not supporting its designated use as a Class III waterway. The assessment noted that major problems are within the river's major tributaries, Five Mile and Ten Mile Creeks, which receive citrus grove runoff and have poor water quality with high pesticide levels that may be harming the North Fork of the St. Lucie River and Estuary (Hand, Water-Quality Assessment for the State of Florida, 1996).

The report noted that the North Fork's water quality improves downstream of the confluence of Five Mile and Ten Mile Creeks but is still affected by stormwater runoff from urban development along the river's shoreline (Hand, Water-Quality Assessment for the State of Florida, 1996). The City of Port St. Lucie is currently implementing a large scale, central water and sewer project which will reduce the number of septic tanks and the County is implementing several stormwater treatment projects to improve the quality of water reaching the North Fork of the St. Lucie River.

c. Savannas:

The Savannas are one of the best quality freshwater wetland systems remaining in southeast Florida. The Savannas are located west of the Atlantic Coastal Ridge, extending north and south of Ft. Pierce. Originally, the Savannas formed a continuous system which stretched the length of the County. That system was disrupted by the construction within the City of Ft. Pierce and the introduction of associated drainage activities.

North of the City of Ft. Pierce, approximately 1,400 acres of the historic freshwater wetland ecosystem remains. Since 1995, 278 acres of the North Savannas ecosystem has been purchased through the County's Environmentally Significant Lands program and another 715 acres has been targeted for protection through public acquisition. The 278 acre tract is contiguous to a 65 acre County owned recreation site and approximately 350 acres of the North Savannas ecosystem on the eastern edge of the St. Lucie International Airport site. This portion of the airport has been proposed for preservation to meet the airport's mitigation requirements, however, preservation has not been formalized. Public ownership and restoration of these lands will be a major step toward protecting an ecological greenway linking the North and South Savannas via the Indian River Lagoon.

The South Savannas is a 15 mile long freshwater marsh between Ft. Pierce and Stuart and is designated a Class III water body, fully meeting its intended use. A 5,000 acre, ten mile long corridor of the South Savannas ecosystem is within the Savannas State Reserve which was purchased through the State of Florida's Conservation and Recreational Lands (CARL) program to protect the Reserve lands. When completed, the state purchases will total about 6,000 acres. The Savannas State Reserve has been noted as "the best remaining segment of Florida's east coast savannas" and contains valuable upland and wetland habitat for listed species, including the endangered scrub community that supports the Florida scrub-jay (Graves, Stormwater Impact on the Savannas State Reserve, 1997). Another 504 acres of the South Savannas ecosystem, located north of the State Reserve, is owned by the City of Fort Pierce and managed by St. Lucie County as the Savannas Recreation Area. The County is seeking funds to purchase the remaining Atlantic Coastal Ridge scrub and associated wetlands that border the Savannas Recreation Area.

d. Cypress Creek:

Cypress Creek is a blackwater stream system originating in Okeechobee County and flowing easterly into St. Lucie County and south across SR 70 (Okeechobee Road) into a large cypress basin. The mixed forested wetlands are found both north and south of State Road 70 including areas around Cow Creek and Cypress Creek. This area includes one of the largest and highest-quality portions remaining of a complex of cypress swamps, hydric hammock, and marshes that once extended from the upper St. Johns River basin through the Allapatta Flats to the St. Lucie River basin (FDEP, Cypress Creek/Trail Ridge Project Assessment, 1997). Up until 20 years ago, the creek flowed naturally to the south-southeast creating a large complex of Hydric Hammock, Basin Swamps and Floodplain Swamps developed on the floodplain of the Creek south of State Road 70. The waters of Cypress Creek and contiguous wetlands are Class III waters of the State (FDEP, Cypress Creek/Trail Ridge Project

Assessment, 1997).

Almost 10,000 acres within the Cypress Creek basin area has been targeted for purchased by several agencies including, the South Florida Water Management District, the Department of Environmental Protection, the Department of Interior, and St. Lucie County. Lands within the Cypress Creek basin are also proposed as natural water preserve areas within the draft Indian River Lagoon Implementation Plan.

e. Canal Systems:

The County has three major drainage and flood control canals, C-23, C-24, and C-25 Canals which are part of the Central and South Florida Flood Control project and managed by the South Florida Water Management District. In addition, the Ft. Pierce Farms Water Control District and the St. Lucie River Water Control District manage secondary canal systems. These canals are solely dependent on rainfall as a source of inflow and are important sources of agricultural irrigation water (SFWMD, Water Supply Plan, 1998). Currently permitted for maximum allocation, no further withdrawal permits are being issued from these secondary canal systems.. All but a small area in southwestern and northeastern St. Lucie County is drained by primary and secondary canal systems.

Canals C-23 , C-24 and the North Fork of the St. Lucie River Water Control District canals drain into the North Fork of the St. Lucie River and its major tributaries. The C-25 Canal and Ft. Pierce Farms Water Control District (Basin 1) canals empty directly into the Indian River lagoon nearly opposite the Fort Pierce Inlet. This Canal carries a greater volume of water than the other major upper east coast drainage canals, including C-44 (Graves, Ecosummary: SFWMD Canal C-25, 1998). The section of the lagoon currently impacted by discharges from C-25 is one of the best remaining segments of the lagoon, and includes the only open shellfish harvesting area in the southern Indian River (Graves, Ecosummary: SFWMD Canal C-25, 1998).

f. Wetlands:

St. Lucie County has a variety and abundance of freshwater and estuarine wetlands (Figure 8-4). The latter are primarily mangrove forests along the Indian River Lagoon shoreline and southern reach of the North Fork of the St. Lucie River. Most of the lagoonal wetlands have been impounded to assist mosquito control activities; other uses include recreation (parks) and conservation (open space), as well as research.

The major problems over the years have been the elimination of tidal exchange upon construction of impoundment dikes; and loss of wildlife habitat, water recharge areas, stormwater filtering capability, and flood water storage areas from dredge and fill activities to create uplands and associated stormwater management facilities. The lagoonal wetlands that were impounded to assist mosquito control activities are gradually being reconnected to the lagoon to allow tidal exchanges to provide more productive ecosystem. Freshwater wetlands are scattered throughout the county.

One of the largest contiguous areas is found in the Savannas State Reserve. The Savannas State Reserve includes approximately 5,000 acres of uplands and wetlands extending ten miles, from Fort Pierce to Jensen Beach in St. Lucie and Martin Counties. These lands were purchased through the State Conservation and Recreation Lands Program and are managed by the Florida Department of Environmental Protection for conservation and recreation. North of the City of Ft. Pierce, a 1,400 acre marshy swale bordered by scrub and flatwood uplands represents the northern extent of the historic freshwater marsh. The County owns and manages 343 acres of the North Savannas ecosystem, 278 acres were purchased through its Environmentally Significant Lands program.

The other large contiguous natural wetland systems east of the I-95 - Turnpike Corridor exist along the North Fork of the St. Lucie River, Five Mile Creek, and Ten Mile Creek. Wetland systems west of I-95, in the county's agricultural areas, include wet prairies and depressional marshes as well as Basin Swamp and Baygall communities.

2. Surface Water Quality Concerns

Habitat loss and reduced species diversity are believed to be caused by land use changes, development and agricultural practices that impact surface waters. Continued loading of the Indian River Lagoon by suspended matter and nutrients threaten to transform the seagrass-driven system to a phytoplankton-based system. This has the potential to damage existing estuarine resources within the lagoon. Although only a small percentage of development occurs along the Lagoon's shoreline, nearly all the recharge water in the Surficial Aquifer system, as well as stormwater runoff, eventually discharge eastward into the Indian River Lagoon from natural and constructed drainage systems (Moses, Septic Tank Study for St. Lucie County, 1993).

In 1998, the Florida Department of Environmental Protection released the 303(d) list required under the Clean Water Act. The 303(d) list includes waters not meeting water quality standards or not supporting their designated uses. The North Fork of the St. Lucie River, Ten Mile Creek, C-24 and C-25 Canals were listed as impaired water bodies. Nutrients and dissolved oxygen were parameters of concern in all of these water bodies.

The St. Lucie River Watershed, which includes the North Fork of the St. Lucie River basin, is a high priority area for protection under the Surface Water Improvement and Management program. The St. Lucie River Watershed includes all of St. Lucie County except the extreme northeast and southeast areas. There is a growing concern over the pollution entering the County's waterways from urban runoff and drainage from canal systems which carry large quantities of runoff from agricultural areas. Particularly, the North Fork of the St. Lucie River and its tributaries, which receive excess runoff from increased urban development and nutrients and excess freshwater from canal systems that drain the western agricultural areas (Janicki, St. Lucie Watershed Assessment, 1999).

Water quality problems in the North Fork of the St. Lucie River basin have primarily been attributed to Ten Mile Creek, the major tributary to the North Fork of the St. Lucie River. In response to an extensive fish kill in 1994 and pesticides revealed through the Florida Department of Environmental Protection Southeast District Surface Water Ambient Monitoring program, additional water samples in the Ten Mile Creek basin were collected and analyzed. In June 1995, the results of Ten Mile Creek water quality analysis were reported in an Ecosystem Management Report entitled *Pesticide Contamination in Ten Mile Creek*. Fourteen different pesticides were detected in Ten Mile Creek, several exceeding State water quality standards, three pesticides were the highest concentrations ever detected in Florida. The contamination and resultant biological impairment documented a loss of Class III function for Ten Mile Creek waters. The study also confirmed pesticide contamination in the OFW by detection of pesticides in the northern end of the North Fork of the St. Lucie River Aquatic Preserve. These pesticides are related to extensive citrus farming in the Ten Mile Creek basin (Graves, Pesticide Contamination in Ten Mile Creek, 1995).

The primary concern in the C-25 Canal system is the transport of pesticides and heavy metals into the estuary. Ft. Pierce Farms Water Control District Canal #1 and the C-25 Canal merge prior to discharge to Taylor Creek (Florida Department of Environmental Protection, 2000). Water quality samples of phosphorous and nitrogen from Ft. Pierce Farms Canal indicate values about twice what was observed in the C-25 Canal, and are similar to C-23 and C-24 Canals which discharge into the impaired St. Lucie Estuary (Florida Department of Environmental Protection, Ecosummary: Ft. Pierce Farms WCD Canal #1, 2000). Samples of sediments from the Ft. Pierce Farms Canal contain the highest concentrations of heavy metal copper and the pesticide ethion ever detected in the southern portion of the Indian River Lagoon (Florida Department of Environmental Protection, Ecosummary: Ft. Pierce Farms WCD Canal #1, 2000). Because the C-25 canal is located at the mouth of the Ft. Pierce inlet, during outgoing tide, freshwater exits the inlet taking with it contaminants as well as floating vegetation (Graves, South Florida Water Management District Canal C-25, 1998).

The C-23 and C-24 Canals drain into the North Fork of the St. Lucie River in southern St. Lucie County. The C-24 Canal basin was identified in the Indian River Lagoon Swim Plan (1994) as a specific problem area because of the area's heavy agricultural uses and the amount of herbicide and pesticide chemicals found in the North Fork of the St. Lucie River. Water quality studies of the C-23 and C-24 Canals have detected several pesticides in canal waters, however, only ethion was detected at concentrations exceeding Class III standards.

Pesticides have been detected in all the County's major canal systems and the North Fork of the St. Lucie River Aquatic Preserve. Pesticides can cause contamination of water and injury to plants and animals that were not the target of pesticides (EPA, Office of Pesticide Programs, 1999). Ethion is a pesticide commonly used in the citrus industry in Florida and has been detected in all the County's major canals systems as well as the North Fork of the St. Lucie River (EPA, Office of Pesticide Programs 1999; Graves, Ecosummaries:1997-2000). Ethion is highly toxic to freshwater and marine fish as well as freshwater invertebrates, and poses a moderate to low risk for terrestrial animals (EPA, Office of Pesticide Programs, 1999).

A major problem in the southern reach of the North Fork of the St. Lucie River and Indian River Lagoon has been the large release of freshwater from Lake Okeechobee through the C-44 Canal into the St. Lucie Estuary in Martin County. Large fish kills in the St. Lucie Estuary, of the St. Lucie River in 1998 has been associated with the large releases of freshwater from Lake Okeechobee through the C- 44 Canal (Florida Fish and Wildlife Conservation Commission, Fish Health in the St. Lucie Estuary, 2000). These large freshwater releases from Lake Okeechobee also result in fish kills in the Indian River Lagoon and the North Fork of the St. Lucie River. It is likely that the lower salinity water from Lake Okeechobee releases and associated increased color and turbidity also reduced seagrass growth in the Indian River Lagoon in southern St. Lucie County (St. Lucie River Issue Team, Interim Report, 1998). The Florida Marine Research Institute continues to monitor fish kills and abnormalities in the North Fork of the St. Lucie River and Indian River Lagoon. Although not attributed to Lake Okeechobee releases, during 2000, six cases of fish kills or fish with abnormalities were reported in the North Fork of the St. Lucie River, south of the C-24 Canal and two cases were reported in the Indian River Lagoon in southern St. Lucie County.

Although the Savannas State Reserve has fairly good water quality, other environmental problems are present (Hand, Water Quality Assessment of the State of Florida, 1996). Historically, nearly all the water entering the Savannas Marsh was from rainfall. The marsh system was so pure, the introduction of even small amounts of pollution had drastic results. Beginning in the 1950's residential development west of the Savannas began to achieve drainage and flood control by discharging runoff directly into the Savannas without treatment. Stormwater runoff carries a high concentration of phosphorus which promotes plant growth which alters the unique character of the Savannas marsh ecosystem.

3. Floodplain

Figure 8-5 depicts the flood hazard boundaries within the unincorporated areas of the County as prepared by the Federal Emergency Management Agency. Areas subject to flooding during the 100-year flood (Zone A) occur along the coastline of the Atlantic Ocean, along both sides of the Indian River Lagoon, in the Savannas, and along the North Fork of the St. Lucie River and its major tributaries. There are a few smaller areas subject to the 100-year flood in isolated low areas, especially near the coast. Areas of 100-year coastal flood with wave action (Zone V) extend into the Indian River Lagoon along its western side. Riverine flooding occurs when the flow of rainwater runoff exceeds the carrying capacities of the natural drainage systems. During extended periods of heavy rainfall, certain low-lying neighborhoods within the county are subject to considerable flood damage caused by the inability of natural and mechanical drainage systems to

Figure 8-5. St. Lucie County - Generalized 100 Year Floodplain

effectively remove the water.

The North Fork of the St. Lucie River contains an extensive floodplain, with a significant portion of its floodplain completely or partially isolated from the river's main branch. (Dames and Moore, USACOE Section 1135 Project Feasibility Study: North Fork of the St. Lucie River, 1996). Approximately 1,600 acres of the floodplain and adjacent uplands along the North Fork and its major tributaries, Ten Mile and Five Mile Creeks, are in public ownership. An additional 1,500 acres along the North Fork of the St. Lucie River are targeted for acquisition by state and local environmental land acquisition programs. Preservation and restoration of the river's natural floodplain will enhance the flood protection functions of the river.

4. Groundwaters

The County's water needs are met by both the Surficial Aquifer System and the Floridan Aquifer System. The Surficial Aquifer system is the major source of potable water in St. Lucie County. Yields from the Surficial Aquifer are low and water quality is fair. Problems with water quality are usually associated with excess iron, and hardness, but high chloride content can also be a problem where abandoned Floridan wells have contaminated the Surficial Aquifer (SFWMD, Districtwide Water Supply Assessment, 1998).

The Floridan Aquifer system is primarily used as a backup source of agriculture irrigation water when rainfall is low and surface water from the major canals is not available (SFWMD, Districtwide Water Supply Assessment, 1998). Its quality is considered low with high concentrations of dissolved salts. Grove managers and ranchers tend to mix the water from the Floridan wells with surface water and ground water from the better quality Surficial Aquifer System (SFWMD, Upper East Coast Water Supply Plan, 1998). This dilutes the brackish Floridan water to a level acceptable for citrus irrigation, allowing growers to augment their surface water supplies when the canals are low.

5. Demand for Water

St. Lucie County is a major agricultural area with citrus being the dominant crop with significant water demands. In recent years, the coastal area has experienced rapid urban development, which has given rise to increasing public utility and self-supplied water demand. The following table depicts water 2020 water supply demands projected for domestic, industrial/commercial and agricultural uses. Total demands between 1995 and 2020 are projected to increase by 17 percent. Urban demands are projected to grow by 74% between 1995 and 2020, and agricultural demands are projected to rise by 8 percent during that period (SFWMD, Districtwide Water Supply Assessment, 1998).

TABLE 8-1 St. Lucie County Water Use and Projected Demands							
Urban and Agricultural Demands	1990 Use (MGY)	% of Total	1995 Assessed (MGY)	% of Total	2020 Assessed (MGY)	% of Total	% Change 1990-2020
Public Supply	5,300	5.7%	5,121	4.09%	11,665	7.9%	120.1%
Domestic Self Supply	4,300	4.7%	3,325	2.66%	3,245	2.21%	-24.5%
Industrial/Commercial	300	0.3%	1,862	1.49%	3,008	2.05%	902.7%

TABLE 8-1 St. Lucie County Water Use and Projected Demands							
Urban and Agricultural Demands	1990 Use (MGY)	% of Total	1995 Assessed (MGY)	% of Total	2020 Assessed (MGY)	% of Total	% Change 1990-2020
Recreation Self Supply	2,600	2.8%	7,225	5.77%	12,668	8.6%	387.2%
Agricultural	79,900	86.5%	107,354	85.78%	116,384	79.19%	45.66%
Total	92,400		125,157		146,970		59.1%
SFWMD - April 1995, July 1998							

The Upper East Coast Water Supply Plan concludes that the surficial aquifer system in the coastal portion of the region is not sufficient to meet projected water demands. The plan states that the Floridan Aquifer is the most promising source for future urban potable water needs, and has sufficient supplies to meet future urban and agricultural demands (SFWMD, Districtwide Water Supply Assessment, 1998). Aquifer Storage and Recovery technology is a potential means of storing water in aquifers for future use. Water quality, particularly regarding untreated surface water limits the ability to currently use Aquifer Storage and Recovery (Comprehensive Everglades Restoration Plan (CERP), Appendix D, 1999). Water recovered from the Aquifer Storage and Recovery system may not have the appropriate quality for its intended use. A pilot study for large-scale Aquifer Storage and Recovery system is being implemented through the Comprehensive Everglades study. Several issues are to be addressed including environmental and health concerns regarding water quality (CERP, Appendix D, 1999).

6. Groundwater Quality Concerns

The Surficial Aquifer Systems is easily contaminated by activities occurring at the lands surface (SFWMD, Upper East Coast Water Supply Plan, 1998). Improper disposal or accidental spills of even small amounts of hazardous substances can contaminate large quantities of groundwater in a relatively short time.

The St. Lucie County Health Department Environmental Health section permits and monitors various projects with environmental risk to underground water supplies. Potential groundwater contaminants sources include landfills, petroleum storage tanks, on-site sewage disposal systems, hazardous material storage tanks, and industrial waste sites (SFWMD, Upper East Coast Water Supply Plan, 1998).

St. Lucie County is designated as part of the South Florida Water Management District's Critical Water Supply Problem area, with some areas designated as a Reduced Threshold Area, and a Restricted Allocation Area. These designations are given to geographic areas where water resource supply problems are critical, or are expected to become critical.

The Upper East Coast Water Supply Plan identified several potential water problems projected to occur by 2020. Within St. Lucie County, areas along the Indian River Lagoon shoreline and the North Fork of the St. Lucie River shorelines were identified as potential areas for saltwater intrusion. (South Florida Water Management District, 1998). A summary of Water Supply Issues for St. Lucie County are shown below:

INLAND ISSUES	COASTAL ISSUES
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Surface water availability	Cumulative impacts (wetlands)
Floridian water quality	Saltwater intrusion vulnerability
Watershed management - discharges to the IRL and SLE	Watershed management - discharges to the IRL and SLE

Source: Upper East Coast Water Supply Plan, Chapter 5, 1998

B. AIR

The Florida Department of Environmental Protection provides the measurements of ambient air quality and provides monitoring throughout the state. Legal limitations on pollutant concentration levels of ambient air have been established for six pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide (FDEP, Air Quality Report, 1999).

Currently, there are two sites in St. Lucie County that are part of the State/Local Air Monitoring Station Network. The Florida Department of Environmental Protection maintains a monitoring station at 101 Rock Road where ozone, particulate matter, and nitrogen oxide are monitored and a particulate matter monitoring station at the St. Lucie County Landfill on Glades Cut-Off Road (FDEP, Air Quality Report, 1999).

The 1999 Air Quality Report, published by the Florida Department of Environmental Protection, reported no exceedances of ambient air quality standards within the County. In 1998, one exceedance of the 8-hour Ozone concentration was detected. Ozone is not emitted directly into the atmosphere but results from a series of reactions between nitrogen oxides and volatile organic compounds. Nitrogen oxides are emitted primarily from high-temperature combustion sources such as power plants. Volatile Organic Compounds are emitted primarily from motor vehicles, but may arise from the evaporation of gasoline and solvents (FDEP, Air Quality Report, 1999).

C. SOILS

The Soil Conservation Service issued the St. Lucie County Soil Survey in 1980. This survey contains maps covering virtually all of the land areas of the County at a scale of 1:20,000. In addition, the County has a database of soil classifications within 10-acre grid cells. Figure 8-6 presents a general soil map of St. Lucie County which shows broad areas of soils, relief and drainage. The general soil map can be used to compare the suitability of large areas for general land uses.

Sand is the predominant soil texture (in relation to silt and clay) within the upper horizons for most of the soils. Loamy soils (sand with silt and clay) are more prevalent in lower horizons. Several soils are predominantly muck in the upper horizons. Most of the major soil groups found in the County have severe limitations for development activities including excavation, dwellings and small commercial buildings, roads and streets, drainage, septic tank absorption fields, and sewage lagoon areas. These limitations are due to slope, wetness, cutback caves, seepage, slow percolation, cemented pan, ponding, excess humus, floods, subsidence, and low strength. Even with proper site modification, some limitations cannot be overcome and additional site development usually includes fill.

D. MINERALS

Sand and shell rock mining generally occurs within or near the Atlantic Coastal Ridge and in the western parts of the County. There are currently thirteen mining operations active in St. Lucie County. Four of these operations mine coquina and nine mine sand. Because of the abundance of fill materials in Florida and the cost of

transporting them, they are only valuable on a large scale and are generally mined near the site of their eventual disposition. One exception is the mining of silica sand which is shipped to the Bahamas from the Port of Ft. Pierce. Figure 8-7 shows the locations of mining operations in St. Lucie County.

E. FISHERIES

The ichthyofauna community of the Indian River Lagoon complex is recognized as the most diverse of United States waters with more than 600 species having been identified. The reasons for this diversity are many. The Lagoon spans several biogeographic provinces and has both a tropical and temperate influence. The Lagoon complex also has a high diversity of habitats including tidal inlets, sand bottoms, seagrass meadows, and adjacent mangrove forests and freshwater creeks. A higher diversity in the southern portion of the Lagoon has been ascribed to greater abundance of inlets, presence of reef-like habitats not present in the north, and greater tropical representation (Woodward-Clyde, Indian River Lagoon National Estuary Plan, 1994).

The surface waters of St. Lucie County support a wide variety of fish species which are valuable resources for both commercial and sport fishing. The bay anchovy has been reported as the most numerically abundant fish in the Lagoon, while the pinfish is the most abundant species in the important seagrass habitat. Red drum, spotted seatrout, and common snook are also three of the most sought recreational fish in the Lagoon, while the bay anchovy and striped mullet are important commercial species. Other saltwater and freshwater sport fishing in the County include sailfish, dolphin, white and blue marlin, tarpon, speckled trout, cobia, grouper, snapper, croaker, shark, sheepshead, largemouth bass, black crappie, bluegill, redear sunfish, and speckled perch. The major sources of consumable shellfish within the Indian River Lagoon are blue crab, the southern hard clam and the northern hard clam, and the American oyster. St. Lucie County has one area of conditionally approved shellfish harvesting north of Ft. Pierce Inlet (Figure 8-8).

The landings in Table 8-2 were obtained from the Division of Marine Resources landings report for St. Lucie County. Wholesale and retail seafood dealers, following the mandatory reporting requirements report, purchases of saltwater products from fisherman by dealers. Please note that these are the landings reported in St. Lucie County, this does not ensure that all seafood caught within St. Lucie County is reported within St. Lucie County.

Historically, scrub formed a virtually continuous zone along the Atlantic Coastal Ridge and in St. Lucie County, along the North Fork of the St. Lucie River and its tributaries (Fernald, 1989). Because scrub occupy the highest coastal ridges, railroad and highway construction historically occurred first in these communities, predisposing them to subsequent development. Currently, there is very little protected scrub or scrubby flatwoods habitat in the County except for the Savannas State Reserve and Bluefield Ranch. The South Savannas Reserve contains 732 acres of scrub along the Atlantic Coastal Ridge. This area constitutes the largest continuous tract of scrub in the County. Another 607 acres of scrub have been purchased through the County's Environmentally Significant Lands program. The largest tract purchased through the ESL program consists of two areas of sand pine on Bluefield Ranch totaling 507 acres. The remaining 100 acres of preserved scrub occurs along the North Fork of the St. Lucie River and the Atlantic Coastal Ridge.

Figure 8-6. St. Lucie County - Generalized Soils Map

Figure 8-7. St. Lucie County - Generalized Mining Locations

TABLE 8-2 Commercial Saltwater Fish Landings for St. Lucie County, 1994-1998										
	Year									
	1994		1995		1996		1997		1998	
	Pounds	Ex-vessel value								
Sub-group:										
Fin Fish	4,363,358	4,453,222	3,428,234	4,696,697	2,750,029	3,637,834	2,972,858	3,742,847	3,011,583	3,997,076
Invertebrates	56,022	33,391	53,488	34,343	62,628	28,044	109,482	55,906	67,673	42,095
Food Shrimp	1,071,100	1,558,153	1,367,030	1,600,832	5,502,830	3,927,345	208,706	353,321		
Bait Shrimp									52	124
Total	5,490,480	6,044,766	4,858,752	6,331,873	8,315,487	7,593,223	3,291,046	4,152,075	3,079,308	4,039,294

F. UPLAND VEGETATIVE COMMUNITIES

KBN Engineering and Applied Sciences' January 1992 report "Wetland and Upland Habitat Inventory: St. Lucie County" identifies the natural plant communities remaining based on several informative sources. The report sources included the Guide to the Natural Communities of Florida (FNAI, 1990), Soil Conservation Services Soil Survey of St. Lucie County, South Florida Water Management District, and the Florida Game and Fresh Water Fish Commission Landsat Land-Cover, 1989. The KBN study documentation of remaining native plant communities is utilized to fulfill the 1990 Conservation Element directive requiring the preservation of 25% of the County's remaining native uplands. This directive is primarily implemented through the County's Environmentally Significant Lands program which has acquired almost 3,000 acres of native upland habitat for preservation purposes.

Three major classifications of upland vegetative communities were identified, each incorporating ecological variations of the original category. They are: Xeric Uplands, Coastal Uplands, and Mesic Flatlands.

1. Xeric Uplands

The xeric uplands are sand pine and oak scrub communities and are located on well-drained, sterile sands. Sand pine and scrub sites are classified as scrub and overgrown thickets where oaks have grown into trees are considered xeric hammock. These habitats typically occur on white sand ridges either along the Atlantic Coastal Ridge or on "islands" of high ground in the southwest part of the County. Because of their rarity, scrub communities are ranked imperiled statewide and globally by the Florida Natural Areas Inventory (FNAI, 2000).

Figure 8-7. St. Lucie County - Approved Shellfish Harvesting Areas

2. Coastal Uplands

Located primarily on the barrier island, this category consists of grassy beach dune, which grades into shrubby coastal strand and then into maritime hammock. This category occupies areas formed along high energy shorelines, and is influenced by wind, waves, and salt spray. Associated with the coastal upland habitats are old sand bars, as well as old Indian mounds, both shell and burial mounds. In St. Lucie County, these habitats have a mixture of tropical and temperate vegetation. However, due to development in the coastal areas of the County, the boundaries of this habitat category have been significantly reduced. Maritime hammock, coastal strand and beach dune communities are imperiled statewide because of their rarity or their vulnerability to extinction (FNAI, Tracking List of Rare, Threatened and Endangered Plants, Animals and Natural Communities of Florida , 2000)

3. Mesic Flatwoods

The mesic flatwoods category includes upland habitats that are inland from the coastal ridge. This category includes the open dry prairies of native grasses and wildflowers, the mesic flatwoods of slash pine and palmetto, the more xeric scrubby flatwoods with an understory of scrub species beneath the slash pines, and the prairies hammocks of cabbage palm and live oak. At the current rate of habitat conversion, mesic flatwoods, once one of the most abundant upland habitat in South Florida, is in danger of becoming one the rarest habitats (USFWS, South Florida Multi-Species Recovery Plan, 1999).

G. WILDLIFE

This section provides an overview of the wildlife within St. Lucie County. Although an extensive inventory is not available, ecological communities support particular kinds of wildlife. The Florida Natural Areas Inventory is a private, non-profit organization dedicated to gathering, interpreting and disseminating information critical to the conservation of Florida's biological diversity. The organization tracks rare plant and animal species, and high quality natural communities throughout the state. They also provide a summary of Rare Species and Natural Communities occurring or likely to occur by county (Appendix 8-A-2).

1. Wildlife within Upland Ecological Communities

A host of animal species supported by xeric upland habitats utilize the scrub in St. Lucie County. Vertebrates generally found in scrub habitats are the Florida mouse, Florida scrub-jay, Florida scrub lizard, gopher tortoise, white-tailed deer, bobcat, gray fox, eastern indigo snake, Florida pine snake, bobwhite, cotton mouse, gopher frog, downy and hairy woodpecker, great crested flycatcher, and rufous-sided towhee. Scrub is often considered Florida's most distinctive ecosystem. An estimated 40 to 60 percent of its species are endemic (Myers, Ecosystems of Florida, 1990).

Wildlife species associated with the coastal upland communities include the following: raccoon, loggerhead turtle, green turtle, gopher tortoise, pileated woodpecker, least tern, yellow and black-crowned night herons, eastern indigo snake, coachwhip snake, black skimmer, beach mouse, cotton mouse, eastern cotton tail rabbit, armadillo, opossum, and gray fox.

In 1994, the Florida Game and Freshwater Fish Commission, Strategic Habitat Conservation Areas were identified for four rare natural communities, one of which occurs in St. Lucie County, scrub. Scrub is known to support many rare and imperiled plants and animals, and protection of the community will accomplish the protection of many species at one time (Cox, Habitat Conservation Needs of Rare and Imperiled Wildlife in Florida ,2000). In St. Lucie County, 10-15 acre conservation areas for rare plants, 15-20 acres for territories of the Florida Scrub-jay, and 50 acre conservation areas for larger scrub communities were recommended for conservation by Fernald (Cox, Closing the Gaps in Florida's Wildlife Habitat Conservation System, 1994).

Among the flatwoods associations, the following are some of the species generally found in St. Lucie County: Florida sandhill crane, red-cockaded woodpecker, pileated

woodpecker, raccoon, red-shouldered hawk, red-tailed hawk, eastern meadowlark, fox squirrel, great horned owl, gray fox, burrowing owl, bald eagle, Audubon's crested caracara, white-tailed deer, bobcat, cotton rat, least shrew, Florida mouse, Florida scrub-jay, southeastern kestrel, and swallow-tailed kite. Avian densities are typically low throughout the year, with some increase in winter due to the influx of migratory winter residents (Abrahamson and Hartnett, 1990). In South Florida mesic flatwoods are known to support, 28 mammal, 116 birds, 29 reptile and 13 amphibian species. Fifteen (15) of these species are federally listed species (USFWS, South Florida Multi-Species Recovery Plan, 1999).

2. Wildlife within Wetland Ecological Communities

Wetland ecosystems in Florida are one of the most productive and rich with species diversity. The 1992 KBN Wetland and Upland Habitat Inventory: St. Lucie County, identified the following wetland plant communities: wet prairie, wet flatwoods, hydric hammock, floodplain forest, floodplain swamp, floodplain marsh, swale, slough, stand swamp, bog (bayhead) depression marsh, dome swamp, saltmarsh and mangrove swamp. Within these communities, a host of species have been reported to occur, including: swallow-tailed kite, snail kite, wood stork, brown pelican, least tern, tri-colored heron, crested caracara, white-tailed deer, Florida panther, bobcat, great blue heron, white ibis, little blue heron, roseate spoonbill, great egret, bald eagle, red-shouldered hawk, red-tailed hawk, pileated woodpecker, barred owl, great horned owl, and sandhill crane.

3. Birds

For the last 34 years, the Ft. Pierce Christmas Bird Count has recorded wintering birds and other species which may breed or pass through the County. A total of 241 avian species have been recorded in the County between 1957-1998 (1991-1994 the Christmas Bird Count was not conducted). Between 1990 and 1998, 174 avian species have been observed during the Christmas Bird Count, including the following species which are listed as endangered, threatened, or species of special concern:

- * Little blue heron;
- * Tri-colored heron;
- * Brown pelican;
- * Wood stork;
- * Red-cockaded woodpecker;
- * Crested caracara;
- * Florida scrub-jay;
- * Roseate spoonbill;

- * Limpkin;
- * Snail kite;
- * Southern bald eagle;
- * Southeastern American kestrel; and
- * Florida sandhill crane.

The total number of sightings by specie recorded for the years 1990 through 1998 is included in (Appendix 8-A-3). Other species known or suspected to occur in the County, but not sighted on the day of the Audubon Christmas Bird Count are the burrowing owl, Wilson's plover, red-headed woodpecker, ruby-throated hummingbird, and the Bachman's warbler.

One of the reasons for such avifaunal richness is the Indian River Lagoon, which provides a wide array of habitats for wading birds and wetland-dependent avian species. These habitats include open water, mangroves, salt marshes, spoil islands, and mosquito impoundments, which attract and sustain numerous avian species. As a result, the Lagoon provides habitats for resident and wintering species, as well as migratory species utilizing the Eastern Flyway. In fact, in the Lagoon, numerous rookeries have been documented due to the presence of suitable nesting substrates, isolation, protection from predators, and proximity of feeding areas (Woodward-Clyde, Indian River Lagoon National Estuary Program, 1994).

4. Species Listed as Endangered, Threatened, or of Special Concern

Endangered and threatened species are those plants and animals in danger of extinction or likely to become endangered, as designated by both the federal government (Endangered Species Act of 1973) and the State of Florida (Chapter 372.072, Florida Statutes, and Chapter 39-27, Florida Administrative Code). The State also lists species whose survival potential is of special concern.

The following describes some of the listed species known or suspected to occur in St. Lucie County by reason of distribution and habitat (Florida Game and Fresh Water Fish Commission, Closing the Gaps in Florida's Wildlife Habitat Conservation System, 1994). The Florida Natural Areas Inventory Summary of St. Lucie County Rare Species which indicates the protected status of State and Federal listed species is also included in Appendix 8

- * Native species of bromeliads, cactus, ferns, orchids, and palms, all of which are

considered threatened by the Florida Department of Agriculture and Consumer Services, except those specifically exempted or listed under other categories;

- * Migratory bird species that occur but do not breed in the County and are listed because of loss of breeding habitat; and
- * Species of whales and dolphins that may occur in the offshore waters of the County.

Listed species are frequently dependent upon a particular habitat and reductions in the habitat are frequent causes of listing. It is impossible to manage a listed species without protection of the required habitat. Particularly important habitats for listed species in St. Lucie County are the dunes and beaches, mangroves and coastal marshes, freshwater marshes, and sand pine scrub.

Critical habitats have been designated within St. Lucie County for the Florida snail kite (50 CFR, 17.94, U.S. Fish and Wildlife Service, 1995). and the West Indian manatee. These are areas of particular importance for the continued existence of the species and are not meant to imply that the species occur nowhere else in the County. In fact, the Florida snail kite is regularly seen in the Savannas, which has not been designated critical habitat, but is a wildlife preserve.

There are various causes for a species being listed. Some species have never been common. Some species are vulnerable because they are restricted to a limiting resource or habitat. Lakela's mint and the red-cockaded woodpecker are representatives of this category in St. Lucie County. The most serious threat to the continued existence of many listed species is the alteration of their habitat by man. Even clearing and alteration of natural areas will encourage exotic plant species to invade native habitats, often resulting in shading out native plant species. It is impossible to discuss all of the factors which affect each listed species in St. Lucie County, but several of the more conspicuous factors will be discussed.

Many of the listed plant species are threatened because of collection pressure. The ferns, coontie, orchids, cactus, and bromeliads are especially vulnerable to collection. The fragrant prickly-apple is restricted to a very small range on private land and could be eliminated were the location widely known.

Another major threat to many of the plant species is loss of habitat to development. Species such as Catesby's lily, Lakela's mint, and Curtiss' milkweed occur in flatwoods or sand pine scrub that are prime areas for development. Several beach and dune species, such as sea-lavender, beach creeper, and inkberry, are also subject to loss of habitat to development.

The beaches of east central Florida, including St. Lucie County, are an important breeding ground for several species of sea turtle. The leatherback, green, and loggerhead sea turtles have all been recorded breeding on the beaches of St. Lucie County in recent years. The nests of these turtles are highly vulnerable to natural predators and to disturbance on the beaches. Projects have been established in many sea turtle nesting areas to monitor and protect the nests of sea turtles and encouraging results have been obtained. Another threat to the hatchlings is the increasing light pollution that accompanies development along beaches and causes disorientation as they attempt to find the ocean after birth. The County's sea turtle protection regulations restricts the hours and months that artificial light can shine on the beach area, however, it is becoming apparent that interior lights (mostly from existing development) are a major cause of hatchling disorientation.

The gopher tortoise, although locally common in St. Lucie County, is a species of special concern statewide (Florida Game and Fresh Water Fish Commission, Florida's Endangered Species, Threatened Species and Species of Special Concern, 1997). The gopher tortoise is important because its burrows are frequently inhabited by other animals, some of which occur nowhere else and some of which are themselves listed species. Among the listed species that occur with gopher tortoises, though not necessarily exclusively, are the Florida gopher frog, Eastern Indigo snake, and Florida mouse.

Many colonial waterbirds are common in St. Lucie County and use a variety of wetlands for feeding and roosting. Breeding colonies of great egret, great blue heron, little blue heron, tri-colored heron, and wood stork were documented in St. Lucie County (Florida Game and Freshwater Fish Commission, Closing the Gaps in Florida's Wildlife Habitat Conservation System, 1994). Brown pelicans and snowy egrets also nest within the County.

Bald eagles are seen regularly in St. Lucie County and at least one bald eagle nest is documented in the County. Pairs of bald eagles are highly variable in their tolerance of

human activity around the nest.

The red-cockaded woodpecker nests only in mature pines and almost exclusively in those with red-heart disease. Nests in northern Florida are generally in longleaf pine (*Pinus palustris*), but slash pine (*Pinus elliotti*) is also used in south Florida. The woodpeckers frequently have non-breeding helpers within a family unit referred to as a "clan". A clan requires large areas for its home range. An average of 200 acres per clan has been reported. Logging practices that remove all the old trees have severely endangered this woodpecker. Red-cockaded woodpecker clans have been located in St. Lucie County, generally in areas that are slated for development. At the time of this writing at least one active colony is known in St. Lucie County and it is in an area of active development.

The Florida scrub jay, is restricted to scattered and isolated patches of scrub oak habitat much of which has been cleared for urban development (Florida Game and Freshwater Fish Commission, 1991). It is known to inhabit several areas within the County (U.S. Fish and Wildlife Service, County biologist, 1997). A sizable population exists within the Savannas State Reserve with several other families located throughout the County. However, the South Savannas Florida scrub-jay populations may not be viable long-term unless additional scrub habitat is protected and managed for their use (Kautz, 2000).

The American oystercatcher nests on broad sandy beaches, but suitable habitat is rare and restoration and protection of suitable nesting areas are necessary to halt their decline (FGFWFC, 1982).

Manatees are still common in the Indian River Lagoon. Many of the manatees congregate at the Moores Creek Fort Pierce Utility Power Plant Florida Power and Light- St. Lucie Nuclear Power Plant, and, to a lesser extent, in the canals and coves north and south of the inlet. Manatees also frequent the North Fork of the St. Lucie River. The Florida Department of Environmental Protection maintains surveys of the manatee's population, distribution, and fatalities.

Due to boat collision with the slow moving manatee, the State has established idle/no wake and slow speed zones within the Indian River Lagoon and the North Fork of the St. Lucie River. Available data indicates that collisions with watercraft may be the single largest human-related cause of mortality within the Lagoon, and that it is positively correlated with the amount and density of boat traffic (Woodward-Clyde, Indian River Lagoon National Estuary

Program, 1994). St. Lucie County has commissioned the preparation of a Manatee Protection Plan to further protect these endangered species.

Several listed species have adapted to urban areas. The least tern, a summer resident, historically nested on beaches but have begun to utilize gravel rooftops, parking lots and other such landscapes in the County where beaches have been disturbed (FGFWFC, 1982). On the mainland, Florida sandhill cranes and woodstorks are often sighted along roadside and in residential neighborhoods.

POTENTIAL FOR CONSERVATION, USE OR PROTECTION OF NATURAL RESOURCES

As a general rule, maximizing habitat diversity in protected areas and providing connections between habitats enhances biodiversity and the longterm viability of wildlife, marinelife and vegetative species. If these resources are not protected the loss of the natural qualities of our resources can negatively effect the county's economic viability as well as the viability of the county's wildlife, marinelife and vegetative communities. The protection and management of native habitats offer opportunities to provide passive recreational uses, environmental education programs and open space areas that contribute to a better quality of life within St. Lucie County.

A. WATER RESOURCES

Conservation, use, or protection of surface waters on a local scale can best be handled through cooperation and support of State and Federal initiatives to improve the estuarine environment (such as the National Estuary and Comprehensive Everglades Restoration programs), as well as through local initiated conservation and water quality improvement projects. Other local measures include, public education on the value of habitat protection, effective enforcement of existing habitat protection regulations (such as shoreline stabilization or buffer requirements), and establishment of new mechanisms for surface water conservation.

Several local projects have been implemented to protect the County's water resources, including the public purchase of lands that protect surface and groundwater resources, impoundment restoration, stormwater improvements, and restoration of degraded natural areas.

These public projects, in conjunction with the County's resource protection standards and water conservation programs, will assist the County in protecting its water resources.

1. Surface Waters

With the exception of small areas in the extreme northeast and southwest, St. Lucie County is within the St. Lucie watershed which is designated a high priority area for protection under the State of Florida's Surface Water Improvement and Management (SWIM) Act. The SWIM Act requires management and restoration plans for preserving or restoring priority waterbodies and setting Pollutant Load Reduction Goals for these waterbodies. The 1999 Florida legislature also enacted the Florida Watershed Restoration Act to provide a process for restoring waters through the establishment and implementation of Total Maximum Daily Loads (TMDL) for impaired waters. TMDLs are the maximum level of pollutant loading a waterbody can receive while meeting the overall pollutant load reduction goals needed to restore and maintain state water quality standards. TMDLs are required for all waters not meeting water quality standards or not supporting their designated uses (DEP, Total Maximum Daily Load Program, 2000). TMDLs and Pollutant Load Reduction Goals are required for all the County's major canal systems, Ten Mile Creek, and the North Fork of the St. Lucie River. The development of TMDLs for all of the County's listed water bodies, except Ten Mile Creek, are considered a high priority and are projected to be established by the year 2005. Ten Mile Creek is listed as a low priority with TMDL development projected to be developed in 2010.

The large volume of freshwater and the poor quality of water entering the Indian River Lagoon from the St. Lucie River Watershed led to the establishment of the Water Preservation Area Task Force, which includes Martin County and St. Lucie County representatives. This task force, sponsored by the Army Corps of Engineers, recommended sites for the establishment of a water preserve area within the St. Lucie Estuary Watershed. The work of the task force was ultimately carried forward by the authorization of the Restudy and the release of the Indian River Lagoon Feasibility Study. The Indian River Lagoon study is a portion of the Central and South Florida Ecosystem Restoration and Restudy efforts. In early 1999, the Indian River Lagoon Feasibility Study team was brought together to work on the implementation of this portion of the Restudy. The Indian River Lagoon Project Implementation team is developing specific recommendations for the project implementation phase of the study to improve water

quality and wildlife habitats within St. Lucie and Martin Counties. The final draft of the Indian River Lagoon Implementation Plan was released in the summer of 2001.

In 1996, the Army Corps of Engineers and South Florida Water Management District nominated the Ten Mile Creek Water Preserve for funding under Section 528 of the Water Resources Development Act, Critical Restoration Project program to begin restoration projects in the St. Lucie River basin. The Ten Mile Creek Water Preserve Project is a natural resource conservation and infrastructure project that has the potential to serve as the catalyst for the restoration and enhancement of the St. Lucie River. The proposed project includes the acquisition of approximately 700 acres in the Ten Mile Creek Basin and construction of a water attenuation facility. The majority of the lands targeted for this purchase have been purchased and improvements are currently under design. The facility is expected to be constructed within the next two to three years.

In early 1998, there was a fish lesion epidemic in the St. Lucie River and Indian River Lagoon. As a result, a multi-agency team, the St. Lucie Issues Team, was brought together to identify short term projects which would address local stormwater issues that were negatively impacting water quality in the basin. Since 1999, the Florida legislature has allocated \$17.5 million to implement St. Lucie Issue Team projects that will improve the quality of the St. Lucie River and Indian River Lagoon. Restoration projects include stormwater retrofit, reconnection of ox-bows along the North Fork of the St. Lucie River, restoration of degraded natural areas, and research projects that are expected to result in improved water quality in the St. Lucie River Estuary.

The State has also implemented a Best Management Practice program to improve the quality of surface waters. Under the Best Management Practice (BMP) program, citrus growers are urged to perform an environmental assessment of their crop management operations. Members of the Indian River Citrus League took action to reduce harmful discharges by spear heading an initiative to utilize best management practices in their citrus operations. A multi-party steering committee of State, Federal and citrus growers guided the development of Best Management Practices for the Indian River area citrus growers. Local growers are encouraged to utilize the ■Water Quality/Quantity BMPs for the Indian River Area Citrus Groves• manual to implement practices to improve the quality and quantity of water draining into the Indian River Lagoon and St. Lucie Estuary. Implementation of agricultural Best Management Practices should have a significant impact on pollutant loadings to the North Fork of the St. Lucie

River and downstream estuaries, the St. Lucie Estuary and the Indian River Lagoon.

To address a decline of water quality in the South Savannas, the National Oceanic and Atmospheric Administration and the Florida Department of Environmental Protection Ambient monitoring program (1997) carried out a study entitled ,•Stormwater Impact on the Savannas State Reserve• to investigate the effects of stormwater on the Savannas ecology. This study found that biological communities in the area of the Savannas, adjacent to Indian River Estates, are degraded due to the introduction of untreated stormwater (Graves, Stormwater Impact on the Savannas State Reserve, 1997). St. Lucie County, in cooperation with the South Florida Water Management District and the Florida Department of Environmental Protection, have proposed to retrofit this subdivision with improved stormwater controls.

St. Lucie County should continue its participation in programs striving to improve the quality and quantity of the County's water resources. Some of these programs and projects include: the Indian River Lagoon National Estuary program, Surface Water Management Improvement program, the South Florida Ecosystem Restoration and the Central and South Florida Restudy. The County should also continue to coordinate with state and regional agencies to implement programs and capital projects to improve the quality of urban and agriculture stormwater runoff entering the County's surface waters.

2. Groundwater

As previously seen in this Element, the County's water needs are met by the Surficial Aquifer System and the Floridan Aquifer System. Known pollution problems with the shallow aquifer come from groundwater contamination by hazardous substances, salt water intrusion, and poor quality recharge. The South Florida Water Management District, St. Lucie County, Ft. Pierce, Port St. Lucie, and St. Lucie Village have initiated public wellfield programs which should effectively reduce the potential threat of groundwater contamination, as will the continuation of the abandoned artesian well plugging program by the County and the South Florida Water Management District.

The Water Resources Act of 1972 mandated each water management district to "promote the conservation, replenishment, recapture, enhancement, development, and proper utilization of

surface and groundwater" (Section 373.013 F.S.). St. Lucie County continues to support the South Florida Water Management District's water conservation program which helps to prevent loss of water resources and potential contamination of the Surficial Aquifer. Another water conservation measure the District and the County are proposing is a series of reservoirs and water preserve areas in the western portion of the County, that will allow the storage of water that is currently lost to tide.

Water conservation refers to water use practices and technologies that provide the services desired by the users while using less water. Water conservation measures achieve long-term permanent reductions in water use. St. Lucie County continues its support and participation in state and federal programs to improve surface water quality, and consider adoption of a water conservation ordinance which helps to prevent loss of water resources and potential contamination of the Surficial Aquifer.

The South Florida Water Management District requires individual permit applicants for public water supply permits to submit a water conservation plan as a condition of issuance. The conservation plan must include the following: adoption of an irrigation ordinance; adoption of a Xeriscape landscape ordinance; adoption of a rain sensor device ordinance; adoption of a water conservation-based rate structure; implementation of a leak detection and repair program; implementation of a water conservation public education program; and an analysis of reclaimed water feasibility.

St. Lucie County has adopted several water conservation ordinances including: water conservation based rate structure, a rain sensor device ordinance, and a Xeriscape ordinance. The County should consider adopting additional water conservation measures and promote the implementation of the district's water conservation measures in all public water supply facilities.

B. COMMERCIALY VALUABLE MINERALS

The value of the sand, shell, and other fill materials on a local basis varies depending on need and location. Sand mines are required to have a plan of reclamation prior to excavating reclaimed mines may be used for urban development, recreation, or stormwater treatment, however; additional measures are needed to reduce the impacts of mining activities

on wildlife habitats and adjacent properties.

C. SOIL EROSION

The Soil Conservation Service (1980) classifies individual soils with regard to water and wind erosion. Most of the soils in St. Lucie County have severe limitations for urban development activities. The limitations include slope, wetness, cutback caves, seepage, slow percolation, cemented pan, ponding, excess humus, floods, subsidence and low strength. Even with proper site modification, some limitations cannot be overcome and site development usually includes fill.

Areas of known erosion in St. Lucie County include the beach shoreline, dikes along drainage canals in agricultural areas, the North Fork of the St. Lucie River and the Indian River Lagoon and their natural tributaries where native vegetation that stabilizes the shoreline has been removed.

Dredge spoil has been confirmed to occupy roughly 8.9 miles or 16.2% of the 55 mile main branch of the North Fork of the St. Lucie River (Beal, 2000). The existing spoil berms along the riverfront are 2-18 feet high and 10-30 feet wide (Beal, 2000). High spoil berms eroding along Ten Mile Creek from the Gordy Road to its confluence with Five Mile Creek have resulted in trees and sediment accumulations in the waterway. This section is also heavily infested with Brazilian pepper to the point of obstructing the waterway upstream of Selvitz Road (Beal, 2000). Brazilian pepper trees may be undermining the soil stabilizing features that native plant species provide along the riverbanks. Restoration needs should be identified and projects implemented to restore and stabilize the shoreline of the North Fork of the St. Lucie River and its major tributaries.

Significant erosion in agricultural areas generally occurs when crop land is allowed to lie fallow for extended periods of time and is particularly noticeable in fallow vegetable fields, pastures, and citrus groves. Beach erosion is addressed in detail in the Coastal Management Element; generally, the most serious problems have been attributed to storms and the interruption of littoral drift by the jetties at the Ft. Pierce Inlet primarily affecting South Hutchinson Island.

The Soil Conservation Service has developed Best Management Practices for the different soil

series to prevent or reduce erosion and oxidation of organic soils. Procedural practices include developing land in phases so that it is not denuded at the same time; alternating development to leave windbreaks; leaving vegetated buffer zones adjacent to waterways; plowing, and discing at right angles to the prevailing winds; and rotating stock to prevent overgrazing. Structural approaches include retention/detention of stormwater, grassed swales and flow ways, dust/cohesion control chemicals, and early replacement of vegetative cover.

D. HAZARDOUS SUBSTANCES

Hazardous wastes are materials which, because of their quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated, or otherwise managed" [FS 403.703(21)].

Hazardous substances pose a potential threat to the surficial water supply in St. Lucie County. Improper disposal or accidental spills of even small amounts of hazardous substances can contaminate large quantities of groundwater in very short time since the water table is generally high and upper layer soil horizons are permeable. Potential threats exists within residential, commercial, and industrial areas as well as at existing and closed landfills. Known pollution problems are Ft. Pierce Utility Authority water supply wells and direct contamination of some of these wells from gasoline and organic solvents, respectively.

There are various means to reduce the threat of contamination. State initiatives include, but are not limited to legislation directed at hazardous waste management (Chapter 403, Part IV, Florida Statutes) and well field protection (Chapter 163, Part II, Florida Statutes).

In 1986, St. Lucie County prepared a countywide Hazardous Waste Management Assessment. The assessment included a detailed inventory of hazardous waste generators and analyzes management practices. The County continues to evaluate hazardous waste management inventories and practices through the evaluation of 20% of potential generators each year. In 1999, the County contained approximately 600 hazardous waste generators.

Another related County program which addresses potential generators has been implemented cooperatively between the Public Heath Unit (PHU) and the County. This program requires an applicant for an occupational license to be interviewed by the PHU. If the proposed business

involves hazardous substances, the PHU performs an on site inspection to determine if proper management of the substances has been addressed, prior to issuance of the license by the County.

To ensure the proper disposal of household hazardous waste, the County's Solid Waste Management Division operates a facility that allows the free disposal of up to 100 pounds of household waste. This facility is open every Friday and the second Saturday of each month. Public education programs are also conducted each year through local newspapers.

The County's Well-field Protection Ordinance identifies cones of influences around public well fields and restricts potentially hazardous land uses within this area. These regulations are implemented through the County's site planning and building permit process.

E. VEGETATION, WILDLIFE, FISHERIES, AND ENDANGERED SPECIES

The various native habitats throughout the County are subject to intense urban and agricultural development and invasion by exotic plant species. The Florida Natural Areas Inventory tracks listed plant and animal species and their habitats throughout Florida, in an effort to protect declining habitats and listed species. St. Lucie County's evaluation is shown in Appendix 8-A-2. One of the more sensitive and unique habitats is the sand pine scrub community which lies along the Atlantic Coastal Ridge. Since it is on high, dry ground, it is especially attractive for development. Most development takes place in all types of upland habitats where regulatory requirements are less than wetlands. The results of uncontrolled development in upland natural areas include: the loss of wildlife habitat and associated flora and fauna, including species listed as endangered, threatened, or of special concern; the loss of soil and water retention, shading and buffering capabilities; and the loss of functional ecosystems. Physical damage caused by off-road vehicles and the dumping of trash, garbage and other waste within these communities also occurs. Of particular concern is the damage from off-road vehicles within dune and xeric communities.

There are many ways to conserve unique vegetative communities and associated wildlife yet maintain appropriate levels of use for urban and agricultural development. These include better coordination with State and Federal agencies during development review processes, the establishment of criteria to identify environmentally sensitive habitats and incentives for

property owners to conserve and manage them, the identification of and application to public programs for acquisition and management of the more valuable habitats, and the prohibition or regulation of activities (such as the use of off-road vehicles) in sensitive ecosystems.

The conservation of fisheries on a local scale can best be handled through cooperation and support of State initiatives to improve the freshwater and estuarine environments (such as Surface Water Improvement and Management projects on water quality and seagrasses), as well as through local initiatives such as public education on the value of habitat protection, effective enforcement of existing habitat protection regulations, and implementation of habitat management techniques (such as shoreline stabilization or buffer requirements). The County should continue to identified programs and implement projects to improve the quality of its surface waters.

F. NATURAL AREA PRESERVES

Natural area preserves are those lands maintained and managed in essentially their natural state with the primary objective of conserving and protecting their environmentally unique, irreplaceable and valued ecological resources, including the plant and animals species they support. Natural area preserves protect biodiversity and can provide recreation and aesthetic benefits to the public. Public use and enjoyment of these lands are only limited to the extent required to maintain the natural resource values of the natural area preserve.

In November 1994, County voters approved a \$20,000,000 bond referendum to finance the costs of acquiring environmentally significant lands and wildlife habitat. Through the St. Lucie County Environmentally Significant Lands (ESL) program, lands are identified, assessed, prioritized and purchased or protected by some other means. The Land Acquisition Selection Committee, which was formed to review and recommend sites for purchase, has targeted almost 20,000 acres for purchase. Matching funds, primarily through the Preservation 2000 program, have been secured, and approximately 6,000 acres of natural areas have been purchased to date (Figure 8-9). Through public acquisition and proper land management the County's Environmentally Significant Lands program will ensure the long term viability of natural areas throughout St. Lucie County.

The qualifying criteria used to identify environmental uplands for purchase include:

- * The presence of unique ecological communities;

- * Quality of the native uplands;
- * Presence of rare and endangered plant and animals species;
- * Land that safeguards water quality;
- * Vulnerability to development;
- * Proximity to other preserves and greenways;
- * Land that provides passive resource-based recreational opportunities.

The ESL bond referendum and the Preservation 2000 program have had a major impact on the County's future. Some benefits derived from the purchase of ESLs include: protection of the biodiversity of plant and animal communities, protection of natural buffers that filter stormwater runoff along our waterways, areas for residents and visitors to exercise and experience native Florida vegetative communities and wildlife, lands for outdoor classrooms for all ages, and protection of scenic roadways for travelers. The connection of public and private conservation lands to parks and cultural sites into a greenway network can also create a more livable community by stimulating eco-tourism and environmentally friendly business, providing alternative modes of transportation, and safeguarding ecological systems and wildlife corridors. The County should continue efforts to connect its cultural and natural resources and provide spaces and amenities that enhance the public use of these areas while promoting and protecting the County's remaining natural areas.

The approximately \$4,000,000 remaining in the Environmentally Significant Lands Bond Fund will cover the County's share of costs to acquire part, but not all, of the estimated 11,000 acres identified as suitable for preservation. The Land Acquisition Selection Committee and the Board of County Commissioners have selected over 11,000 additional acres for purchase. Many of these lands have received approval for matching funds from various Preservation 2000 programs. While it is not expected that all of these lands can be purchased, the acquisition of all selected lands would require an estimated \$6,000,000 in local matching funds. Therefore, following the expenditure of funds generated from the current bond program, natural areas will remain in need of public purchase. A strategy to protect the unacquired lands should be developed. This can be addressed through the re-establishment of the Land Acquisition Finance Committee to review the current and future financial needs of the Environmentally Significant Lands program.

In 1999, the Florida legislature created the Florida Forever program, the successor to

Preservation 2000, which will continue the State's effort to protect natural areas over the next 10 years. Unlike its predecessor, Florida Forever emphasizes land management, water resource development, and acquisition of parks in urban areas in addition to the protection of native plant and animal species. To participate in the Florida Forever Program, an additional source of local matching funding must be identified. Some of the ways this could be accomplished include: impact fees for environmental lands, set aside requirements for uplands that provide an alternative to contribute to a upland mitigation fund, and a second Environmentally Significant Lands bond referendum.

GOALS, OBJECTIVES AND POLICIES

The following Comprehensive Plan Goals, Objectives, and Policies are modifications of the portions of the Element as adopted in 1990.

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GOAL 8.1 THE NATURAL RESOURCES OF ST. LUCIE COUNTY SHALL BE PROTECTED, APPROPRIATELY USED, OR CONSERVED IN A MANNER WHICH MAXIMIZES THEIR FUNCTIONS, AND VALUES.

Objective 8.1.1 Air quality within St. Lucie County shall meet or surpass National Ambient Air Quality Standards (NAAQS) for all pollutants measured by the Florida Department of Environmental Protection.

Policy 8.1.1.1 Annually review existing air quality reports and confer with the FDEP on the source(s) of air quality violations and the proper abatement methods. If needed, regulations will be developed to enforce clean air standards.

Policy 8.1.1.2 St. Lucie County shall facilitate development that maximizes energy efficiency and sustainability. This shall include implementing Land Development Code standards that promote the types of land use patterns and development techniques that will reduce the total fossil fuel energy required to build and maintain urban land uses. This shall include standards that promote mixed land use patterns, urban infill, public transit and provide non-motorized interconnections between land use types to reduce auto dependence and vehicle miles traveled.

Policy 8.1.1.3 The County land development regulations shall address requirements to reduce the amount of total suspended particulates from construction activities. At a minimum, construction practices including but not limited to seeding, wetting, and mulching which minimize airborne dust and particulate emission generated by construction activities shall be undertaken within five (5) working days of completion of clearing work.

Policy 8.1.1.4 The County land development regulations shall address excessive dust and suspended particulates with regard to site clearing and stabilization, vegetation removal, and other factors associated with construction.

Policy 8.1.1.5 The County shall enact additional land development regulations which prevent air pollution if FDEP air quality report indicate that NAAQS are not being met.

Objective 8.1.2 The County shall continue to enforce land development regulations which require the conservation, appropriate use, and protection of surface waters.

Policy 8.1.2.1 The County land development regulations shall address comprehensive stormwater management including the following:

- a. The use of stormwater detention and/or retention;
- b. Streambank and shoreline buffer zones;
- c. General design and construction standards for on-site stormwater management;

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- d. Best management practices for urban and agricultural development; and
- e. standards for new discharges to Outstanding Florida Waters.

- Policy 8.1.2.2 St. Lucie County shall continue to implement stormwater improvement projects consistent with the Stormwater Management Plan and apply for state and federal funding programs to supplement local programs in the implementation and construction of stormwater management projects.
- Policy 8.1.2.3 St. Lucie County shall evaluate the use of the following mosquito control techniques during the development of the new stormwater regulations:
- a. Maintenance of any required littoral areas and upland buffers;
 - b. A one (1) foot, or other appropriate buffer between the bottom of stormwater ponds and the water table; and
 - c. Fish ponds for use during low water periods.
- Policy 8.1.2.4 St. Lucie County shall request from the South Florida Water Management District with appropriate administrative and/or fiscal support, a project which evaluates the economic and environmental feasibility of a reservoir in the County. At a minimum, the project should consider reductions of freshwater inputs and stormwater pollutants to the surface waters within the County, as well as conservation of water resources.
- Policy 8.1.2.5 The land development regulations stormwater management provisions shall require a vegetated and functional littoral zone to be established as part of the surface water management system of upland water bodies occurring on development sites.
- Policy 8.1.2.6 St. Lucie County shall encourage the preservation of natural scenic views of natural waterways through the site plan review process.
- Policy 8.1.2.7 The County shall not support the reclassification of any surface water body within County boundaries to acknowledge lower water quality conditions, unless necessary to protect the public health, safety, or welfare. The County shall support any effort to reclassify surface water bodies to accommodate higher standards.
- Policy 8.1.2.8 The County shall take an active role in the funding and development of appropriate attenuation facilities and ecosystem restoration projects in the County in order to eliminate pollutant flows into the Indian River Lagoon National Estuary and the St. Lucie River.
- Policy 8.1.2.9 St. Lucie County shall restrict the construction of artificial waterways (canals) which provide access to any of the rivers, streams, creeks, canals, or other waters of the State or their tributary systems for the purposes of navigation, aesthetics, recreation, and or enhancement of property.

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Policy 8.1.2.10 The County shall maintain, and where unacceptable, improve surface water quality within St. Lucie County according to South Florida Water Management and Florida Department of Environmental Protection regulations and standards.

Policy 8.1.2.11 St. Lucie County shall support and assist with projects that further the South Florida Ecosystem Restoration Initiative goals to restore and maintain ecosystem elements most resembling natural, healthy functions of a complex balanced aquatic system.

Objective 8.1.3 The County shall continue to enforce land development regulations which require the protection and maintenance of the natural functions (flow and storage) of the 100-year floodplain.

Policy 8.1.3.1 The County's land development regulations shall include the use of programs to protect or maintain floodplain, such as reduced parking, conservation easements, cluster site planning and micrositing of buildings. The County shall continue to strictly enforce regulations that direct development away from floodplains and provide upland buffers along the floodplain.

Policy 8.1.3.2 The County shall continue to acquire floodplain through the Environmentally Significant Lands Program and cooperative agreements with state and federal acquisition programs.

Policy 8.1.3.3 Appropriate floodplain management initiatives for unincorporated areas which may impact or be beneficial to other areas within the watersheds shall be developed.

Objective 8.1.4 The County shall continue to enforce Wetland Protection Standards within the land development regulations which require the preservation, creation and restoration of wetlands in a manner that results in no net loss of function and value within the County's jurisdiction.

Policy 8.1.4.1 The land development regulations shall require the following information on site plans for new development:

- a. The location and extent of wetlands located on the property;
- b. Measures to assure that normal flows and quality of water will be provided to maintain wetlands after development; and
- c. Measures to mitigate for any unavoidable wetland impacts proposed as part of the development.

Policy 8.1.4.2 The land development regulations shall provide criteria for:

- a. Project modification measures to reduce wetland loss and degradation. All projects shall be required to maximize design modifications to ensure wetland impacts are

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avoided or minimized;

- b. The evaluation of proposed wetland alteration for permitted uses;
- c. The mitigation of wetlands alteration which include, but are not limited to, the restoration of disturbed wetlands, creation of additional wetlands, or enhancement of functions and values provided by existing habitats.

Policy 8.1.4.3 The County shall continue to require a minimum fifty (50) foot buffer zone of native upland and transitional vegetation along rivers, creeks, and estuaries, to be maintained from the landward extent of state waters or from Mean High Water of the rivers, creeks, and estuaries; whichever is greater. However, setbacks for the North Fork of the St. Lucie River shall be governed by those set out in the Land Use Element.

Policy 8.1.4.4 The land development regulations shall require a buffer zone of native upland edge (i.e, transitional) vegetation to be planted or maintained around wetland and deepwater habitats which are constructed or preserved on new development sites. The buffer zone may consist of preserved or planted vegetation but shall include canopy, understory, and ground cover of native species only. The edge habitat shall begin at the upland limit of any wetland or deepwater habitat. As a minimum ten square feet of such buffer shall be provided for each linear foot of wetland or deepwater habitat perimeter that lies adjacent to uplands. This upland edge habitat shall be located such that no less than 50 percent of the total shoreline is buffered by a minimum width of ten feet of upland habitat.

Policy 8.1.4.5 The County shall cooperate with the Florida Department of Environmental Protection, South Florida Water Management District (SFWMD), and the U.S. Army Corps of Engineers on their dredge and fill permitting responsibilities by providing comments where appropriate on any applicable County wetland regulation.

Policy 8.1.4.6 The land development regulations shall include the use of programs to protect or maintain wetlands, such as reduced paving, conservation easements, cluster site planning and

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micrositing of buildings.

Policy 8.1.4.7 The County shall provide appropriate administrative support in the acquisition of additional wetlands and uplands as part of the Savannas State Reserve.

Policy 8.1.4.8 The County shall support wetland mitigation programs by federal and state agencies that will not weaken local regulatory authority and will ensure no net loss of wetland functions and provide for a measured increase in restored wetland function and acreage. Any wetland impact occurring within St. Lucie County shall be mitigated within St. Lucie County, unless waived by the Board of County Commissioners.

Policy 8.1.4.9 The County shall continue to identify and analyze wetland areas which should be considered environmentally sensitive. The County shall provide for the protection, appropriate use and conservation of these areas based on criteria which consider the administrative and fiscal constraints of the County. Potential mechanisms shall include acquisition, restriction or prohibition of activities, and incentives to protect and maintain wetlands.

Policy 8.1.4.10 No new untreated point source discharges into estuarine and coastal waters, for stormwater run-off, will be permitted.

Policy 8.1.4.11 The County shall require that setback requirements from open bodies of water are maintained by continued implementation of the Land Development Regulations.

Policy 8.1.4.12 The County shall require the identification of on site wetlands for all new applications for development or construction. Protection of wetlands and other surface waters is preferred to destruction and mitigation due to the temporal loss of ecological value and

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uncertainty regarding the ability to recreate certain functions associated with these features. Mitigation will be considered only after the applicant has complied with the land development code requirements regarding the avoidance and minimization of wetland impacts. In certain cases, mitigation cannot offset impacts sufficiently to approve a project. Such cases may include activities which degrade Outstanding Florida Waters, adversely impact habitat for listed species, or impact wetlands or other surface waters not likely to be successfully recreated. The current condition and value of wetlands functions will be considered in determining if proposed adverse impacts and mitigation measures to off-set wetland impacts are reasonable.

Policy 8.1.4.13 The County shall require that all on-site wetlands be preserved unless the applicant demonstrates that practicable use of the property cannot otherwise occur. If wetland impacts are determined unavoidable, wetland mitigation shall first be provided on-site to the maximum extent possible prior to considering offsite mitigation. All wetlands and adjacent buffers preserved on the development site shall be protected by a conservation easement that is dedicated to a government agency or other entity acceptable to the Board of County Commissioners. Said conservation easement shall provide for the protection and perpetual maintenance of the wetland.

Policy 8.1.4.14 When it is determined that a wetland violation has occurred, restoration shall be required before any development permits are issued, or within 90 days, whichever occurs first.

Policy 8.1.4.15 The County shall conduct a study to identify wetland areas of special concern, and special protective measures to ensure that the biological, scenic qualities of these wetland areas are maintained.

Objective 8.1.5 The County shall continue to enforce land development regulations which require the conservation, appropriate use, and protection of the quality and quantity of groundwater.

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- Policy 8.1.5.1 St. Lucie County shall enforce the Well Field Protection program standards, including:
- a. Assure adequate and safe water supplies to present and future citizens of the County;
 - b. Comply with Federal and State regulations in the best interests of the County and its future growth and development;
 - c. Avoid crisis water supply situations through careful groundwater resources planning and conservation;
 - d. Identify and protect the functions of public well field areas, including recharge of those areas, and provide incentives to keep the present and future public well fields compatible with the needs expressed in a. above;
 - e. Ensure that new development is compatible with existing local and regional water supply capabilities; and
 - f. Protect present and future public well fields against depletion and contamination through appropriate regulation, incentives, and cooperative agreements.
- Policy 8.1.5.2 St. Lucie County shall cooperate with federal, state, and local agencies in monitoring groundwater levels and quality.
- Policy 8.1.5.3 St. Lucie County shall request appropriate administrative and financial support from the SFWMD to identify potable water supply areas. Upon completion of such a study, identified areas shall be presented to the County Commission to be adopted as an amendment to the Land Development Code along with policies to protect the functions of these areas, such as maximizing stormwater retention to minimize drainage.
- Policy 8.1.5.4 St. Lucie County shall continue to cooperate with SFWMD to properly seal unpermitted active drainage wells and abandoned free- flowing artesian wells.

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Policy 8.1.5.5 The County shall conduct a study to identify existing and potential threats to the quality of waters within the Taylor Creek Wellfield Protection Area. The study shall be forwarded to the Board of County Commissioners with recommendations for any corrective measures required to safeguard the Taylor Creek Wellfield Protection Area.

Objective 8.1.6 The County shall protect and conserve the natural functions of soils which includes, at a minimum, the following policies and regulations.

Policy 8.1.6.1 The County shall require through the land development regulations the consideration of hydrologic, topographic, and vegetative cover factors in the site plan review process of proposed developments.

Policy 8.1.6.2 The County shall enforce regulations which prohibit the use of off-road vehicles in areas identified as environmentally sensitive pursuant to policies under Objective 8.1.12 or that are subject to soil erosion. For the purposes of this policy, the Savannas State Reserve, Atlantic Coastal Ridge, and dunes on Hutchinson Island shall be considered environmentally sensitive.

Policy 8.1.6.3 Assist the St. Lucie County Soil and Water Conservation District in those activities directed at minimizing soil erosion.

Policy 8.1.6.4 The County shall coordinate with other agencies and organizations to initiate a data collection program to acquire water quality and turbidity information at five year intervals, as it relates to soil erosion.

Policy 8.1.6.5 Clearing of native vegetation on newly platted subdivision lots prior to the issuance of a building permit for construction on the single family lot shall be limited to that which is

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necessary for roads, utilities installation and drainage.

Objective 8.1.7 The County shall continue to regulate mining to ensure the conservation, appropriate use, and protection of minerals in a manner that safeguards all of the County's remaining natural resources, including ground and surface waters and upland plant communities.

Policy 8.1.7.1 The land development regulations shall include criteria developed as a result of a continuing monitoring and evaluation program of the County's drainage systems, wetlands, and other surface waters. Mechanisms to maintain the functioning of drainage systems, wetlands, and surface waters that existed prior to resource extraction shall be developed.

Policy 8.1.7.2 The land development regulations shall include locally determined criteria for buffers which address sight, sound, and airborne particulate matter between resource extraction activities and adjacent existing and future land uses. The airborne particulate matter criteria shall also address trucking operations access points to be utilized as part of the mining operation.

Policy 8.1.7.3 The land development regulations shall include locally determined criteria which specifies suitable conditions for reclamation. These criteria shall address the potential for landforms capable of supporting diverse and beneficial land uses, time limits on implementation of reclamation, revegetation to minimize wildlife habitat lost, and shoreline treatments for water bodies which address appropriate safety and environmental considerations.

Policy 8.1.7.4 The land development regulations shall encourage the use of recycled materials for roadway construction, where practicable.

Policy At a minimum mining shall not be permitted in the following environmentally sensitive

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- 8.1.7.5 areas:
- a. The North and South Savannas;
 - b. Atlantic Coastal Ridge;
 - c. Within any identified environmentally sensitive area or within two hundred (200) feet of such an area;
 - d. Coastal High Hazard Area;
 - e. Hutchinson Island; or
 - f. Environmentally sensitive areas as defined under Objective 8.1.12.

Objective 8.1.8 The County shall protect native upland habitats, and shall prevent the net loss of listed species and their habitat. This shall be accomplished through the County Environmentally Significant Lands Acquisition program, ongoing natural resource protection programs and the implementation of land development regulations.

Policy 8.1.8.1 The County shall require all nuisance and invasive exotic vegetation (e.g. Brazilian pepper, Australian pine and Melaleuca) be removed and eradicated at the time of development or redevelopment of a non-residential use and residential site plan projects and, where appropriate, replaced with native or drought tolerant species that are adapted to existing soil and climatic conditions.

Policy 8.1.8.2 The County shall require the protection of endangered and threatened plant and animal populations and the conservation of the native habitat, including intact canopy, understory and ground cover; upon which these populations depend for survival. Possible mechanisms would include:

- a. Assisting in the application of and compliance with federal and state regulations;
- b. Consulting with appropriate federal and state agencies during development reviews
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- c. Establishing management programs with incentives for private landowners to protect or conserve habitats, such as reduced parking, landscaping, or credit for park and recreation impact fees;
- d. Using conservation easements, cluster site planning and micrositing of buildings; and
- e. Assisting the state in developing an education program to promote the preservation of endangered and threatened species.

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Policy 8.1.8.3 Lands acquired through the County's Environmentally Significant Lands Program for preservation shall be preserved and managed for the long term viability of the listed species

Policy 8.1.8.4 The land development regulations shall include criteria which allow utilization of Transfer of Development Rights (TDRs) or other flexible methods of land development transfer that would direct development from unsuitable lands to those most suitable for active use.

Policy 8.1.8.5 The County shall require all development, to proceed in a manner compatible with the conservation of wildlife and natural systems. All lands within development sites proposed as conservation and open space areas shall be held in single-ownership by a homeowners association or other entity that will be responsible for the long-term maintenance of the conservation or open space area. Open space and conservation areas shall not include lands utilized to meet the minimum lot size requirements.

Policy 8.1.8.6 The County shall require the use of native or drought tolerant vegetation adapted to existing soil and climatic conditions in landscaping.

Policy 8.1.8.7 St. Lucie County shall review as part of each Evaluation and Appraisal Review of the Comprehensive Plan, beginning in scheduled review of 2007, the existing criteria and standards for the protection of the remaining native plant communities within the County. For the purpose of this plan, native plant communities shall be preserved in viable condition with intact ground cover, understory and canopy. The criteria and standards shall include the preservation of viable native plant communities occurring within areas required to be maintained in order to meet other minimum development standards, such as setback, open space and landscaped areas.

Policy The County shall require the submission of an environmental impact report, which addresses

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8.1.8.8 concerns for habitat preservation and species protection for projects greater than ten acres, or that are located on the barrier island, the Atlantic Coastal Ridge, or are adjacent to public conservation lands.

Policy The County shall acquire and support the public acquisition of a diversity of natural
8.1.8.9 habitat types to ensure maximum diversity of native wildlife species.

Policy Land use decisions shall consider the effects of development impacts on fish, wildlife and
8.1.8.10 habitat and the cumulative impact of development and redevelopment upon wildlife habitat. In cases where rare, endangered, threatened or species of special concern are known to be present, a condition of approval will be that a management plan prepared and approved by appropriate state and federal agencies be completed prior to development approval. Classification of listed fish, wildlife and habitat is defined by the Federal government, the State of Florida, including the Florida Fish and Wildlife Conservation Commission and the Florida Natural Areas Inventory. In addition, this policy shall apply to any species or native habitat the Treasure Coast Regional Planning Council determines to be regionally rare, endangered or threatened with extinction. To ensure adequate protection, protected plants and animals, which cannot be provided with sufficient undisturbed habitat to maintain the existing population in a healthy, viable state on site, shall be effectively relocated in accordance with local, state and federal regulations.

Policy The County shall continue to support the County Land Acquisition Selection Committee whose
8.1.8.11 function is to utilize the 1992 Upland and Wetland Inventory and federal, state, and local resources, to formulate a master acquisition list of lands having native upland habitat. The overall objective is to ensure the preservation of a minimum of 12,500 acres of the 1992 remaining native upland habitat, with the highest priority being those classified as endangered or threatened as well as those properties having habitats that are facing destruction as a result of urban development and which recognizes relationships to those areas of native habitat already under public and/or private preservation,

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Policy 8.1.8.12 The County shall, by July 1, 2001, reappoint a Land Acquisition Finance Committee whose function shall be to develop a recommendation as to how to fund the master acquisition list formulated pursuant to Policy 8.1.8.11. The Committee may be organized as a subcommittee of the Land Acquisition Selection Committee. The Committee shall monitor the current and future finances of the Environmentally Significant Lands program.

Policy 8.1.8.13 The County shall continue to request assistance in public acquisition of natural areas under federal, state and regional programs including, but not limited to Preservation 2000, Florida Forever, Florida Communities Trust, Conservation and Recreation Lands, and Save Our Rivers programs.

Policy 8.1.8.14 The County shall provide multiple use opportunities on County-owned natural preserve areas, consistent with natural resource protection and conservation, to provide for passive recreation, wildlife habitat, watershed protection, erosion control, maintenance or enhancement of water quality, aquifer recharge protection, or other such functions.

Policy 8.1.8.15 The land development regulations shall provide that existing on-site native upland habitat be incorporated into required site plans as a part of open space areas in lieu of the installation of new plant materials to meet the minimum site plan requirements.

Policy 8.1.8.16 The County shall require clustering of dwelling units and/or open space for land development projects which contain environmentally sensitive lands and critical habitats within its project boundaries, in order to preserve these resources.

Policy 8.1.8.17 Habitats supporting endangered and threatened species should be preserved, protected and managed so as to continue the value of the habitat to the endangered and threatened species found to be dependent on it.

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Policy 8.1.8.18 The County shall consider the abundance, status, and distribution of endangered ecosystems and other environmentally sensitive lands when reviewing land use proposals and acquisitions.

Policy 8.1.8.19 St. Lucie County shall assist to prevent the destruction of Florida's Cypress Strands through Land Development regulations that prohibit the use of Cypress Mulch for any non-residential landscaping areas or projects. The use of cypress mulch is also to be discouraged on all residential projects.

Objective 8.1.9 The County shall develop a hazardous waste management program for the proper recycling, storage, collection, and disposal or transfer of hazardous materials and wastes.

Policy 8.1.9.1 The County shall establish a storage transfer facility for household and small quantity generators of hazardous wastes.

Policy 8.1.9.2 The County shall develop emergency response plans to handle accidents involving hazardous materials or wastes.

Policy 8.1.9.3 The County shall continue the recycling program which includes public education on the beneficial use of hazardous wastes using publicized lists of approved recyclers and by subscription to the Southern Waste Information Exchange.

Policy 8.1.9.4 The County shall continue to support State sponsored Amnesty Days to collect hazardous wastes in the County; and shall evaluate the need for scheduling local Amnesty Days.

Policy 8.1.9.5 The County shall implement an employee training program to properly identify and inspect wastes before they enter the landfill and implement an inspection or screening program to

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exclude hazardous items such as drums, tanks from unknown sources, waste pesticides, or chemicals from spill cleanups.

Policy 8.1.9.6 The County shall participate with the FDEP and other local governments in the region to develop a regional hazardous waste transfer and storage facility and collection network, if appropriate.

Policy 8.1.9.7 The County shall seek funding from FDEP's Local Hazardous Waste Collection Grants Program to manage hazardous wastes.

Policy 8.1.9.8 The County shall conduct a Countywide underground storage tank assessment and assist any owner in seeking funding to respond to any groundwater contamination resulting from leaking tanks.

Policy 8.1.9.9 The County shall continue a public education program regarding household hazardous wastes, the proper methods of their disposal and alternative non-hazardous substitutes in cooperation with schools, news media, and civic organizations, and in conjunction with Amnesty Day awareness programs.

Objective 8.1.10 The County land development regulations shall require the conservation, appropriate use and protection of current and projected potable water sources.

Policy 8.1.10.1 The County shall prepare and adopt an emergency water management conservation plan in cooperation with SFWMD.

Policy The land development regulations shall require wastewater reuse plans for new sewage treatment plants operating above 250,000 gallons per day. Any new reuse plan shall be

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8.1.10.2 approved by FDEP.

Policy The County shall implement a public education program regarding various methods of water
8.1.10.3 conservation at the household and small business level.

Objective 8.1.11 St. Lucie County shall promote the protection of natural buffer areas to lessen the adverse effects which adjacent developments might have on the managed conservation areas, such as the Savannas State Preserve, Ft. Pierce Inlet State Park, and lands purchased for preservation purposes through Federal, State and local land acquisition programs.

Policy St. Lucie County shall cooperate with the FDEP in their management programs that provide
8.1.11.1 for the protection of native habitats within the County.

Policy All appropriate land development regulations required by this Comprehensive Plan shall
8.1.11.2 include the protection of native habitats, including those identified in the Recreation and Open Space Element.

Policy Proposed land use activities adjacent to public natural area conservation and recreation
8.1.11.3 lands, shall be limited to activities that will not degrade the natural physical, biological, aesthetic, or recreational functions of such lands.

Policy Land use applications, including site plan removal and construction permit application
8.1.11.4 materials, shall identify public and semi-public conservation and recreation lands on or adjacent to the development site.

Objective 8.1.12 The biodiversity of the County's natural areas shall be protected and enhanced through public land acquisition, conservation easements, land development regulations, and

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implementation of Management Plans prepared for public owned and managed natural areas. The County shall enact, enforce, and continually review and update land use regulations and land management plans that provide for the protection of natural resources.

Policy 8.1.12.1 The County shall continually evaluate the Resource Protection Standards section of the land development regulations and update any portion of the standards that do not adequately protect the County's natural resources.

Policy 8.1.12.2 All appropriate land development regulations required by this Comprehensive Plan shall include the protection of environmentally sensitive upland and wetland areas.

Policy 8.1.12.3 St. Lucie County will continue to cooperate with adjacent local governments to conserve, appropriately use, or protect ecological greenways located within more than one jurisdiction.

Policy 8.1.12.4 In addition to other conservation policies, any proposed development situated within Imperiled and Critically Imperiled vegetative communities, as defined by the Florida Natural Areas Inventory, including but not limited to scrub, maritime hammock, coastal dune; and all jurisdictional wetlands shall be considered Environmentally Sensitive Areas for conservation, appropriate use, and protection to further the goals, objectives, and policies of this Element and County land development regulations. Development proposals within these areas shall adhere to the following conditions:

a) Proposed development projects within a defined Environmentally Sensitive Area, as described above, must submit as part of the site plan approval process an Environmental Assessment Report. The report shall contain:

1. An inventory of existing vegetation and wildlife based on a field survey;
2. An identification of wildlife or vegetation listed as endangered, threatened or a

- species/plant of special concern:
3. An assessment of the land that will identify the location of all environmentally sensitive habitat or vegetation and will contain a plan to protect the resource;
 4. An analysis of the functional viability and quality of the various habitats;
 5. A discussion of the impacts, both positive and adverse, on the resources;
 6. A discussion of how the proposed development plan maximizes efforts to avoid and minimize adverse impacts to the environment;
 7. A discussion concerning whether there is any potential for irreplaceable or irretrievable environmental damage; and
 8. If reasonable use of the property cannot occur without adversely impacting on-site natural resources, a mitigation plan shall be required that describes actions to be taken that replace those functions and values of the resource as a result of impacting the resource.b) Those Environmentally Sensitive Areas identified as worthy of preservation may require a clustering of allowable density to more suitable areas for development. Only footpaths or entryways will be permitted in such areas.

Policy 8.1.12.5 Proposed site clearing activities within the known range of endangered or threatened species or where such species are expected to occur based upon habitat suitability and species ranges shall be surveyed by qualified environmental consultants and/or government ecologists prior to approval and commencement of such activities to determine whether or not populations of endangered, threatened or plant and animal species of special concern occur.

Policy 8.1.12.6 Where feasible, the County shall protect critical habitat through acquisition, establishment of public or private conservation easements, purchase of development rights, or through other available means as deemed appropriate.

Policy 8.1.12.7 No fill or regrading of property shall be allowed except to establish required road elevations for driveways, unless the environmental assessment shows that fill or regrading will not adversely affect the environment and fill is available on site.

Policy 8.1.12.8 All native upland and wetland habitats, including Environmentally Sensitive Areas as defined in Policy 8.1.12.5, to be preserved as part of a development project shall be protected through a conservation easement or other method acceptable to the County. The proposed preservation areas shall be designated on all site plan and permit application materials.

Policy 8.1.12.9 St. Lucie County shall support nature based eco-tourism activities on public preserves that are primarily designed for appreciation of the County's native habitats and wildlife species that can be accomplished in a manner that does not disrupt wildlife or negatively impact their habitat. The type of recreational activity deemed appropriate for the County's public preserves will depend on the type of native vegetative community on the site. This includes, but is not limited to, hiking, wilderness camping, canoeing, swimming, and wildlife viewing. Activities centers, including, educational centers, museums, and botanical centers will be provided at suitable locations throughout the County. All eco-tourism facilities shall be operated in a manner that does not degrade or reduce the inherent natural functions and values of the natural resources utilized for the eco-tourism use. County owned or managed lands purchased through public land acquisition programs targeting the protection of the natural resources shall only provide access and recreational opportunities that can be provided without degradation of the native plant communities and listed plant and animal species values.

Policy 8.1.12.10 Lands purchased through the County's Environmentally Significant Lands program shall be monitored for visitor impacts which threaten natural areas. If impacts to natural areas are identified a plan shall be prepared to mitigate or eliminate the negative impacts.

Objective 8.1.13 The County shall develop a greenway plan to facilitate the implementation of ecological and recreational greenways within its jurisdiction. At a minimum the plan shall include a map of existing and proposed greenways, identify gaps in the greenway network, and set forth strategies for the maintenance and expansion of the existing network.

Policy 8.1.13.1 The County shall coordinate with the state and federal land acquisition programs to encourage connectivity between privately and publicly owned recreational and conservation lands.

Policy 8.1.13.2 The County shall pursue grants from local, state, federal, and private organizations to plan and assemble the greenway network.

Policy 8.1.13.3 The County shall encourage multi-use of greenways, as appropriate, to facilitate the development of shared recreation and wildlife corridor ecological greenways.

Policy 8.1.13.4 The County shall establish guidelines within the Land Development Code that facilitate usable open space that is accessible to cyclists and pedestrians. Non-paved bicycle and pedestrian access shall be encouraged between uses where paved access would negatively impact existing habitats.

Policy 8.1.13.5 The County shall develop a beautification and improvement program for areas used by the general public (e.g. roads, sidewalks, bicycle paths, pedestrian walkways, parks and open space areas) to enhance vehicular and non-vehicular movements. The program shall encourage planting standards that promote the use of appropriate native plants in road and utility rights-of-way to restore the original native plant community to the extent practicable.

Policy 8.1.13.6 The County shall utilize, where possible, existing rights-of-way as wildlife corridors and pedestrian areas.

Policy 8.1.13.7 The County shall coordinate with appropriate state and federal agencies to identify natural area greenways and wildlife corridors to link existing public parks, preserve areas and similar areas for conservation and habitat preservation purposes.

Policy 8.1.13.8 The County shall consider incentives that encourage the granting of conservation easements for natural linear greenways and/or scenic drives.

Policy The County shall support the reconnection of impounded wetlands to the Indian River Lagoon to improve the productivity of estuaries; and the implementation of adaptive management

8.1.13.9 strategies for saltwater marshes and mangrove systems which are consistent with Best Management Practices for mosquito control.

Policy The County shall promote the maintenance of native plant communities in a contiguous manner
8.1.13.1 to provide wildlife corridors and pedestrian pathways.

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Objective 8.1.14 St. Lucie County shall, by December 2004, amend its land development regulations to include a locally developed and regulated wetland classification system for purposes of protecting wetland functions and values within the unincorporated areas of St. Lucie County based upon a wetland classification survey of all areas in the unincorporated areas of St. Lucie County to be completed by July 2004, consistent with the Policies cited below.

Policy As a part of the locally developed and regulated wetland classification system described in Objective 8.1.14. St. Lucie County shall use the following general
8.1.14.1 classification system for the purposes of protecting wetland functions and values within the unincorporated areas of St. Lucie County. This classification system is to include a qualitative assessment of the value of the wetlands and shall be based upon the standard WRAP analysis methods employed by the State of Florida.

- a) Category I wetlands - shall include any wetlands having hydrological connection to natural surface water bodies; any isolated wetland 20 acres or larger; or wetlands containing Strategic Habitat Conservation Areas as identified by the Florida Wildlife Conservation Commission.
- b) Category II wetlands - shall include any isolated wetlands which have been connected to other surface water drainage and are greater than or equal to five acres, or are less than 20 acres and do not qualify as Category I wetlands;
- c) Category III wetlands - shall include isolated wetlands less than five (5) acres that do not qualify as Category I or II wetlands.

St. Lucie County shall require identification of Category I, II, and III wetlands prior to staff review of all land development proposals, including future land use, zoning, site plan or construction applications. Except for those development proposals seeking a Final Development Order approval, as defined under Policy 11.1.3.6, a formal jurisdictional line determination shall not be required as part of this review.

St. Lucie County shall, by December 2004, amend its land development regulations to provide for the implementation of standards and regulations to enforce this policy.

Policy The County shall not permit development in a Category I or II wetland or any wetland buffer associated with these wetlands, except as follows:
8.1.14.2

- a) Clearing and /or constructing of walking trails;
- b) Construction of boardwalks/catwalks for direct access to water bodies; construction of wildlife management shelters, footbridges, observation desks and similar structures not requiring a dredge or fill for their placement; and

- c) Clearing and/or construction of electric/ cable utility, stormwater management, water or wastewater infrastructure as needed to provide public service that does not impair the long term viability of the wetland system.
- d) Alteration is permissible within Category I and II wetlands, and the required wetland buffer. as necessary for the above activities if:
 - 1. No other reasonable alternative exists and avoidance cannot be achieved;
 - 2. Such activity is consistent with other policies of the Comprehensive Plan;
 - 3. Such activity complies with the requirements of all Federal, State and Local agencies claiming jurisdiction over wetland alteration and adequate mitigation of any adverse hydrological and physical alterations is provided.
 - 4. No more than 1 percent of any Category I wetland is impacted, except as noted in Policy 8.1.14.3;
 - 5. No more than 15 percent of any Category II wetland is impacted, except as noted in Policy 8.1.14.3;
 - 6. Appropriate mitigation is provided.

Policy 8.1.14.3 In addition to the alteration provisions of Policy 8.1.14.3(c), alteration of a Category I or II wetland may be allowed when no other reasonable alternative exists and avoidance and minimization of impacts cannot otherwise be achieved. Any provision of this Comprehensive Plan or the land development code related to the preservation of a Category I or II wetland that precludes all reasonable economically viable use of the property or would prohibit a reasonable public use of the property and which if applied would result in a compensable taking of the property may be waived to the extent necessary to provide the minimum reasonable use, public or private, of the property. These provisions shall only be waived following the review and approval of the Board of County Commissioners, or their designee, in a manner set forth in the Land Development Code. The standards for the granting of any waiver shall be set forth in the Land Development Code and shall be consistent with the general standards and intent of the Comprehensive Plan

Policy 8.1.14.4 Alteration of a Category III wetland may be allowed when no reasonable alternative exists and avoidance and minimization of impacts cannot be achieved. Any provision of this Comprehensive Plan or the land development code related to the preservation of a Category III wetland that precludes all reasonable economically viable use of the property or would prohibit a reasonable public use of the property and which if applied would result in a compensable taking of the property may be

waived to the extent necessary to provide the minimum reasonable use, public or private, of the property. These provisions shall only be waived following the review and approval of the Board of County Commissioners, or their designee, in a manner set forth in the Land Development Code. The standards for the granting of any waiver shall be set forth in the Land Development Code and shall be consistent with the general standards and intent of the Comprehensive Plan .

Policy
8.1.14.5 The County shall require a minimum 50-foot buffer between Category I or II wetlands and new development activity in order to protect water quality, preserve natural functions, and preserve wildlife habitat. The buffer, as measured landward from the approved jurisdictional line, shall be maintained in a natural vegetative state and be free of exotic and nuisance species as defined by the Florida Pest Council.

Policy
8.1.14.6 All new development on lots less than 5 acres and not containing a Category I or II wetland shall provide a minimum 25-foot buffer between the wetland jurisdictional line and the area of development. The buffer, as measured landward from the approved jurisdictional line, shall be maintained in a natural vegetative state and be free of exotic and nuisance species as defined by the Florida Pest Council. No development shall occur within the wetland buffer except as identified in 8.1.14.2.

Policy
8.1.14.7 St. Lucie County shall assess the specific and cumulative impacts of all proposed new development or redevelopment activities, including single family building permits, on all wetlands that may be located on the property in order to ensure that the natural functions of the wetlands are protected and conserved through the implementation of wetland protection standards which shall include consideration of the types, values, functions, sizes, conditions, and locations of wetlands.

Policy
8.1.14.8 Removal, encroachment, or alternation of Category III wetlands may be allowed with the extent of such activities being determined on a case- by-case basis in conjunction with applicable regulatory agencies and in the interest of public benefit.

