CHAPTER 8

ST. LUCIE COUNTY
COMPREHENSIVE PLAN

CONSERVATION ELEMENT

Prepared by:

St. Lucie County
Board of County Commissioners

St. Lucie County
Department of Growth Management

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ST. LUCIE COUNTY
CONSERVATION ELEMENT

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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, District-wide Water Supply Assessment, 1998).

There is an increasing trend in the County to move towards use of the Floridan aquifer to reduce impacts on surface waters and wetlands, as well as provide a less drought sensitive supply. The Floridan Aquifer system ~~is primarily~~has historically been used as a backup source of agriculture irrigation water when rainfall is low and surface water from the major canals is not available (SFWMD, District-wide Water Supply Assessment, 1998). As agricultural areas are slowly converted into residential and commercial areas, the reliance on the Floridan aquifer for agricultural purposes decreases. Its quality is considered low with high concentrations of dissolved salts but can be utilized for public supply when treated with one of various membrane treatment processes, such as reverse osmosis. 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. Due to recent troubles with canker and greening disease, significant citrus acreage within the County is no longer active, but much still retains the land use designation of agricultural. According to the Indian River Citrus League (as of February 2008), an estimated 20,000 acres of active citrus groves exist within the County. The average water consumption per acre of citrus, assuming micro-irrigation, is 0.64 million gallons per year. The 2005-2006 update to the Upper East Coast (UEC) Water Supply Plan (SFWMD) estimates that agricultural water use will decrease by 7 percent over the 20-year planning horizon, while public supply demands will increase by 65 percent during the same period. Agriculture, however, is still anticipated to be the single largest user within the UEC planning area. In recent years, the coastal area of St. Lucie County 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~~recreational 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~~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%~~
~~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~~

St. Lucie County
Water Use Projected Demands

Urban and Agricultural Demands	**2000**	**2025**
Public Supply	17.7	61.8
Domestic Self-Supply	8.4	1
Commercial/Industrial	0.1	0.2
Recreational Self-Supply[1]	6.5	12
Landscape	*3.2*	*5*
Golf Course	*3.3*	*7*

[1]Recreational Self-Supply equals Landscape plus Golf Course

Source: 2006 Amendment to the SFWMD Upper East Coast Water Supply Plan

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 System~~s~~ 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
Surface water availability	Cumulative impacts (wetlands)
~~Floridian~~Floridan 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

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~~has proposed to retrofit this subdivision with improved stormwater controls.

St. Lucie County should continue it—'s 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 it—s support and participation in ~~state~~State and ~~federal~~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~~native vegetation landscape ordinance; adoption of a rain sensor ~~devise~~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~~native vegetation ordinance. Additionally, in November 2007, the County adopted an ordinance restricting the hours of irrigation to those times of day when evapotranspiration are minimized and irrigation is most efficient. This ordinance also allows the Board of County Commissioners to impose water restrictions, as

needed, during times when the SFWMD restrictions are not in effect (SFWMD supersedes County restrictions when in effect). 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. COMMERCIALLY 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 it=s 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 Amay 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)].