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# CONSERVATION AND COASTAL MANAGEMENT ELEMENT

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## INTRODUCTION

The purpose of a Conservation Management Element is ~~to~~ promote the conservation, use, and protection of natural resources. ~~The purpose of a Coastal Management Element is, including factors that affect energy conservation and~~ to protect human life and to limit public expenditures in areas that are subject to destruction by natural disaster. It is also to plan for, and where appropriate, restrict development activities where such activities would damage or destroy coastal resources. This Chapter contains the Conservation and Coastal Management elements and provides goals and policies concerning conservation of natural resources and the protection and resiliency of coastal areas.

The City of Port St. Lucie lies in St. Lucie County, an Atlantic Ocean coastal county located slightly south of the middle of the Florida peninsula. The County is composed of a mainland component, an estuarine lagoon, and a barrier island that is intersected by the Fort Pierce inlet. The City is in the southeast corner of the mainland portion of St. Lucie County with portions of the eastern limits of the City abutting the west shoreline of the estuarine lagoon. The North Fork of the St. Lucie River traverses the City and portions of the Savannas State Reserve, a large, unique freshwater coastal wetland, as well as a portion of the Atlantic Coastal Ridge fall within the City.

The coastal areas and natural resources of the City are dynamic and vulnerable resources, and are also essential components of the City's economic and social structure. Appropriate protection and management of the City's natural resources and coastal area increases community resiliency, mitigates hazard risk and supports the economic and social structure of the community.

## NATURAL ENVIRONMENT

### Climate

The Southeast Regional Climate Center has collected climate data from the City of Fort Pierce from 1901 through 201~~20~~, and from the Town of Stuart from 1935 through 20~~20~~. These communities lie just to the north and to the south, respectively, of the City of Port St. Lucie and provide relevant data. Data collection for Fort Pierce identifies the average annual maximum temperature is 82.1 F° and the average annual minimum temperature is 64.7 F°, with an annual total precipitation of ~~52.42~~52.36 inches. Data collection for Stuart identifies the average annual maximum temperature is ~~83.28~~ F° and the average annual minimum temperature is ~~65.96~~ F°, with an average annual total precipitation of 58.01 inches. Precipitation is not distributed evenly throughout the year. Precipitation ranges from an average monthly low of ~~2.15~~2.14 inches in December to ~~7.79~~7.81 inches in September for Fort Pierce, and an average monthly low of 2.50 inches in January to ~~8.91~~8.08 inches in September for Stuart. Precipitation is heaviest from June through September with nearly half of the annual rainfall occurring during these four months. No snowfall has been reported during this recording period.

Thunderstorms are common during the summer months. Hurricanes, much less frequent occurrences, have the potential to occur from June through November; heavy rainfall, high winds, and widespread flooding may accompany these storms. ~~Records, again tracked specific to Fort Pierce, identify that tropical storms or hurricanes have brushed or hit within 60 miles 52 times from 1871 through 2010. The most recent storm event occurred when tropical storm Fay passed to the northwest on August 20, 2008 with heavy rainfall causing flooding to many locations. The most recent storm event for the area was Hurricane Irma in September 2017 wind gusts of up to 100 miles per hour and rainfall of more than 20 inches.~~

## Soils

Map FLU-10 Soils, provides the general distribution of soils in the City as presented in the 1990 National Cooperative Soil Survey conducted by the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS). The following table provides a list of the soils mapped by the NRCS. Appendix 5-A. Soils Descriptions, provides the description, as provided by the Natural Resource Conservation Service (NRCS), of the soil series or land cover represented in the City.

**TABLE 5-1  
Soils and Land Coverage**

ANCLOTE SAND, DEPRESSIONAL	PEPPER AND EAUGALLIE SANDS
ANKONA AND FARMTON SANDS	PINEDA SAND
ANKONA – URBAN LAND COMPLEX	PITS
ARENTS, 0-5 PERCENT SLOPES	POMPANO SAND
ARENTS, 45-65 PERCENT SLOPES	POPLE SAND
BASINGER SAND	RIVIERA FINE SAND
CANAVERAL FINE SAND	RIVIERA SAND, DEPRESSIONAL
CHOBEE LOAMY SAND	SALERNO AND PUNTA SANDS
ELECTRA FINE SAND	SAMSULA MUCK
FLORIDANA SAND	SATELLITE SAND
FLUVAQUENTS, FREQUENTLY FLOODED	ST. LUCIE SAND
HILOLO LOAMY SAND	SUSANNA AND WAUCHULA SANDS
HOBE SAND	TANTILE AND POMONA SANDS
HONTOON MUCK	TERRA CEIA MUCK
JONATHAN SAND	URBAN LAND
KALIGA MUCK, DEPRESSIONAL	WABASSO FINE SAND
KESSON-TERRA CEIA COMPLEX	WABASSO SAND
LAWNWOOD AND MYAKKA SANDS	WATER
MALABAR FINE SAND	WAVELAND AND IMOKALEE FINE SAND
NETTLES AND OLDSMAR SANDS	WAVELAND-LAWNWOOD COMPLEX
OLDSMAR SAND, DEPRESSIONAL	WAVELAND URBAN LAND COMPLEX

PAOLA SAND	WINDER LOAMY SAND
PENDARVIS AND POMELLO SANDS	WINDER SAND, DEPRESSIONAL
PENDARVIS - URBAN LAND COMPLEX	WINDER SAND, SHELL SUBSTRATE

Source: 1990 National Resource Conservation Service (NRCS) SSURGO Soils Maps

### Physiography

The City of Port St. Lucie is identified by the U.S. Fish and Wildlife Service (FWS) as a part of an Upper East Coast sub-region; which includes St. Lucie, Indian River, Martin and the northern portion of Palm Beach County. This sub-region covers approximately 2,174 square miles and has an average elevation of 20 feet. The rise and fall of changing sea levels formed this area which is characterized by three, east to west, physiographic zones: (1) the Atlantic Coastal Ridge, (2) the Eastern Valley, and (3) the Osceola Plain. The Atlantic Coastal Ridge, bordered on the east by the Atlantic Ocean and on the west by the Eastern Valley, consists of relic dune ridges formed by wind and wave action along the coastline. Paralleling the east coast, the Ridge varies in width from a few hundred yards to a mile or two, and ranges in elevation from sea level to approximately 100 feet in Jonathan Dickinson State Park, the highest coastal elevation within this sub-region. In general, U.S. Highway 1 and the Florida East Coast Railway run along the Atlantic coastal ridge.

The City abuts the west shoreline of the Indian River Lagoon, an estuarine lagoon. Portions of the Savannas State Reserve, a unique freshwater coastal wetland, as well as a portion of the Atlantic Coastal Ridge fall within the City.

The North Fork of the St. Lucie River traverses the City in a north-south direction. The creation of St. Lucie Inlet in 1892 connected the Indian River Lagoon to the Atlantic Ocean at the mouth of the SLR. This project ultimately converted this freshwater tributary to a riverine estuary (freshwater in the upper reaches and saltwater in the middle and lower sections). This unique salinity gradient changed the natural resources found in the SLR. Because of its geographic location and the tidal connection through the St. Lucie Inlet, the North Fork supports high species diversity and serves as an important nursery ground for a variety of fish and wildlife.

Map FLU-3 Topography identifies the topography of the City. The City is relatively flat with elevations ranging from 0 to 35 feet. The vast majority of the City is at 20 feet. The lowest elevation is found along the North Fork of the St. Lucie River. The highest elevation is along the Atlantic Coastal Ridge.

### Soil Erosion

Due to the relatively flat topography of the City, and the protection the Barrier Island provides, soil erosion from typical geophysical conditions is generally not a problem in the mainland component of the County where the City lies. However, soil erosion and sedimentation can be a problem with large scale mining and agricultural operations if recommended Best Management Practices are not followed.

In the 1920's the headwaters of the North Fork the St. Lucie River were dredged for flood control and navigation. Spoil deposited along the newly-created channel isolated both floodplain habitat and oxbows from the original river course. This left canals with steep banks and narrow remains of floodplain habitats degraded by dense stands of non-native vegetation. These altered shorelines with diminished and degraded floodplain are susceptible to erosion and have created sedimentation problems along portions of the North Fork of the St. Lucie River. Restoration projects along the North Fork are proposed within a component of the federal Comprehensive

Everglades Restoration Program (CERP) identified as the *Indian River Lagoon - South Plan*.

## Commercially Valuable Minerals

Other than sand there are no commercially valuable minerals in the City. Currently, there are no active mining operations in the City.

## Floodplains

The following table lists and describes the flood zones within the City as identified by the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). The flood zones are shown on map FLU-4.

**Table 5-2  
Federal Emergency Management Agency Flood Zones**

<b>Zone</b>	<b>Description</b>
<b>A</b>	An area inundated by 1% annual chance flooding, for which no base flood elevations (BFE's) have been determined.
<b>AE</b>	An area inundated by 1% annual chance flooding, for which BFEs have been determined.
<b>AH</b>	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
<b>X</b>	Areas determined to be outside the 500-year floodplain, determined to be outside the 1% and 0.2% annual chance floodplains. Areas of minimal flood hazard from the principal source of flood in the area.
<b>X500</b>	Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. An area inundated by 0.2% annual chance flooding.

Source: South Florida Water Management ArchHydro Enhanced Database (AHED) Waterbody dataset, 4/29/2011.

Prior to development by man, the area that presently comprises St. Lucie County had drainage patterns that were controlled by major topographic features such as the Atlantic Coastal Ridge and more subtle features such as minor relict beach dunes (U.S. 1 south of Fort Pierce), Green Ridge (south central County), Osceola Plain (southwest County), Ten Mile Ridge (north central County), and overall a gentle slope from west to east (about 60 feet to about 5 feet). The alignment of these surface features generally parallels the existing coastline and thus traditionally served to impede sheetflow; the St. Johns Marsh, Allapattah Flats, and the Savannas were wetlands formed by these impediments. The Allapattah Flats and the south portion of the St. Johns Marsh slowly flowed east and south to form the headwaters of the North Fork of the St. Lucie River (NFSLR), which drained almost all of mainland St. Lucie County (450 sq. mi.). The Savannas normally percolated through the Atlantic Coastal Ridge to the Indian River, but during extremely high water stages there could be overflow to the North Fork of the St. Lucie River through Platts Creek. These wetland marshes stored water and provided recharge to the shallow aquifer.

Within the City of Port St. Lucie there were minor drainageways such as Howard Creek, Blakeslee Creek and Winters Creek, but the NFSLR was, and remains, the dominant drainage feature of both the City and the County. The NFSLR varies from 200 to 400 feet in width and meanders through a lush floodplain that is approximately one-half mile wide in the City. The floodplain has been subjected to very little development in the City and the Future Land Use Plan proposes continued restriction of floodplain development.

## Air

Based upon ambient air quality monitoring, conducted by the Florida Department of Environmental Protection (FDEP) and documented in the *2009–2019 Florida Air Monitoring Report*, Port St. Lucie, is an attainment areas for the six major air contaminants: carbon monoxide (CO), lead (Pb), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM), and sulfur dioxide (SO<sub>2</sub>). The attainment area designation indicates that the concentrations of major pollutants are within the acceptable limits set by the Florida Department of Environmental Protection and the U.S. Environmental Protection Agency. Air quality is a matter to be addressed at a regional level requiring local, County and regional entities to coordinate air quality maintenance and improvement efforts.

The Future Land Use element of this plan addresses strategies for reduction of greenhouse gas emissions.

### **Water Resources**

Map FLU-5 Water Bodies, locates the water bodies within and adjacent to the City. Most significant are the North Fork of the St. Lucie River (NFSLR) which traverses the City, and the Indian River Lagoon which abuts small portions of the eastern limits of the City. Within the City, the NFSLR is brackish and progresses from a riverine system to an estuarine system as it flows south. Major natural tributaries and embayments of the North Fork in the City are Long Creek, Mud Cove, Kitching Cove, Winters Creek, Blakeslee Creek, and Howard Creek.

*North Fork St. Lucie River.* The NFSLR is part of Florida's Save Our Rivers Program. Additionally, a portion of the North Fork is designated as an aquatic preserve and is also designated as Outstanding Florida Water pursuant to Chapter 62-302 F.A.C. The North Fork Aquatic preserve is bounded on the north by Midway Road and extends from Coconut Point in Stuart to Jenkins Point in Palm City just west of the Roosevelt Bridge in Martin County. The eastern and western boundaries of the preserve encompass the state-owned sovereign submerged lands occurring below the mean high water line to which the state holds title. The preserve is approximately 16 miles long through the natural riverbends and contains approximately 5,000 acres.

The North Fork is located in the Eastern Valley which is composed of long, low narrow ridges ranging from 15 to 30 feet in elevation. The natural topography of the watershed is generally flat with few natural rises. The hydrology of the North Fork and its headwaters was altered in the early to mid 1900s to support the growing demands of development and navigation. This began with a network of agricultural and residential canals and drainages. The canals were primarily designed to address flood control and drainage for land reclamation. Prior to these drainage efforts, the North Fork St. Lucie River (SLR) watershed encompassed 187 square miles. Construction of these drainage canals expanded the watershed to 821 square miles by diverting flows from other areas to the North Fork.

Another flood control and navigation project was conducted from the 1920s to the 40s to straighten portions of the North Fork. In the process of straightening the river, the dredged spoil was piled into berms (mounds) along the banks of the new channel. These spoil piles, which can measure up to 50 feet wide and 25 feet tall, block former river bends and oxbows as well as isolate a large portion of the North Fork floodplain. Historically, the slow and meandering path of the North Fork allowed suspended solids to settle out of the water and nutrients to be filtered by vegetation, but the direct river-course does not, which now affects the water quality and sediment loads reaching the estuary.

The creation of St. Lucie Inlet in 1892 connected the Indian River Lagoon to the Atlantic Ocean



at the mouth of the St. Lucie River (SLR). This project ultimately converted this freshwater tributary to a riverine estuary (freshwater in the upper reaches and saltwater in the middle and lower sections). This unique salinity gradient changed the natural resources found in the SLR. Because of its geographic location and the tidal connection through the St. Lucie Inlet, the North Fork of the river supports high species diversity and serves as an important nursery ground for a variety of fish and wildlife. The river now serves as an important breeding and nursery ground for migratory fish, such as snook (*Centropomus spp.*), snapper (*Lutjanus spp.*), and opossum pipefish (*Microphis brachyurus lineatus*) that require estuarine and freshwater to complete their lifecycle. The river is also especially important habitat for the juvenile phases of commercially important species such as blue crabs, snook, snapper, drum and shrimp. Rare tropical peripheral fish species, such as gobies, sleepers, and pipefishes, are also found in the upper reaches of the North Fork and the two headwaters - Five Mile Creek and Ten Mile Creek.

*Drainage Canals.* The C-24 canal traverses the City and the C-23 canal runs along the southern limits of the City. Overall, there are three major primary drainage and flood control canals in the County, the C-23, C-24 and the C-25 which are part of the Central and South Florida Flood Control project and are managed by the South Florida Water Management District (SFWMD). In addition, the Fort Pierce Farms Water Control District and the North St. Lucie River Water Control District manage numerous secondary canal systems. These canals are solely dependent on rainfall as a source of inflow and are important sources of agricultural irrigation water. 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. At this time all but a small area in southwestern and northeastern St. Lucie County is drained by these primary and secondary canal systems.

Alteration and expansion of the historic watershed coupled with ecologically-degrading land use practices have set the stage for the current impaired condition of the North Fork and most other SLR watershed basins. Prior to these manmade alterations, wet season rains pooled broadly across the SLR watershed and moved toward the naturally lower elevations surrounding the river. Historic wetland ecosystems facilitated dynamic watershed storage and sheet flow. Reduced movement through natural features kept wetlands flooded and provided for movement of groundwater to the river during the dry season. This made historic wetlands and estuaries less vulnerable to Florida's variable rainfall. Today, much of the watershed runoff from the North Fork drainage basins flows quickly from smaller, residential canals into large canals that cross the coastal ridge instead of being detained, evaporated, cleansed, and held by natural systems.

*The Savannas.* A unique freshwater ecosystem is located in a shallow catchment area between the steeper western slope of the Atlantic Ridge and the gentler slope to the eastern uplands. A large portion of this habitat is under public ownership and is referred to as The Savannas. A large portion of the 6,311 acre Savannas Preserve State Park, under the ownership and management of the State, falls within the City. Outside of the Savannas, inland freshwater wetlands and swamps also occur throughout the City.

*Indian River Lagoon.* Immediately interior to the coastal barrier island, located between the barrier island and the Atlantic Coastal Ridge, is the Indian River Lagoon (IRL). The IRL is a linear estuarine system that extends along more than a third of Florida's east coast, over 155 miles, from Ponce de Leon Inlet in Volusia County south to Jupiter Inlet in Palm Beach County. Numerous freshwater wetlands and sloughs undergo a transition into riverine systems that connect directly to the IRL. The lagoon interacts with the saline waters of the Atlantic Ocean through the inlets, providing tidal exchange with fresh water discharged into the lagoon from the inland rivers. Although only small portions of the eastern limits of the City abut the west shoreline of the Indian River Lagoon, due to the significance of this water body it is import to discuss this

estuarine system that lies in such close proximity to the City.

The IRL provides a higher species diversity than any other estuary in North America. Portions of the IRL have been designated as Aquatic Preserves. The *Jensen Beach to Jupiter Inlet Aquatic Preserve* extends from the southern corporate limits of Fort Pierce (St. Lucie County) south (through Martin County) to Jupiter Inlet (West Palm Beach County) and encompasses 22,000 acres. The aquatic preserve was adopted under Florida Statutes, Sections 258.35 – 258.46 by the State of Florida on October 21, 1969 and are managed by the Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas. The Preserve is listed in the Aquatic Preserve Rule, Chapter 18-20 Florida Administrative Code, and have also been designated as Outstanding Florida Water pursuant to Chapter 62.302.7 F.A.C. The IRL is one of only twenty-eight estuaries in the country in the Environmental Protection Agency's National Estuary Program.

A variety of organizations have monitoring and research underway in the IRL and its watershed. The Indian River Lagoon Surface Water Improvements and Management (SWIM) Program has been designed to develop and execute a combination of research and practical implementation projects to protect or restore the environmental resources of the Indian River Lagoon. This joint program, administered cooperatively through the St. John's River Water Management District (SJWMD) and the South Florida Water Management District (SFWMD), has three goals:

- Attain and maintain water and sediment of sufficient quality to support a healthy, seagrass-based estuarine ecosystem;
- Attain and maintain a functioning seagrass ecosystem which supports endangered and threatened species, fisheries and wildlife; and
- Achieve heightened public awareness and coordinated interagency management.

## Potable Water

On a regional level, The City of Port St. Lucie and St. Lucie County are located within the South Florida Water Management District (SFWMD). More specifically they are located in the District's Upper East Coast (UEC) Planning Area consisting of St. Lucie and Martin counties and eastern Okeechobee County with a boundary encompass over 1,230 square miles, and generally reflecting the watersheds of the C-23, C-24, C-25 and C-44 canals. [The 2016 Upper East Coast Water Supply Plan Update \(2016 UEC Plan Update\) and the 2006 Upper East Coast Water Supply Plan Amendment \(2006 UEC Plan Amendment\) provides details on the current and projected water supply for this planning area. The Executive Summary of the 2016 UEC Plan Update Amendment states:](#)

[The UEC Planning Area relies on groundwater from the surficial aquifer system \(SAS\) and Floridan aquifer system \(FAS\) for urban uses. In 2013, the SAS accounted for approximately 40 percent of public water supply \(PWS\) use in the UEC Planning Area, and the FAS accounted for the remaining 60 percent. SAS use for PWS is projected to increase very little if at all as the use of alternative water sources such as brackish water from the FAS increases.](#)

[Recreation and landscape irrigation, including golf courses is accomplished through a combination of water from surface water, the SAS, and reclaimed water. Additionally, the FAS is used as a supplemental source for some landscape and golf course irrigation. Development of the SAS has been maximized in many portions of the UEC Planning](#)



## Area.

Agriculture is a substantial part of the economy and the single largest water use category in the UEC Planning Area. Surface water from the C-23, C-24, C-25, and C-44 canals serve as the primary water source for agricultural uses. Additional use of water from these canals is restricted above existing allocations.

~~The 2004 Upper East Coast Water Supply Plan Update (2004 UEC Plan Update) and the 2006 Upper East Coast Water Supply Plan Amendment (2006 UEC Plan Amendment) provides details on the current and projected water supply for this planning area. The Executive Summary of the 2006 UEC Plan Amendment states:-~~

~~The UEC Planning Area's projected population growth over the next 20 years will significantly impact the region's public water demands, particularly in the urban sector. The UEC Region's total population is expected to increase from 320,664 in 2000 to about 584,927 residents by 2025. This estimate is 20 percent higher than the population estimate projected in the 2004 UEC Plan Update. Development of alternative water supplies will play a vitally important role in meeting water needs, as further development of traditional supplies becomes increasingly limited. While public water supply water withdrawal needs are projected to increase by 65 million gallons per day (MGD) with the region's projected rapid growth, and agricultural water demand is forecasted to decrease 7 percent, agriculture will remain the Upper East Coast Planning Area's largest water user. The largest percentage of change in urban water demand over the next 20 years will be in the thermoelectric power generation self-supply sector as three new power generation facilities are projected to be located in this region.~~

~~As a result of this water supply planning process, new public water supply capacity is expected to exceed Year 2025 demands. The utilities have identified sufficient projects to meet the projected water needs for the Year 2025, and projects specific to each major public water supplier are included in this plan amendment. Forty seven alternative water supply projects and one traditional water supply project were submitted by local utilities for this UEC Plan Amendment.~~

The sole source of potable water within the City is groundwater. The Potable Water Sub-Element focuses on the public and domestic self-supply demand for the City and provides specific data on the public water needs, sources, treatment, and distribution systems. Port St. Lucie contains wellfields and also has an adopted Wellfield Protection Ordinance. Map FLU-9 identifies the location of the wellfields. The potable Water Sub-Element outlines the geographic service areas of potable water service for the major regional facilities operating in the City which include the Port St. Lucie Utility Systems Department (Public), the St. Lucie West Services ~~Department~~ [District](#) (Private), and The Reserve (Private).

## **Ground Water**

The South Florida Water Management District identifies that agriculture is the major land use in the Upper East Coast (UEC) Planning Area, with citrus being the dominant crop. Water for urban and agricultural uses in the UEC Planning Area comes from three main sources: the Floridan Aquifer System (FAS), the Surficial Aquifer System (SAS) and surface water. Surface water from the C-23, C-24, C-25 and C-44 canals is used primarily for agricultural irrigation, with the FAS used as a backup source during periods of low rainfall. Public water supply wells draw groundwater from both the brackish FAS and some from the shallow unconfined SAS as the source for public water supply and urban irrigation. Withdrawals from the SAS have been maximized along the coast and alternative water supplies are being developed to meet the

growing water needs. These include the FAS as a source of drinking water and reclaimed water for irrigation water. The SAS and surface water are dependent upon rainfall for recharge.

There are four primary drainage canals in the UEC Planning Area that are part of the Central and Southern Florida Flood Control Project. These canals (C-23, C-24, C-25 and C-44) have also become important sources of irrigation water within their respective drainage basins. The C-44 is the only one of the four canals that receives inflow from outside its drainage basin. The C-23, C-24 and C-25 canals, by contrast, are solely dependent on rainfall as a source of inflow. As a result of the large demand for this limited surface water supply, there are prohibitions for any new or expanded water supply uses of these three canals.

The Floridan Aquifer is used by growers as a supplemental source when surface water availability is limited, and as a primary irrigation source when surface water is not available. In most cases, water from the Floridan Aquifer has a high salinity (relative to surface water) and has to be blended with surface water or water from the Surficial Aquifer before it is used for irrigation.

Currently, most of the public water supply for the region comes from the shallower Surficial Aquifer as it has better quality water. The Floridan Aquifer in the UEC Planning Areas is a relatively unused water source for public water supply, as it is located approximately 900 feet below land surface. However, the use of the Floridan Aquifer by utilities is increasing and most coastal utilities in the region plan to use the Floridan Aquifer to meet their future needs. Utilities either blend the Floridan water with fresh water or treat it using reverse osmosis.

Because of its diffuse and intermittent nature, stormwater is not generally considered a viable option for direct public-supply applications where reliability is a major consideration. Stormwater management practices that provide for increased soil infiltration and groundwater recharge opportunities should be considered as a means to protect and possibly enhance existing groundwater resources.

The following is a summary of water supply issues in the UEC Planning Area.

- Increased withdrawals from the Surficial Aquifer System are limited due to potential impacts on wetlands, as well as the increased potential for saltwater intrusion.
- Surface water availability in the C-23, C-24 and C-25 canals is not sufficient to meet existing and projected agricultural demands.
- Freshwater discharges (minimums and maximums) are affecting the health of the St. Lucie River and Estuary, southern Indian River Lagoon and the Northwest Fork of the Loxahatchee River.

## **Surface Water**

Compared to most groundwater sources, surface water sources generally are of lower quality. Surface waters tend to contain silts and suspended sediments, algae, dissolved organic matter from topsoil, and chemical and microbiological contaminants from municipal wastewater discharges, stormwater runoff, and industrial and agricultural activities. The quality of surface water may vary seasonally with variation in flow rates or water levels. Traditionally, surface water has not been used for public supply in the SFWMD.

## **Pollutants**

Waste generators, solid waste facilities, above and underground storage tanks, and dry cleaning

facilities are licensed and regulated by the Florida Department of Environmental Protection (FDEP). Current information on these facilities is available through the Florida Department of Environmental Protection Division of Waste Management. Information on contaminated sites is also available through the U.S. Environmental Protection Agency (EPA) Resource Conservation Recovery Act (RCRA), Superfund, National Priorities List and Brownfield databases.

A May ~~2011-2020~~ database search identifies that at this time there are no sites in the City listed on the U.S. Environmental Protection Agency’s (EPA) Federal Superfund list or the National Priorities List (NPL), and there are no brownfields in the City. Currently there are two sites within the City registered in the State Dry Cleaning Solvent Clean-up Program.

The City can discourage residential source contamination through close coordination with the Florida Department of Environmental Protection and by providing public information regarding the safe disposal of chemicals. Specifically, information can be made available on free disposal of household hazardous wastes, information on disposal contractors available to small businesses and the special waste programs available for landfill disposal of non-typical materials, such as spill clean-ups and contaminated soils.

The City of Port St. Lucie does not and has never operated a solid waste disposal facility within the City. However, there are two abandoned dump sites within the City that have been identified by the Department of Environmental Protection. One is in the northwest quarter of Section 7, Township 37, Range 41, on the east side of Lennard Road and approximately 1.75 miles south of Walton Road. This site was used by General Development Corporation for disposal of residential and commercial solid waste. The second site is in the northeast quarter of Section 20, Township 36, Range 40, on the west side of Airoso Boulevard approximately 1800 feet north of Floresta Boulevard. This site was used by various property owners to dispose of building materials and some garbage. The Department of Environmental Protection Sites List describes a "minimal potential problem" to these two dump sites. ~~The St. Lucie County Solid Waste Bailing and Recycling Facility is the location of solid waste & yard waste disposal per the current interlocal agreement with St. Lucie County. Currently all solid waste including yard waste generated within the City is disposed of at the Glades Road Sanitary Landfill as per an interlocal agreement with the County.~~

*Nuclear Power Plant.* The Florida Power and Light (FPL) St. Lucie Nuclear Power Plant is located on South Hutchinson Island, a barrier island in the southern portion of the County. The Power Plant is located only several miles from the eastern limits of the City. Nuclear energy production is monitored closely by the Nuclear Regulatory Commission, (NRC) a federal agency. Daily inspections are conducted at the St. Lucie Plant to guarantee compliance. Several identical safety systems are in place so that if one fails, others automatically go to work. In the unlikely event of an emergency, that could potentially result in the release of nuclear contamination, the environmental impacts could range from modest to catastrophic on a wide ranging, long term scale.

**Land Cover**

Map FLU-7 Habitats locates the habitat coverage within the City as recognized by the Florida Fish and Wildlife Conservation Commission (FWC). The table below provides the acreage and percentage of each of the habitat covers within the City.

**Table 5-3  
Habitat Coverage**

Habitat	Category	Acreage	Percentage
Citrus	Agriculture	14,515.05	76.81%

**Table 5-3  
Habitat Coverage**

Habitat	Category	Acreage	Percentage
Improved Pasture	Agriculture	3,327.76	17.61%
Other Agriculture	Agriculture	65.28	0.35%
Row/Field Crops	Agriculture	986.71	5.22%
Unimproved Pasture	Agriculture	2.45	0.01%
	<b>Category Total</b>	<b>18,897.24</b>	<b>25.61%</b>

Habitat	Category	Acreage	Percentage
Bare Soil/Clearcut	Disturbed/Developed	1,207.02	4.01%
Exotic Plants	Disturbed/Developed	2.47	0.01%
Extractive	Disturbed/Developed	13.61	0.05%
High Impact Urban	Disturbed/Developed	21,934.28	72.89%
Low Impact Urban	Disturbed/Developed	6,934.65	23.04%
	<b>Category Total</b>	<b>30,092.04</b>	<b>40.78%</b>

Cypress/Pine/Cabbage Palm	Native Habitats	131.60	0.76%
Dry Prairie	Native Habitats	4,583.62	26.39%
Grassland	Native Habitats	15.12	0.09%
Hardwood Hammocks and Forest	Native Habitats	932.78	5.37%
Mixed Pine-Hardwood Forest	Native Habitats	0.67	0.00%
Pinelands	Native Habitats	11,140.25	64.14%
Sand Pine Scrub	Native Habitats	80.67	0.46%
Shrub and Brushland	Native Habitats	474.88	2.73%
Xeric Oak Scrub	Native Habitats	9.37	0.05%
	<b>Category Total</b>	<b>17,368.96</b>	<b>23.54%</b>

Habitat	Category	Acreage	Percentage
Bay Swamp	Water & Wetlands	15.03	0.20%
Cypress Swamp	Water & Wetlands	184.22	2.48%
Freshwater Marsh and Wet Prairie	Water & Wetlands	2,530.05	34.01%
Hardwood Swamp	Water & Wetlands	1,111.10	14.93%
Mangrove Swamp	Water & Wetlands	557.59	7.49%
Mixed Wetland Forest	Water & Wetlands	52.88	0.71%
Open Water	Water & Wetlands	2,355.18	31.66%
Salt Marsh	Water & Wetlands	14.84	0.20%
Shrub Swamp	Water & Wetlands	618.77	8.32%
	<b>Category Total</b>	<b>7,439.66</b>	<b>10.08%</b>
<b>Grand Total Coverage Acreage</b>		<b>73,797.90</b>	

Source: Florida Fish and Wildlife Conservation Commission

Land coverage can broadly be categorized into Agricultural, Disturbed/Developed, Native Habitats, and Water/Wetland. As mapped, roughly 26% of the City falls under the Agricultural category, 41% is Disturbed/Developed, 23% is Native Habitats and 10% is Water/Wetlands. A variety of the historic native vegetative upland and wetland communities still exist; combined these occupy nearly a third of the City. Appendix 5-B Habitat Descriptions, provides a description, as provided by the FWC, of the habitats within the City.

The FWC map is not parcel based but looks at all habitats within the City limits; it does not exclude lakes, roadways, water bodies and public right of way lands. Therefore, it is important to note that the acreage identified by the FFWCC map will not directly correspond to the acreage totals established in future or existing land use maps, which are parcel based. Additionally, on the FWC map an individual parcel may contain multiple habitats, such as urban, pineland and open water.

## Natural Habitats

Imperiled and other animal species depend on native vegetative communities for refuge, foraging, nesting, and denning. The size, quality, and connectivity of native vegetative communities all influence wildlife utilization. Appendix 5-C. Listed Wildlife Species, identifies the listed wildlife species that may be found within the City.

Appendix 5-D. Native Plant Species, provides a list of native plant species having the potential to occur in the City, and identifies those that are recognized as either threatened or endangered by federal and State agencies.

Appendix 5-E. Invasive/Exotic Pest Plant Species, provides a list of the invasive exotic pest plant species that may occur in the City. Invasive exotic plant species have the capacity to disrupt, and displace native plant communities and associated dependent wildlife. The FWC recognizes and maps areas of invasive coverage in their habitat land coverage mapping program. The mapped invasive coverage within the City is limited to such a degree that only 0.01% coverage appears on the map.

## Conservation Opportunities

Conservation opportunities are enhanced through the public ownership of land. The City contains three major natural areas that are managed by the state for recreation and conservation use. These areas include the North Fork St. Lucie River Aquatic Preserve; North Fork St. Lucie River State Buffer Preserve; and the Savannas State Reserve.

The City of Port St. Lucie has a Conservation Lands Management and Acquisition Plan which includes an inventory of conservation lands currently under the City's ownership and an inventory of lands that are candidates for purchase under the City's Conservation Trust Fund Program. The City's Conservation Trust Fund was formally established in 1992 through the adoption of Chapter 157: Natural Resource Protection in the City's Land Development Regulations. The funding source for the Conservation Trust Fund is a one-time voluntary contribution that developers pay in lieu of preservation or land donation as established under Chapter 157.

In 1991, the St. Lucie Board of County Commissioners formed the Land Acquisition Selection Committee (LASC), which was charged with the task of preparing a proposal for public acquisition or protection of significant natural areas in the County. The LASC still serves as an advisory body to the Board of County Commissioners. In November, 1994, St. Lucie County voters approved a bond referendum authorizing issuance of ad valorem tax bonds, not to exceed \$20 million, to participate in state and federal land acquisition programs targeting the protection of natural areas. The St. Lucie County Environmental Lands project began in 1994 with the passage of this local bond program. On December 7, 1995, Spruce Bluff, a 97-acre site along the North Fork of the St. Lucie River, was the first site acquired through the Environmentally Significant Lands program. Since that time, over 7,355 acres have been acquired and more land has been identified for protection through public acquisition, including the Oxbow Eco-Center located in the City.

Additionally, the *IRL-South SWIM Plan* identifies that restoration of 2,984 acres along the North Fork St. Lucie River is proposed and that 1,600 acres were purchased and are managed by local, state, and regional agencies. Since 1994, the Conservation and Recreation Lands Program, the SFWMD Save Our River's Program, Florida Communities Trust, and the County's Environmental Lands program combined have spent about \$7 million on lands acquisition along the North Fork and over \$1 million on removal of exotic plants. The Recreation and Open Space



Element provides greater detail and lists the recreation and preservation lands within the City. The park and recreation sites in the City are located on map REC-1.

## **COASTAL RESOURCES**

### **Coastal Planning Area**

The City's coastal planning area is the area where the eastern limits of the City abut the Indian River Lagoon (IRL) and the areas in the City that abut the North Fork of the St. Lucie River (NFSLR). These locations are shown on map CST-1 Coastal Planning Area, and are generally described below.

There are two separate locations where the eastern limits of the City abut the IRL. The first consists of the corridor along Walton Road that terminates at the mean high water of the IRL. This is delineated by the City limits on the north, east and south and by the Florida East Coast railroad on the west. The second area is slightly north of this area and consists of the northeastern corner of the City limits that abuts the IRL. This area is also delineated by the City limits on the north, east and south, and by the Florida East Coast railroad on the west.

Additionally, the City includes in the coastal planning area the portions of the City that abut the NFSLR; and this too consists of two separate areas. The southern area is identified by the City limits on the north and on the south; and by the City limits and U.S. 1 along the east, whichever is westernmost. The western limit is delineated by S.W. Floresta, S. Bend Boulevard, S.E. Becker Road and the Florida Turnpike from the north to the south respectively.

The second area abutting the NFSLR is the northeastern corner of the City that abuts the NFSLR. This area is delineated by the City limits on the north, east and south and by N.W. James Drive and S.W. Airoso Boulevard along the west.

### **Natural Resources in the Coastal Area**

Immediately interior to the coastal barrier island, located between the barrier island and the Atlantic Coastal Ridge, is the Indian River Lagoon (IRL). The IRL is a linear estuarine system that extends along more than a third of Florida's east coast, over 155 miles, from Ponce de Leon Inlet in Volusia County south to Jupiter Inlet in Palm Beach County. Numerous freshwater wetlands and sloughs undergo a transition into riverine systems that connect directly to the IRL. The lagoon interacts with the saline waters of the Atlantic Ocean through the inlets, providing tidal exchange with fresh water discharged into the lagoon from the inland rivers. Along the IRL, the associated mangrove and salt marsh communities provide valuable filtration, stabilization and habitat and the seagrass beds provide foraging for manatees. Portions of the eastern limits of the City, as described above, lie adjacent to the IRL.

A unique freshwater ecosystem is located in a shallow catchment area between the steeper western slope of the Atlantic Ridge and the gentler slope to the eastern uplands. A portion of the 6,311 acre Savannas Preserve State Park falls within the City coastal planning area.

The St. Lucie River (SLR) is divided into four sections: North Fork, South Fork, Middle Estuary and Lower Estuary. The North Fork of the St. Lucie River traverses the City. The creation of St. Lucie Inlet in 1892 connected the Indian River Lagoon to the Atlantic Ocean at the mouth of the SLR. This project ultimately converted this freshwater tributary to a riverine estuary (freshwater in the upper reaches and saltwater in the middle and lower sections). This unique salinity gradient changed the natural resources found in the SLR. Because of its geographic location and tidal connection through the St. Lucie Inlet, the North Fork supports high species diversity

and serves as an important nursery ground for a variety of fish and wildlife.

Map CST-2 locates the habitats with the coastal planning area. The following table lists the habitats ~~the that~~ fall within the coastal planning area recognized by the Florida Fish and Wildlife Conservation Commission (FWC).

**Table 5-4  
Habitats in the Coastal Planning Area**

Habitat	Category	Acreage	Percentage
Bare Soil/Clearcut	Disturbed/Developed	50.01	0.89%
Exotic Plants	Disturbed/Developed	1.11	0.02%
High Impact Urban	Disturbed/Developed	4,271.92	76.06%
Low Impact Urban	Disturbed/Developed	1,293.46	23.03%
	<b>Category Total</b>	<b>5,616.50</b>	<b>48.73%</b>

Habitat	Category	Acreage	Percentage
Cypress/Pine/Cabbage Palm	Native Habitats	30.35	0.99%
Dry Prairie	Native Habitats	807.18	26.38%
Hardwood Hammocks and Forest	Native Habitats	385.92	12.61%
Pinelands	Native Habitats	1,736.09	56.74%
Sand Pine Scrub	Native Habitats	15.37	0.50%
Shrub and Brushland	Native Habitats	78.46	2.56%
Xeric Oak Scrub	Native Habitats	6.16	0.20%
	<b>Category Total</b>	<b>3,059.54</b>	<b>26.55%</b>

Habitat	Category	Acreage	Percentage
Cypress Swamp	Water & Wetlands	27.83	0.98%
Freshwater Marsh and Wet Prairie	Water & Wetlands	431.03	15.13%
Hardwood Swamp	Water & Wetlands	718.01	25.20%
Mangrove Swamp	Water & Wetlands	557.60	19.57%
Mixed Wetland Forest	Water & Wetlands	1.63	0.06%
Open Water	Water & Wetlands	926.77	32.53%
Salt Marsh	Water & Wetlands	14.84	0.52%
Shrub Swamp	Water & Wetlands	171.15	6.01%
	<b>Category Total</b>	<b>2,848.87</b>	<b>24.72%</b>
<b>Grand Total Coverage Acreage</b>		<b>11,524.91</b>	

The Overall land coverage within the City is broadly categorized into Agricultural, Disturbed/Developed, Native Habitats, and Water/Wetland. As mapped, there are no Agricultural lands within the coastal planning area. Native Habitats comprise 26.55% of the area and Water/Wetlands comprise 24.72% making over half of the coastal planning area natural environmental systems. Disturbed/Develop lands comprise the remaining 48.73% of the coastal

planning area. Appendix 5-B. Habitat Descriptions, provides the description, as provided by the FWC, of these habitats.

**Land Use in the Coastal Area**

The existing land uses within the City’s coastal planning area are shown on map CST-1. The following table lists the land uses within the coastal planning area. The primary development type in the Coastal Planning Area is residential making up 37.88% of the total land area. The second most predominant development type is planned unit development which is made up of primarily residential uses with some commercial, institutional and industrial uses. The North Fort of the St. Lucie River and Open Space make up 4.9% and 6.34% respectively.

**Table 5-5  
Existing Land Use in the Coastal Planning Area**

<del>Existing Land Use</del>	<del>-</del>	<del>Acreage</del>	<del>Percent</del>
<del>CG</del>	<del>Commercial General</del>	<del>118.04</del>	<del>1.02%</del>
<del>CN</del>	<del>Commercial Neighborhood</del>	<del>7.13</del>	<del>0.06%</del>
<del>CS</del>	<del>Commercial Service</del>	<del>33.36</del>	<del>0.29%</del>
<del>P</del>	<del>Professional</del>	<del>30.40</del>	<del>0.26%</del>
<del>GU</del>	<del>General Use</del>	<del>1,266.00</del>	<del>10.99%</del>
<del>†</del>	<del>Institutional</del>	<del>179.98</del>	<del>1.56%</del>
<del>Residential</del>	<del>Residential</del>	<del>4,365.33</del>	<del>37.88%</del>
<del>PUD</del>	<del>Planned Unit Development</del>	<del>4,216.56</del>	<del>36.59%</del>
<del>LMD</del>	<del>Limited Mixed Use</del>	<del>12.88</del>	<del>0.11%</del>
<del>NFSLR</del>	<del>North Fort St. Lucie River</del>	<del>564.39</del>	<del>4.90%</del>
<del>Open Space</del>	<del>Open Space</del>	<del>730.18</del>	<del>6.34%</del>
<del>TOTALS</del>	<del>-</del>	<del>11,524.24</del>	<del>100.00%</del>

<u>Existing Land Use</u>	<u>Description</u>	<u>Acres</u>	<u>Percent</u>
<u>CG</u>	<u>Commercial General</u>	<u>221.15-221.1450506</u>	<u>1.92%</u>
<u>CG/CH/ROI</u>	<u>Highway Commercial/ Commercial General/ Medium Density Residential Office Institutional</u>	<u>9.269-258923593</u>	<u>0.08%</u>
<u>CG/CS/ROI</u>	<u>Commercial General/ Highway Commercial/ Commercial General/ Medium Density Residential Office Institutional</u>	<u>3.383-380760153</u>	<u>0.03%</u>
<u>CG/ROI</u>	<u>Commercial General/ Medium Density Residential Office Institutional</u>	<u>25.0425-03952796</u>	<u>0.22%</u>
<u>CH</u>	<u>Highway Commercial</u>	<u>1.191-185816288</u>	<u>0.01%</u>
<u>CH/CG/ROI</u>	<u>Highway Commercial/ Commercial General/ Medium Density Residential Office Institutional</u>	<u>5.575-571921816</u>	<u>0.05%</u>
<u>CL</u>	<u>Limited Commercial</u>	<u>51.8651-86459307</u>	<u>0.45%</u>
<u>CS</u>	<u>Service Commercial</u>	<u>36.3736-36808681</u>	<u>0.32%</u>
<u>CS/ROI</u>	<u>Service Commercial/ Medium Density Residential Office Institutional</u>	<u>11.5811-57778301</u>	<u>0.10%</u>
<u>HWY</u>	<u>Highway</u>	<u>4.084-083013362</u>	<u>0.04%</u>
<u>I</u>	<u>Institutional</u>	<u>165.1165-1039674</u>	<u>1.43%</u>
<u>NFSLR</u>	<u>North Fort St. Lucie River</u>	<u>540.45540-4543932</u>	<u>4.69%</u>
<u>OSC</u>	<u>Open Space-Conservation</u>	<u>556.94556-9367657</u>	<u>4.83%</u>
<u>OSP</u>	<u>Open Space- Preservation</u>	<u>1,296.621296-615438</u>	<u>11.24%</u>
<u>OSR</u>	<u>Open Space- Recreation</u>	<u>1,1304.211304-213365</u>	<u>11.31%</u>
<u>RGC</u>	<u>Residential Golf Course</u>	<u>2,428.232428-231179</u>	<u>21.06%</u>
<u>RGC/CG</u>	<u>Residential Golf Course/Commercial General</u>	<u>65.5865-57892557</u>	<u>0.57%</u>
<u>RL</u>	<u>Low Density Residential</u>	<u>4,279.314279-313334</u>	<u>37.11%</u>

<u>Existing Land Use</u>	<u>Description</u>	<u>Acres</u>	<u>Percent</u>
<u>RM</u>	<u>Medium Density Residential</u>	<u>144.13144.1334965</u>	<u>1.25%</u>
<u>RM/CG/OSC</u>	<u>Medium Density Residential/ Commercial General/ Open Space-Conservation</u>	<u>16.8916.88632509</u>	<u>0.15%</u>
<u>ROI</u>	<u>Medium Density Residential Office Institutional</u>	<u>189.09189.0887317</u>	<u>1.64%</u>
<u>SLC OSP</u>	<u>Open Space- Preservation (St. Lucie County)</u>	<u>51.4251.41602568</u>	<u>0.45%</u>
<u>U</u>	<u>Utilities</u>	<u>124.63124.6298637</u>	<u>1.08%</u>
<u>Totals</u>		<u>11,532.0811532.07729</u>	<u>100.00%</u>

### **Water Access Facilities**

Public access to water is provided at River Place Park, Veteran's Park at Rivergate, and Tom Hooper Park. The Recreation and Open Space Element provides specific details on the all public, park and recreational facilities.

### **Historic Resources**

The Bureau of Archaeological Research within the Florida Office of Cultural and Historic Preservation maintains the Florida Master Site File (MSF); a database that contains information on archaeological and historic resources in Florida. The state MSF also contains those sites listed on the National Register. Map FLU-8 identifies and locates the historic resources identified in the MSF that are located in the City. A listing of these resources is contained in Appendix 5-F. The Spruce Bluff Indian Burial Mound is the only historic resource located within the coastal planning area of the City.

## Infrastructure in the Coastal Area

Three schools and one fire station lie within the Coastal Planning Area. Additionally, there are a number of bridges within the area as well.

The following is a list of roadways with bridges (plus identification of the related waterway.)

### Port St. Lucie Boulevard

- C-23 Canal (Bridge)
- E-84 (Bridge)
- C-24 Canal (Bridge)
- North Fork of the St. Lucie River (two Bridges)

### SW Oaklyn Street

- C-24 Canal (Bridge)

### S.E. Floresta Dr. (2)

- Elkcam Waterway (Bridge)

### Ballantrae Blvd

- Howard Creek (Bridge)

### S.E. Westmoreland Blvd. (Water Bodies from West to East)

- Howard Creek (Bridge)

## HURRICANE EVACUATION

The Florida Division of Emergency Management, the Department of Economic Opportunity Division of Community Planning, and the Department of Transportation, in coordination with the Regional Planning Councils throughout the State developed a Statewide Regional Evacuation Study Program. The [2016 Statewide Regional Evacuation Study \(St. Lucie County Appendix and Treasure Coast Evacuation Transportation Analysis 2010 Statewide Regional Evacuation Study for the Treasure Coast Region\)](#) is completed and available. This report updates the region's evacuation population estimates, evacuation clearance times and public shelter demand. The Treasure Coast study covers Indian River, Martin, Palm Beach and St. Lucie [Counties](#) and their municipalities and provides the most current evacuation data available. The complete study, Volumes 1 through 8, can be found on the Treasure Coast Regional Planning Council website. Provided below are pertinent points from this study. Please note this information is specific to St. Lucie County as a whole, the study does not provide breakout data for the City of Port St. Lucie alone.

The regional model developed for the Treasure Coast used a series of input data which included:

- Designated evacuation routes and the supporting roadway network;
- A regional zone system identifying Traffic Evacuation Zones based on demographic information;
- Demographic data for 2006, 2010 and 2015, including site-built homes, mobile homes (including RV's and Boats), and hotel/motel units;
- Incorporation of planned roadway improvements for 2010, and 2011 through 2015;
- Behavioral response assumptions;
- Availability and location of public shelters; and



- Evacuation Zones correlating to predicated surge data associated with storm categories based on the Saffir-Simpson hurricane wind scale.

Two distinct sets of analyses were conducted using the evacuation transportation model, one set of analysis is for growth management purposes and one set is for emergency management purposes. These sets are identified as the Base Scenario and as the Operational Scenario. The base scenario was developed to estimate a series of worst case scenarios and is identical for all eleven Regional Planning Councils (RPCs) across the State. This scenario assumes 100 percent of the vulnerable population evacuates and includes impacts from counties outside of the TCRPC area. This scenario is generally designed for growth management purposes, in order to ensure that all residents that choose to evacuate during an event are able to do so. The operational scenarios were developed by the Regional Planning Councils in coordination with their local county emergency managers and are designed to provide important information to emergency management personnel to plan for different storm events. These scenarios are different from region to region and vary for each evacuation level.

The following table identifies the demographic characteristics utilized for St. Lucie County for year 2010 for analysis.

**TABLE 5-6  
St. Lucie County Demographic Characteristics**

Occupied site-built homes	<u>125,955</u> <u>93,492</u>
Population in site-built homes	<u>333,204</u> <u>269,736</u>
Occupied mobile homes	<u>8,052</u> <u>40,115</u>
Population in mobile home	<u>14,354</u> <u>117,312</u>
Hotel/motel units	<u>5,357</u> <u>3,726</u>

Source: 2016 Supplemental Summary – Statewide Regional Evacuation Study (St Lucie County Appendix) 2010 Statewide Regional Evacuation Study

Source: 2010 Statewide Regional Evacuation Study

The vulnerable population, or population-at-risk, is defined as the portion of the population living within the county designated evacuation zones. This population is living in areas that are at risk for severe flooding during a storm event. The study’s evacuation zones correlate to predicted storm surge associated with the hurricane storm categories of the Saffir-Simpson wind scale. The Saffir-Simpson scale identifies a category one hurricane as having sustained winds of 74-95 mph, a category two hurricane having sustained winds of 96-110 mph, a category three hurricane having sustained winds of 111-130 mph, a category four hurricane having sustained winds of 131-155 mph, and a category five hurricane having sustained winds greater than 155 mph. Evacuation Zones A – E correlate to Category 1 – 5 storms respectively. The following table identifies the following for St. Lucie County based on the 2010-2020 demographic data. It is important to note that vulnerable population numbers are not inclusive, meaning population numbers listed for a higher zone are not included in the lower zone. For example, vulnerable population listed for Evacuation Zone B does not include vulnerable population listed for Evacuation Zone A.



TABLE 5-7

St. Lucie County Vulnerable Population per Evacuation Zone

<u>2020</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
<u>Site-built Homes</u>	<u>20,831</u>			<u>11,103</u>	
<u>Mobile/Manuf. Homes</u>	<u>1,245</u>			<u>222</u>	
<b><u>TOTAL</u></b>	<b><u>22,076</u></b>			<b><u>11,325</u></b>	
<u>2010</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
<u>Site-built Homes-</u>	<u>6,942</u>	<u>2,241</u>	<u>2,710</u>	<u>1,447</u>	<u>1,775</u>
<u>Mobile/Manuf. Homes-</u>	<u>1,759</u>	<u>307</u>	<u>286</u>	<u>75</u>	<u>104</u>
<b><u>TOTAL</u></b>	<b><u>8,701</u></b>	<b><u>2,548</u></b>	<b><u>2,996</u></b>	<b><u>1,522</u></b>	<b><u>1,879</u></b>

Source: 2016 Statewide Regional Evacuation Study  
~~Source: 2010 Statewide Regional Evacuation Study~~

Evacuees are expected to seek shelter through a variety of means. Some will leave the County or return to other residences outside the area; others will stay with relatives and friends or, will check into hotels in less vulnerable areas; and, some will have to rely on public shelter. The following table identifies the projected destination the vulnerable population will evacuate to. Again, it is important to note that vulnerable population numbers are not inclusive, meaning population numbers listed for a higher zone are not included in the lower zone. For example, vulnerable population listed for Evacuation Zone B does not include vulnerable population listed for Evacuation Zone A.

**TABLE 5-8**  
**Vulnerable Population by Destination for 2020**

<u>2020</u>	<u>Level A</u>	<u>Level B</u>	<u>Level C</u>	<u>Level D</u>	<u>Level E</u>
<u>To Friends and Family</u>	<u>14,632</u>			<u>7,295</u>	
<u>To Hotel/ Motel</u>	<u>3,860</u>			<u>1,860</u>	
<u>To Public Shelter</u>	<u>2,192</u>			<u>1,452</u>	
<u>To Other Destination</u>	<u>3,806</u>			<u>1,570</u>	

Source: 2016 Statewide Regional Evacuation Study

**TABLE 5-8**  
**Vulnerable Population by Destination for 2010**

<u>-</u>	<u>Level A</u>	<u>Level B</u>	<u>Level C</u>	<u>Level D</u>	<u>Level E</u>
<u>To Friends and Family-</u>	<u>5,133</u>	<u>1,513</u>	<u>1,783</u>	<u>910</u>	<u>1,122</u>
<u>To Hotel/ Motel-</u>	<u>1,569</u>	<u>428</u>	<u>492</u>	<u>240</u>	<u>297</u>
<u>To Public Shelter-</u>	<u>696</u>	<u>204</u>	<u>348</u>	<u>180</u>	<u>221</u>
<u>To Other Destination-</u>	<u>1,303</u>	<u>402</u>	<u>372</u>	<u>193</u>	<u>238</u>

~~Source: 2010 Statewide Regional Evacuation Study~~

Map CST-3 identifies the major evacuation routes, the public hurricane shelters and the distribution points in the City of Port St. Lucie. The following table lists the shelters in the County, their address and capacity.

**TABLE 5-9  
Shelters within the County**

<b>Shelter</b>	<b>Location</b>	<b>City</b>	<b>Capacity</b>
BAYSHORE ELEMENTARY	1661 SW BAYSHORE BLVD	PORT ST. LUCIE	499
OAK HAMMOCK K-8 SCHOOL	1251 SW CALIFORNIA BLVD	PORT ST. LUCIE	4097
MANATEE ACADEMY K-8	1450 SW HEATHERWOOD	PORT ST. LUCIE	400
MORNINGSIDE ELEMENTARY	2300 SE GOWIN DRIVE	PORT ST. LUCIE	543
TREASURE COAST HIGH	1000 SW DARWIN BLVD	PORT ST LUCIE	500
WEST GATE K-8	1050 NW CASHMERE BLVD	PORT ST LUCIE	500
VILLAGE GREEN ELEMENTARY	1700 LENNARD ROAD	PORT ST. LUCIE	348
MARIPOSA ELEMENTARY	2620 SE MARIPOSE AVENUE	PORT ST. LUCIE	377
SAVANNA RIDGE ELEMENTARY	6801 LENNARD RD	PORT ST. LUCIE	677
WEATHERBEE ELEMENTARY	800 E. WEATHERBEE RD	PORT ST. LUCIE	975
WINDMILL POINT ELEMENTARY	700 DARWIN BOULEVARD	PORT ST. LUCIE	377
<u>PORT ST. LUCIE COMMUNITY CENTER (Back up Special Needs)</u>	<u>2195 SE AIROSO BOULEVARD</u>	<u>PORT ST. LUCIE</u>	<u>(250)</u>
<b>Total Capacity in Port St. Lucie</b>			<b>9293</b>
C.A. MOORE ELEMENTARY SCHOOL	827 N 29TH STREET	FT. PIERCE	677
FLORESTA ELEMENTARY	3201 S. 25TH STREET	FT. PIERCE	770
FT. PIERCE CENTRAL HIGH	4101 S. 25TH STREET	FT. PIERCE	500
LAKWOOD PARK ELEMENTARY	7800 INDRIO ROAD	FT. PIERCE	605
PARKWAY ELEMENTARY	7000 NW SELVITZ ROAD	FT. PIERCE	417
WESTWOOD HIGH SCHOOL	1801 PANTHER LANE	FT. PIERCE	1733
SAMUEL S. GAINES ACADAMY K-8	2250 S. JENKINS ROAD	FT. PIERCE	500
*H.L. FENN COMMUNITY CENTER	2000 VIRGINIA AVENUE	FT. PIERCE	500
<b>Total Capacity Fort Pierce</b>			<b>5702</b>
* <i>Special Needs Shelter</i>	<b>TOTAL CAPACITY COUNTYWIDE</b>		<b>14,995</b>

Source: 2016 Statewide Regional Evacuation Study (Volume 5-10)

Source: 2010 Statewide Regional Evacuation Study

Overall there are ~~nineteen~~ twenty temporary emergency shelters in the County; ~~eleven~~ twelve of these are located in Port St. Lucie. Shelter capacity countywide is 14,995. Shelter capacity for the facilities located within Port St. Lucie is 9,293. St. Lucie County Emergency Management determines which facilities will be open in any given year. At this time there is only one special needs shelter in the County, it is the H.L Fenn Community Center located in Fort Pierce. This facility, the only non-school facility, has a capacity of 500.

A special needs shelter is a temporary emergency facility capable of providing care to residents whose medical condition exceeds the capabilities of the Red Cross Shelter but is not severe enough to require hospitalization. Health Department medical staff supports these shelters. The State of Florida Division of Emergency Management, Department of Health, local emergency management agencies, and health care agencies have worked together over the last decade to establish Special Needs Shelter standards, protocols and technical assistance that can be integrated into the Florida Emergency Management System. Although not referenced in the

Statewide Regional Evacuation Study, the City has identified the Port St. Lucie Community Center as a backup special needs shelter with a capacity of 250.

### Clearance Times

Calculated clearance times are used by emergency managers as one input to determine when to recommend an evacuation order. This calculation can include the population-at-risk, shadow evacuees, as well as evacuees from other counties anticipated to pass through the county. Clearance time is developed to include the time required for evacuees to secure their homes and prepare to leave, the time spent by all vehicles traveling along the evacuation route network, and the additional time spent on the road caused by traffic and road congestion. Clearance time does not relate to the time any one vehicle spends traveling along the evacuation route network, nor does it guarantee vehicles will safely reach their destination once outside the County. Clearance times for St. Lucie County are presented in the tables below.

**TABLE 5-10**  
**2020 Base Scenario Clearance Time in Hours per Evacuation Level**

	Level A	Level B	Level C	Level D	Level E
<b>Clearance Time to Shelter</b>	<u>12.542</u> <del>.5</del>	<u>13.042</u> <del>.5</del>	<u>13.543</u>	<u>15.046</u>	<u>17.548</u>
<b>In-County Clearance Time</b>	<u>13.543</u>	<u>14.543</u> <del>.5</del>	<u>19.544</u>	<u>25.047</u> <del>.5</del>	<u>32.525</u>
<b>Out of County Clearance Time</b>	<u>14.544</u>	<u>15.044</u> <del>.5</del>	<u>19.544</u> <del>.5</del>	<u>25.048</u> <del>.5</del>	<u>33.025</u>
<b>Regional Clearance Time</b>	<u>15.044</u> <del>.5</del>	<u>16.544</u> <del>.5</del>	<u>19.546</u>	<u>26.049</u> <del>.5</del>	<u>37.028</u>

Source: 2010 Statewide Regional Evacuation Study

**TABLE 5-11**  
**2020 Operational Scenario Clearance Time in Hours per Evacuation Level**

	Level A	Level B	Level C	Level D	Level E
<b>Clearance Time to Shelter</b>	<u>6.56</u> <del>.5</del>	<u>7.56</u> <del>.5</del>	<u>9.56</u> <del>.5</del>	<u>12.542</u>	<u>18.542</u>
<b>In-County Clearance Time</b>	<u>9.07</u>	<u>10.58</u>	<u>13.040</u> <del>.5</del>	<u>20.545</u> <del>.5</del>	<u>26.025</u>
<b>Out of County Clearance Time</b>	<u>9.58</u> <del>.5</del>	<u>11.08</u> <del>.5</del>	<u>14.541</u> <del>.5</del>	<u>21.047</u>	<u>30.025</u>
<b>Regional Clearance Time</b>	<u>10.59</u>	<u>12.59</u> <del>.5</del>	<u>17.043</u> <del>.5</del>	<u>23.520</u>	<u>35.032</u>

Source: 2016 Statewide Regional Evacuation Study  
~~Source: 2010 Statewide Regional Evacuation Study~~

*Clearance Time to Shelter* is defined as the time necessary to safely evacuate vulnerable residents and visitors to a “point of safety” within the County based on a specific hazard, behavioral assumptions and evacuation scenario. This is calculated from the point in time when the evacuation order is given to the point in time when the last vehicle reaches a point of safety within the county. *In-County Clearance Time* is the time required from the point an evacuation order is given until the last evacuee can either leave the evacuation zone or arrive at safe shelter within the county. This does not include those evacuees leaving the county on their own. *Out of County Clearance Time* is calculated from the point an evacuation order is given to the point in time when the last vehicle assigned an external destination exits the county, and *Regional Clearance Time* is the time necessary to safely evacuate vulnerable residents and visitors to a “point of safety” based on a specific hazard, behavioral assumptions and evacuation scenario, calculated from last vehicle assigned an external destination exits the region.

The primary means, available to the City, to reduce evacuation times would be the



implementation of physical improvements to those portions of its local roadways designated as evacuation routes. The Treasure Coast Regional study identified the following planned improvements scheduled to occur between 2011 and 2015.

**TABLE 5-12  
Roadway Improvements 2011 - 2015**

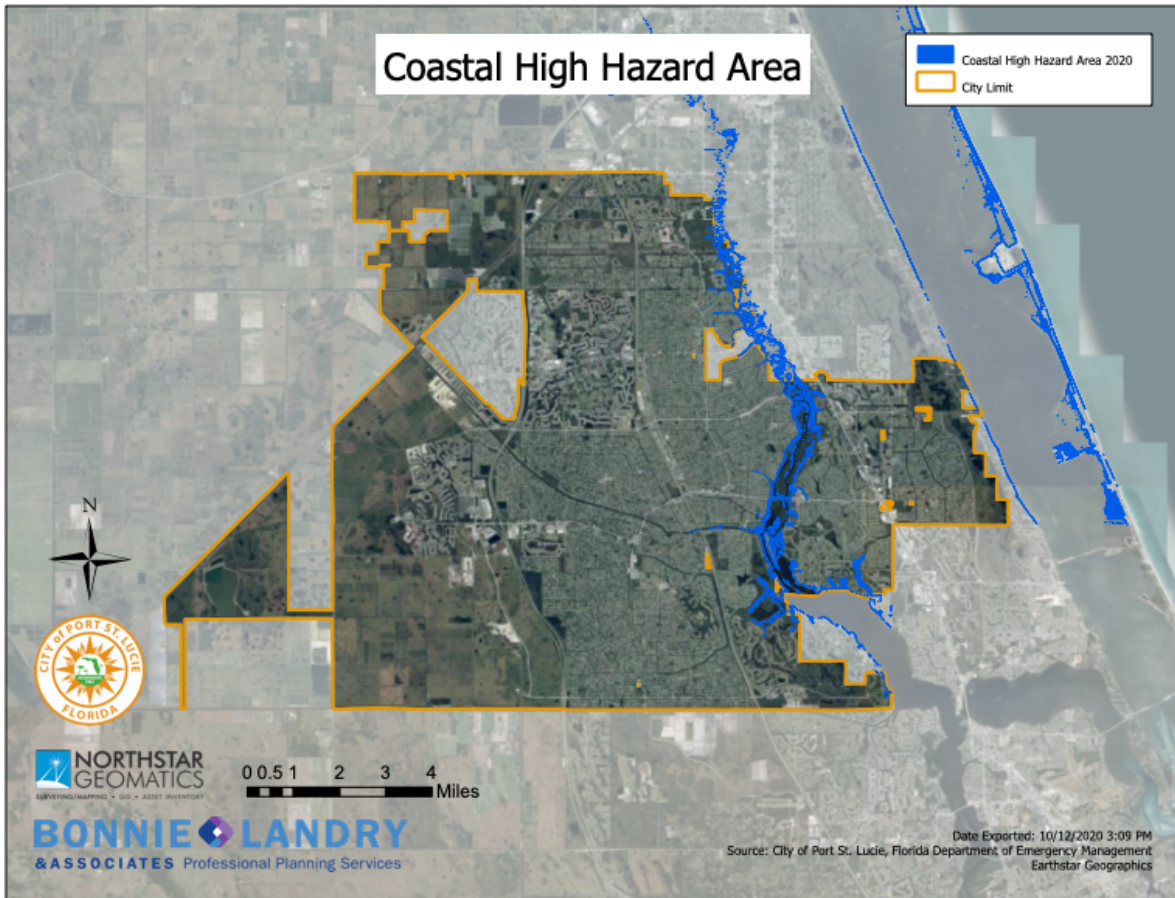
<b>Road</b>	<b>From</b>	<b>To</b>	<b># Lanes</b>
SR 70	Okeechobee County line	MP 10.216	4
SR 70	Kings Hwy	Jenkins Rd	6
I-95	SR 70	Indian River County line	8

Source: 2010 Statewide Regional Evacuation Study

The Capital Improvements Element of this plan identifies major proposed roadway improvements within the City. The City has identified improvements to Becker Road and the extension of the Crosstown Parkway to U.S. 1 as projects to improve evacuation times. Other means the City could pursue to reduce evacuation times include the development of additional roadways and bridges over the North Fork of the St. Lucie River to provide an additional east-west thoroughfare and reduce evacuating traffic on existing east-west thoroughfares.

### **Coastal High Hazard Areas**

The area projected to experience the most hurricane damage is the coastal high hazard area (CHHA). The coastal high-hazard area is the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model. Map CST-4 shows the CHHA in the City. The majority of the Coastal High Hazard Area in the City is undeveloped wetland habitat in the floodplain of the North Fork of the St. Lucie River. The following table, identifying the habitats within the CHHA, shows that less than 5 acres of the 156 acres that comprises the CHHA is urban in nature.



Source: City of Port St. Lucie and Florida Department of Emergency Management

**TABLE 5-13  
Habitats in the CHHA**

<b>CLASS</b>	<b>Acreage</b>
Bare Soil/Clearcut	0.04
Cypress Swamp	0.15
Cypress/Pine/Cabbage Palm	0.07
Dry Prairie	0.53
Freshwater Marsh and Wet Prairie	2.90
Hardwood Hammocks and Forest	1.10
Hardwood Swamp	38.89
High Impact Urban	4.25
Low Impact Urban	0.67
Mangrove Swamp	42.28

**TABLE 5-13  
Habitats in the CHHA**

<b>CLASS</b>	<b>Acreage</b>
Mixed Wetland Forest	0.01
Open Water	52.99
Pinelands	3.17
Salt Marsh	0.34
Shrub and Brushland	0.25
Shrub Swamp	8.89
<b>Total Acreage</b>	<b>156.51</b>

Source: Florida Fish and Wildlife Conservation Service.

The significant infrastructure that falls in the CHHA is that segment of Port St. Lucie Boulevard, (State Highway 716) that traverses the North Fork of the St. Lucie River. Map CST-5 CHHA Facilities identifies a number of bridges in the Coastal High Hazard Area.

**NATURAL DISASTER PLANNING**

The City has developed and has in place a Comprehensive Emergency Management Plan and has in place a statewide mutual aid agreement. The City also participates in the Unified Local Mitigation Strategy Program and the National Flood Insurance Program. As identified in the St. Lucie County Local Mitigation Strategy Program (LMS), the following natural hazards pose a risk to the County and the City: floods, hurricanes/tropical storms, tornadoes, severe thunderstorms/lightning, drought, temperature extremes, muck fires, wildfire/urban interface fires and erosion. Hurricanes/tropical storms and floods are given the highest priority.

Hurricanes have the highest potential to occur from June through November; heavy rainfall, high winds, storm surge and widespread flooding may accompany these storms, as well as a potential for associated tornadoes. During a hurricane evacuation, a significant number of vehicles will have to be moved across the local and regional road network. The quantity of evacuating vehicles will vary depending upon the magnitude of the hurricane, publicity and warnings provided about the storm and particular behavioral response characteristics of the vulnerable population. The City must be prepared to evacuate highly vulnerable populations on critical routes, often concurrently with evacuees from inside and outside the County.

Hurricanes are rated on the Saffir-Simpson Hurricane Wind Scale based upon five intensities:

Category 1 hurricanes have sustained winds of 74 to 95 mph. These very dangerous winds will produce some damage.

Category 2 hurricanes have sustained winds of 96 to 110 mph. These extremely dangerous winds will cause extensive damage.

Category 3 hurricanes have sustained winds of 111 to 130 mph. Devastating damage will occur.

Category 4 hurricanes have sustained winds of 131 to 155 mph. Catastrophic damage will occur.

Category 5 hurricanes have sustained winds greater than 155 mph. Catastrophic damage will occur.

Source: NOAA

The St. Lucie County Division of Emergency Management provides a coordinating point for management of local emergencies to catastrophic events in and around St. Lucie County. It is the lead organization in coordinating disaster response from a municipal level to state and federal. Recovery planning and financial assistance from the State of Florida and FEMA are established through the Division's emergency operations center. The County disseminates information concerning the need for residents to evacuate at various hurricane threat levels and strives to educate the general citizenry regarding emergency preparedness plans and evacuation shelter assignments.

Public health and safety will receive the first priority in post-disaster emergency permitting decisions. Post-disaster redevelopment should ensure that actions include the following:

1. Repairs to potable water, wastewater and power facilities;
2. Removal of debris from roadways and required infrastructure;
3. Stabilization or removal of any structure which is about to collapse;
4. Minimal repairs to make structures habitable; and
5. Emergency repairs related to environmental damage.

Additionally, post-disaster redevelopment strategic planning should provide a basis to:

1. Ensure a means to restore economic activity;
2. Establish a framework for deciding whether to implement a temporary moratorium on building activity as may be required for public safety;
3. Develop procedures for reviewing and deciding upon emergency building permits;
4. Coordinate with State and Federal officials to prepare disaster assistance applications;
5. Analyze and recommend to the City Council hazard mitigation options, including reconstruction or relocation of damaged public facilities;
6. Recommend amendments to the Local Comprehensive Emergency Management Plan and other appropriate policies and procedures; and
7. Ensuring timely re-entry by residents following an evacuation.

Included in post-disaster redevelopment planning should be the basis for evaluating future options for damaged public facilities following a hurricane or other disaster event; which includes but is not limited to abandonment, repair in place, relocation and reconstruction with structural modifications. The following considerations will impact final determination:

1. Construction and maintenance costs;
2. History of potential for recurring damages;
3. Impacts on land use, the environment, and the public sector;
4. Inclusion in the inventory of the National Register of Historic;
5. Consistency with federal funding provisions; and
6. Consideration of structural integrity and safety.

### **St. Lucie Nuclear Power Plant**

The Florida Power and Light (FPL) St. Lucie Nuclear Power Plant is located on south Hutchinson Island only a few miles from the City's eastern boundary. The population within the 10 mile

emergency planning zone (EPZ) to the nuclear power plant is considered at greatest risk of exposure to radiation and radioactive materials in the unlikely event of an emergency. State and local officials, together with FPL, have prepared a detailed emergency plan for people within the 10 mile EPZ of the plant.

Nuclear energy production is monitored closely by the Nuclear Regulatory Commission (NRC), a federal agency. Daily inspections are conducted at the St. Lucie Plant to guarantee compliance. Several identical safety systems are in place so that if one fails, others automatically go to work. The purpose of radiological emergency preparedness is to protect people from the effects of radiation exposure after an accident at a nuclear power plant. Evacuation is the most effective protective measure because it protects the whole body (including the thyroid gland and other organs) from all radionuclides and all exposure pathways. However, in situations when evacuation is not feasible, in-place sheltering is substituted as a protective action. In addition, administering potassium iodide is a reasonable, prudent, and inexpensive supplement to both evacuation and sheltering. When the population is evacuated out of the area, and potentially contaminated foodstuffs are interdicted, the risk from further radioactive iodine exposure to the thyroid gland is essentially eliminated.

In the unlikely event of radiation contamination, the environmental impacts could range from modest to catastrophic on a wide ranging, long term scale dependent on the type and scope of event triggering a release of contamination. Long term commitments at the federal level will be required in the event of a significant emergency. At the local level, the City and County should continue to endorse the beach nourishment efforts to repair and stabilize the segment of critically eroded beach that is recognized as a threat to the power plant and should consider all current technological advances to address radiation exposure when periodically updating their CEMP.

#### Addressing the Perils of Flood

The 2015 Florida Legislature directed jurisdictions that have a Coastal Management Element as a part of their comprehensive plan to include a redevelopment component with principles that must be used to eliminate inappropriate and unsafe development in the coastal areas - when opportunities arise. The 2020 update to the City of Port St. Lucie Comprehensive Plan includes strategies that prepare the city for the current and future risks of high-tide events, storm surge, flash floods, stormwater runoff and the related impacts of sea-level rise.

The flood protection strategies will include:

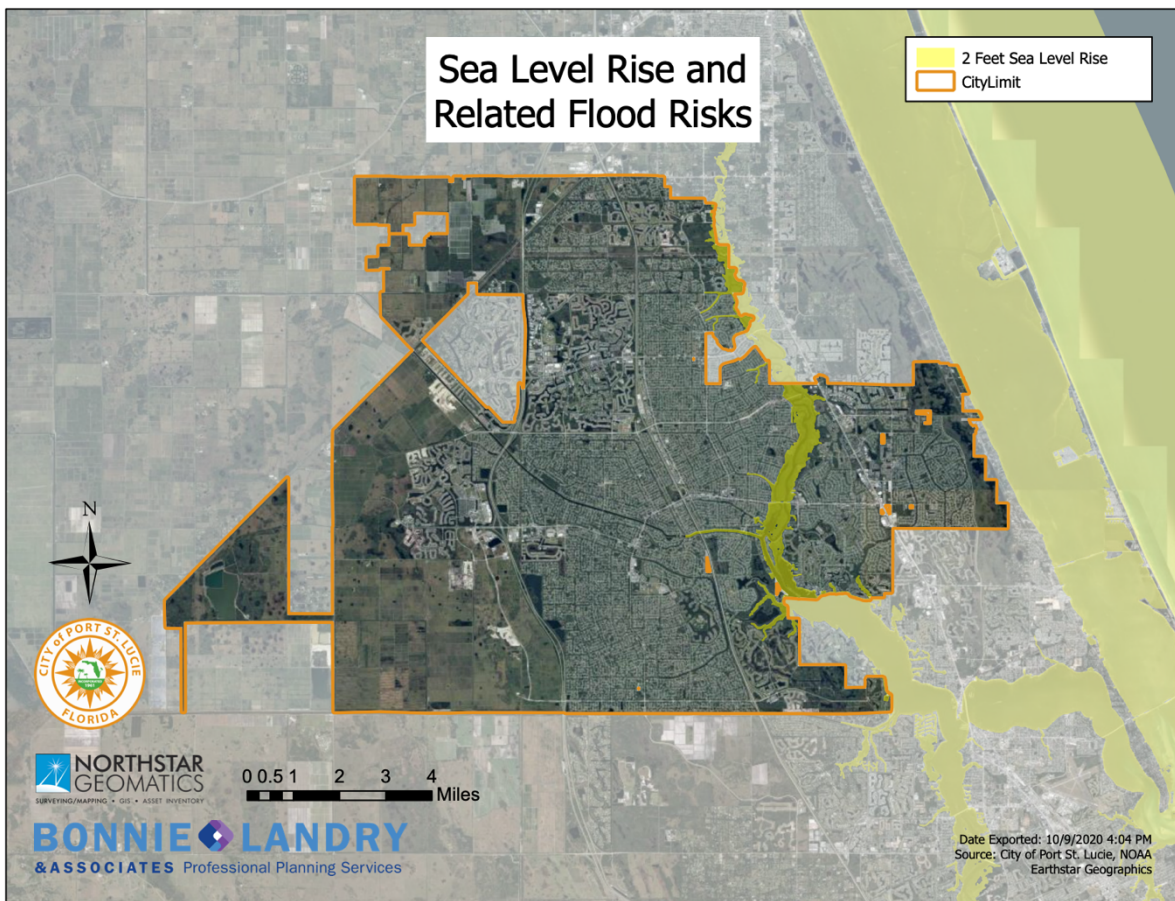
1. **Procedural** - Outreach and education, real estate disclosure.
2. **Protection** - "Hard" and "soft" structurally defensive measures.
3. **Accommodation** - Altering the design and use of structures to handle flooding.
4. **Strategic Relocation** - Incremental relocation development to safer areas.
5. **Avoidance** - Directing new development away from vulnerable areas.



Adaptation Strategies

- 1) Land-use regulations & building codes.
- 2) Limits on insurance subsidies.
- 3) Redesign and retrofitting of structures.
- 4) Updates for drainage, flood control, and water supply infrastructure.
- 5) Increased coastal protection.

In recognition of the risks of sea level rise and flood risk, the City utilized a tool provided by the National Oceanic and Atmospheric Administration (NOAA) to better understand the City's risk. The tool facilitates scenario illustration of sea level rise in one-foot increments. For the City's illustration, staff used a 2 foot rise in the sea level which is considered as a middle risk according to Florida State University Building Resilience Against Climate Effects (BRACE).



Source: City of Port St. Lucie and NOAA

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## GOALS, OBJECTIVES, AND POLICIES

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### **GOAL 5.1: MAINTAIN AND ENHANCE THE SOCIAL AND ECONOMIC RESOURCES OF THE PORT ST. LUCIE COASTAL PLANNING AREA THROUGH THE REGULATION OF DEVELOPMENT ACTIVITIES THAT WOULD DAMAGE OR DESTROY SUCH RESOURCES, OR THREATEN HUMAN LIFE AND CAUSE UNNECESSARY PUBLIC EXPENDITURES IN AREAS SUBJECT TO DESTRUCTION BY NATURAL DISASTERS.**

Continue to protect the natural resources of the coastal area through the implementation and strengthening of existing environmentally related laws, the assignment of appropriate Future Land Use designations, and providing for mitigation of development impacts.

*Objective 5.1.1: Continue to protect the natural resources of the coastal area through the implementation and strengthening of existing environmentally related laws, the assignment of appropriate Future Land Use designations and providing for mitigation of development impacts.*

Policy 5.1.1.1: Future development in the coastal area should be limited to those land uses which are resource dependent or compatible with the physical and environmental characteristics of the coastal area, or to those uses which can occur without degradation of important environmental values or interfere with legal public access to coastal area shorelines.

Policy 5.1.1.2: In developing land use policies for shoreline uses, first priority should be directed toward:

- a. Non-structural shoreline protection uses such as native shoreline re-vegetation programs;
- b. Approved water-dependent shoreline uses such as: fish and wildlife production, recreation, pervious accessways, small dock facilities and residential multi-slip dock facilities without commercial fuel tanks or other commercial services;
- c. Lowest priority should be directed to non-water dependent uses.

Policy 5.1.1.3: The City may continue to monitor all credible climate change data and what direct and potential effects this may have on the coastal planning area and natural resources. Based on this data the City may evaluate and update the resource protection standards of the Land Development Code and this plan as necessary.

*Objective 5.1.2: Continue to protect estuarine beaches and shoreline vegetation through the establishment and enforcement of existing land development regulations and construction standards that minimize the impacts of man-made structures on beach or shoreline vegetation, or coastal wetlands, and restore altered beaches or vegetation.*

Policy 5.1.2.1: Continue to enforce regulations which prohibit the alteration of estuarine beaches located within the City, and require restoration of degraded beaches as part of the site plan approval process for all new development and redevelopment.

*Objective 5.1.3: The City ~~may~~ shall direct population concentrations away from known or predicted coastal high hazard areas and limit public expenditures that subsidize development permitted in high-hazard areas except for restoration or enhancement of natural resources.*

Policy 5.1.3.1: The coastal high hazard area shall be defined pursuant to Chapter 163.3178(2)(h)F.S as the area below the elevation of the category 1 storm surge line as established by a Sea, Lakes, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model.



Policy 5.1.3.2: Within six months of the conclusion of each annual hurricane season, the City shall review the status of lands within its corporate limits and determine whether any areas of the City meet the criteria of a coastal high hazard area.

Policy 5.1.3.3: The City ~~may~~shall through land use designation and development review, regulate and limit the type of uses in the designated coastal high hazard area. Protection of human life and protection of natural resource system should be maximized. The City may direct population concentrations away from known or predicted High Hazard Areas.

Policy 5.1.3.4: The City ~~may~~shall consider relocation, mitigation, or replacement of infrastructure in the coastal high hazard area as appropriate and when funding becomes available.

Policy 5.1.3.5: ~~The City will partner with the U.S. Army Corps of Engineers to conduct a Coastal Storm Risk Management Study by 2025 to better understand the potential impacts of sea level rise.~~

*Objective 5.1.4: Coordinate with the County and neighboring communities to maintain or reduce hurricane clearance times identified for St. Lucie County in the 2010 Statewide Regional Evacuation Study for the Treasure Coast Region.*

Policy 5.1.4.1: Maintain, throughout the planning period, the high level, operational scenario estimated clearance time to shelter of 12 hours, and in-County clearance time of 25 hours as indentified in the 2010 Statewide Regional Evacuation Study for the Treasure Coast Region for St. Lucie County.

Policy 5.1.4.2: Continue to implement City road improvements identified in the St. Lucie County Local Mitigation Strategy Project Prioritization List to facilitate hurricane evacuation.

Policy 5.1.4.3: The City shall provide all hurricane evacuation studies and plans to the TCRPC, adjacent counties, and all other municipalities within St. Lucie County for consistency with regional and local plans before their adoption and implementation.

*Objective 5.1.5: Prepare post-disaster redevelopment plans that will reduce or eliminate the exposure of human life, public property, and private property to natural hazards.*

Policy 5.1.5.1: The City may maintain and update as needed, their Comprehensive Emergency Management Plan.

Policy 5.1.5.2: After a hurricane, but before re-entry of the population into evacuated areas, the City Council should meet to hear preliminary damage assessments, appoint a Recovery Task Force and consider a temporary moratorium on building activities not necessary for the public health, safety, and general welfare.

Policy 5.1.5.3: The City's Emergency Management Team shall coordinate disaster preparation and recovery measures.

Policy 5.1.5.4: The Recovery Task Force may review and decide upon emergency building permits; coordinate with state and federal officials to prepare disaster assistance applications; analyze and recommend to the City Council hazard mitigation options including reconstruction or relocation of damaged public facilities; develop a redevelopment plan; and, recommend amendments to the comprehensive plan, Local Comprehensive Emergency Management Plan, and other appropriate policies and procedures.

Policy 5.1.5.5: Immediate repair and cleanup actions needed to protect the public health and safety include repairs to potable water, wastewater, and power facilities; removal of debris; stabilization or removal of structures about to collapse; and minimal repairs to make dwellings habitable. These actions shall receive first priority in permitting decisions. Long-term redevelopment activities shall be postponed until the Recovery Task Force has completed its tasks.

Policy 5.1.5.6: If rebuilt, structures that suffer damage more than fifty percent of their appraised value shall be rebuilt to meet all current requirements including those enacted since construction of the structure.

Policy 5.1.5.7: The Recovery Task Force shall review all interagency hazard mitigation reports and make recommendations for amendments to the comprehensive plan accordingly.

Policy 5.1.5.8: The City may provide the basis for evaluating future options for damaged facilities following a hurricane or other disasters. Post disaster redevelopment plan options may include but are not limited to, abandonment, repair in place, relocation, and reconstruction with structural modifications. Future options should at a minimum consider the following:

1. History of and potential for future recurring damages;
2. Impacts on land use, the environment, and the public sector;
3. Consistency with federal, state and other applicable provisions; and
4. Consideration of structural integrity and safety.

Policy 5.1.5.9: The City ~~may~~shall consider hazard mitigation initiatives when determining capital improvement expenditures.

Policy 5.1.5.10: The City ~~may~~shall mitigate hazards through the regulation of building practices, floodplains, stormwater management and sanitary sewer facilities.

Policy 5.1.5.11: The City ~~may~~shall continue to identify areas in need of redevelopment including unsafe conditions to reduce exposure to risk to public and private property and human life.

*Objective 5.1.6: The City may continue to provide adequate access to shorelines, including parking facilities for shoreline access.*

Policy 5.1.6.1: New development shall maintain existing public access to the lagoon or NFSLR. New shoreline development and redevelopment shall show on their site plans existing access ways and the proposed development shall continue that access way, relocate it on the site, or donate it to the City according to the 1985 Coastal Zone Protection Act.

Policy 5.1.6.2: The City, with the County, should prioritize new park purchases and park development, with emphasis on parks that would provide public access to coastal area waters and include parking facilities and access to a state or county road where possible.

Policy 5.1.6.3: The City may increase access of current 2011 levels where possible and prevent the loss of the amount of public access to lagoon or river shorelines and coastal resources consistent with estimated public needs.

*Objective 5.1.7: Provide for the protection, preservation and sensitive reuse of public and private historic resources to ensure that the City does not experience a loss of historic resources.*

Policy 5.1.7.1: Review and revise, as needed, existing regulations that provide for identification of historic resources, encourage historic preservation, provide for sensitive reuse, permit excavation by the Division of Historic resources as an alternative prior to development, and

prevent vegetation removal to prevent a loss of historic resources within the City

Policy 5.1.7.2: The City may consider accepting donations of historic or archaeological sites.

Policy 5.1.7.3: The City may, on an annual basis, determine and map any structures or sites that meet the criteria for historic resources as defined within the City's Land Development Regulations and provide a list to appropriate agencies.

*Objective 5.1.8: The level of service standards and phasing of infrastructure adopted for the entire City in the Capital Improvements Element and other elements of this Comprehensive Plan shall apply to the coastal planning area.*

Policy 5.1.8.1: The level of service standards shall be applied whenever development orders or permits are requested for development in coastal planning areas.

**GOAL 5.2: THE CITY OF PORT ST. LUCIE SHALL CONSERVE, PROTECT, AND MANAGE THE NATURAL RESOURCES OF THE CITY IN A MANNER WHICH MAXIMIZES THEIR FUNCTIONS AND PURPOSES.**

*Objective 5.2.1: Air quality within Port St. Lucie should meet or surpass National Ambient Air Quality Standards (NAAQS) for all pollutants measured by the Florida Department of Environmental Protection (FDEP).*

Policy 5.2.1.1: The City should obtain the DEP annual Air Quality Report and confer with the FDEP on the source(s) of air quality violations and the proper abatement methods. If needed, coordinate with the FDEP in their efforts to enforce clean air standards.

Policy 5.2.1.2: The City may develop, where possible, bicycle and pedestrian paths to reduce vehicle use and the associated toxic pollutants.

Policy 5.2.1.3: The City may review implementable measures that would effectively reduce greenhouse gas emissions, and as financially feasible, enact effective measures to reduce emissions generated by City government operations and by policies effecting community-wide functions.

Policy 5.2.1.4: The City may facilitate development that maximizes energy efficiency and sustainability. This may include implementing Land Development Code standards promoting land use patterns and development techniques that reduce the total fossil fuel energy required to build and maintain uses, including standards that promote mixed land use patterns, urban infill, public transit and provisions for non-motorized interconnections between uses to reduce auto dependence and vehicle miles traveled.

Policy 5.2.1.5: The City may provide public information on the reduction of heat island effects in urban areas and reduction of air conditioning needs in structures through appropriate placement of canopy shading.

Policy 5.2.1.6: The City may preserve and enhance the City's physical and aesthetic character and environment by:

1. Preventing untimely and indiscriminate removal or destruction of trees.
2. Providing recognition to single-family residential homeowners for tree retention.
3. Providing protection for large trees.
4. Restricting the removal of trees on undeveloped land prior to review of a specific development proposal.

Policy 5.2.1.7: The City may implement the recommendations contained in the City of Port St. Lucie Tree Planting Plan for the U.S. Conference of Mayors Climate Protection Agreement to achieve a sustainable urban forest that contains a mix of tree species and ages in order to use the forest's ability to reduce storm water runoff and pollution, absorb air pollutants, provide wildlife habitat, absorb carbon dioxide, provide shade, stabilize soil, and increase property values.

*Objective 5.2.2: Conserve, appropriately use, and protect the quality and quantity of current and projected water sources and waters that flow into estuarine waters or oceanic waters to provide for the maintenance or improvement of water quality.*

Policy 5.2.2.1: Ensure that surface water management systems be designed and operated consistent with and the City's adopted Level of Service Standard.

Policy 5.2.2.2: The City may provide for open space as a part of the requirements for all development and redevelopment to promote shallow water aquifer recharge and stormwater filtration.

Policy 5.2.2.3: Work towards further education of the public regarding various methods of water conservation at the household and small business level.

Policy 5.2.2.4: Based on new technologies that become available, examine and revise, if needed, land development regulations that require water conserving landscape design, with minimum native vegetation requirements.

Policy 5.2.2.5: The City shall continue to enforce the adopted "Wellfield Protection Ordinance," and restrict activities that adversely affect water quality and quantity.

Policy 5.2.2.6: Continue to implement Utility Service Areas (USAs) for water and sewer program development to protect the City's water resources.

Policy 5.2.2.7: The City may coordinate with the South Florida Water Management District in the development and updates of the District's Regional Water Supply Plan.

Policy 5.2.2.8: The City may cooperate with the South Florida Water Management District to conserve water resources in emergencies and during declared water shortages.

Policy 5.2.2.9: The City may coordinate with the FDEP, the SFWMD, the County, other local municipalities and appropriate agencies in alternative water supply planning efforts.

*Objective 5.2.3: Conserve, appropriately use and protect the environmental quality and living marine resources of estuarine waters through the following policies and enforcement of the Land Development Code.*

Policy 5.2.3.1: The City may continually evaluate the setback, landscape and buffer standards in the Land Development Code and update any portion of the standards that do not adequately protect the County's estuarine and marine resources.

Policy 5.2.3.2: The City shall continue to strictly enforce regulations that direct development away from floodplains and provide upland buffers along the floodplain.

Policy 5.2.3.3: All new marina projects should be compatible with the City's natural resource codes.

Policy 5.2.3.4: Retain river islands in public ownership through designation in the Preservation/Open Space category to serve as green areas, bird roosting, nesting, and feeding

areas and, when appropriate, water-oriented recreation areas.

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Policy 5.2.3.5: Review, revise, and continue to enforce land development regulations consistent with those of the SFWMD and the DEP without exemptions which prohibit new point sources of run-off from discharging into the Indian River Lagoon or the NFSLR for less than the 25-year storm event, and prohibit structures which constrict water circulation.

Policy 5.2.3.6: Institute a public education program targeted at known problem areas regarding dumping of debris and maintenance of stormwater swales.

Policy 5.2.3.7: The City shall update master drainage plans and programs that examine quality and quantity of stormwater, and prioritize improvements for the Capital Improvements Plan and Capital Improvements Element.

*Objective 5.2.4: Conserve, appropriately use and protect the natural functions and purposes of soils and minerals through the following policies and enforcement of the Land Development Code.*

Policy 5.2.4.1: Consider topographic, hydrologic and vegetative cover factors, and appropriate excavation and filling techniques to reduce erosion in the site plan review process of proposed developments.

Policy 5.2.4.2: Review possible revisions to existing mining regulations to better address water use plan, appropriate buffering and rededication requirements of new mining operations.

Policy 5.2.4.3: Enforce land development regulations requiring the establishment and maintenance of buffers between mining activities and adjacent existing and future uses.

*Objective 5.2.5: Conserve, appropriate use and protect fisheries, wildlife, wildlife habitat, marine habitat, and native vegetative communities, including forests and wetlands through the following policies and enforcement of the Land Development Code.*

Policy 5.2.5.1: Continue to enforce standards for open space, wildlife and habitat preservation in conjunction with residential and commercial development.

Policy 5.2.5.2: Implement guidelines and recommendations in the adopted City of Port St. Lucie Conservation Lands Management and Acquisition Plan to allow for the purchase and management of preservation areas in the City.

Policy 5.2.5.3: Review existing measures for species identification and protection to ensure requirements exist for site surveys prior to development and management plans for identified species.

Policy 5.2.5.4: Prohibit the development of marinas in designated manatee critical habitat.

Policy 5.2.5.5: The recommendations of the County's Boating Facility Siting Plan should be utilized for the identification of those areas most appropriate for the location of additional boat ramps for access to coastal waters.

Policy 5.2.5.6: Review, revise as needed, and continue to enforce land development regulations that protect native vegetative communities from destruction by development activities.

Policy 5.2.5.7: The City may 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 significant redevelopment of all site plan projects, for both nonresidential use and residential projects.

Policy 5.2.5.8: The City may consider clustering, micro-siting of structures or other protective mechanisms to preserve, wetlands, wetland functions and other native vegetative communities or protected species habitats.

Policy 5.2.5.9: Review, revise, and continue to enforce land development regulations which at a minimum require a buffer zone of native upland (i.e., transitional) vegetation shall be provided and maintained around wetland and deepwater habitats.

Policy 5.2.5.10: Require submission of comments from appropriate agencies to the City prior to dredge and fill permit issuance to assure compliance with dredge and fill permitting processes.

Policy 5.2.5.11: Continue to coordinate with adjacent local governments to conserve, appropriately use, or protect unique vegetative communities located in more than one local jurisdiction.

Policy 5.2.5.12: The City may coordinate with appropriate agencies to restore or enhance disturbed or degraded natural resources, and programs to mitigate future disruptions and degradation.

Policy 5.2.5.13: The City shall protect native upland vegetative communities, and shall protect listed species and their habitat through the implementation of the City's adopted Natural Resource Code.

Policy 5.2.5.14: Development applicants must comply with state and federal regulations when listed plant and animal populations are on a development site.

Policy 5.2.5.15: An Environmental Assessment Report should be submitted for all future land use map amendments. An Environmental Assessment Report may be required for all development or redevelopment plans that are greater than two acres.

Policy 5.2.5.16: Conservation Trust Funds may only be used for acquisition and management of upland preserves. Development of passive recreation facilities shall be consistent with the permitted principal uses and structures of the Open Space Conservation Zoning District.

*Objective 5.2.6: The City may coordinate with the Department of Environmental Protection to protect natural resources from hazardous wastes.*

Policy 5.2.6.1: The City may continue to offer Amnesty Days to collect hazardous wastes in the City; and may evaluate the need for scheduling local Amnesty Days.

Policy 5.2.6.2: The City may coordinate with the Florida Department of Environmental Protection in providing public information regarding the safe disposal of chemicals. Specifically, information on free disposal of household hazardous wastes, information on disposal contractors available to small businesses and the special waste programs available for landfill disposal of non-typical materials, such as spill clean-ups and contaminated soils may be made available.



**GOAL 5.3: NEW DEVELOPMENT, REDEVELOPMENT AND INVESTMENT IN PUBLIC FACILITIES, UTILITIES AND INFRASTRUCTURE SHALL BE MANAGED AND REGULATED TO REDUCE FLOOD RISK RESULTING FROM HIGH-TIDE EVENTS, STORM SURGE, FLASH FLOODS, STORMWATER RUNOFF, AND THE RELATED IMPACTS OF SEA LEVEL RISE**

Objective 5.3.1: Development and redevelopment in the City shall be planned and managed to reduce risk and losses due to flooding resulting from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea level rise.

Policy 5.3.1.1: The City shall utilize best practices to minimize the disturbance of natural shorelines, which provide stabilization and protect landward areas from storm impacts, where feasible.

Policy 5.3.1.2: The City will maintain shoreline protection and erosion control by:

- A. Facilitating the installation and maintenance of native shoreline vegetation along appropriate areas of beach and
- B. Considering hard structures, such as seawalls, only when alternative options are unavailable.

Policy 5.3.1.3: Development and redevelopment plans and proposals in the coastal high hazard area shall be reviewed for compliance with the goals, objectives and policies of the Comprehensive Plan and other appropriate plans and references, including the City's National Flood Insurance Program (NFIP) and the Community Rating System (CRS) Program.

Policy 5.3.1.4: The City shall seek grant funding in order to prepare a Sea-Level Rise Study which provides mapping and other important data to develop a comprehensive hazard mitigation plan.

Policy 5.3.1.5: The City shall be consistent with, or more stringent than, the flood-resistant construction requirements in the Florida Building Code and applicable flood plain management regulations set forth in 44 C.F.R. part 60.

Policy 5.3.1.6: The City shall require that any construction activities seaward of the coastal construction control lines established pursuant to section 161.053, F.S., be consistent with chapter 161.

Policy 5.3.1.7: The City shall continue to participate in the National Flood Insurance Program Community Rating System administered by FEMA to achieve flood insurance premium discounts for their residents.

Policy 5.3.1.8: The City may develop policies to improve resilience to coastal and inland flooding, saltwater intrusion, and other related impacts of climate change and sea level rise in their Comprehensive Plans, Sustainability Action Plans, Vision Plans, Stormwater Master Plans, Adaptation Action Areas Plans, Climate Change Plans and other city-wide plans.

Policy 5.3.1.9: The City shall encourage the removal of coastal real property located in a FEMA flood zone designation.