

**SEBASTIAN**  
**STORM WATER PARK**  
**LAND MANAGEMENT PLAN**

Prepared for:  
St. Johns River Water Management District  
By:  
City of Sebastian

St. Johns River Water Management District Board Approved March 2009

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## **INTRODUCTION**

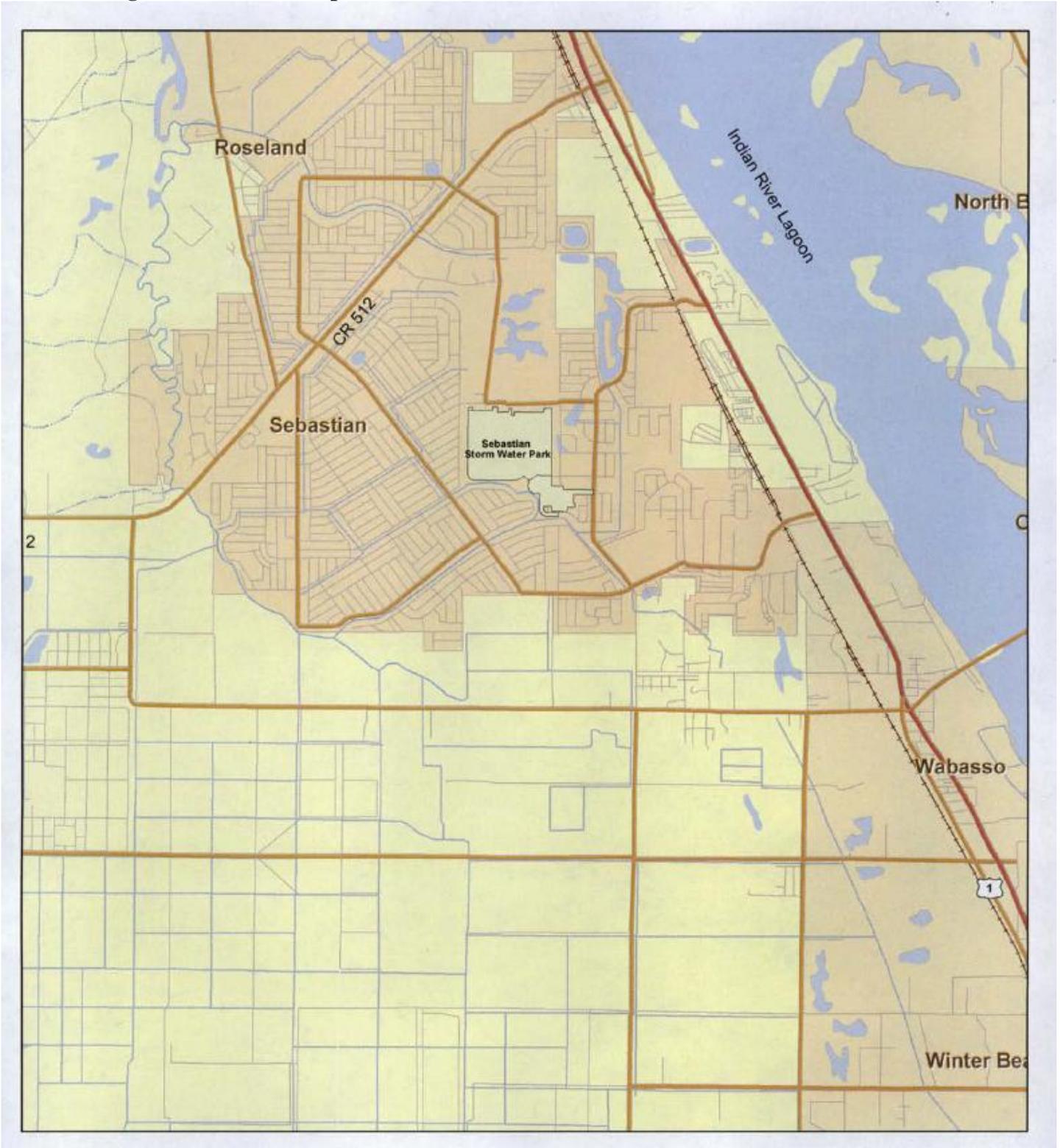
This document provides guidelines for land management activities to be implemented at the Sebastian Storm Water Park in 5-year increments.

The area of proposed management encompasses 175 +/- acre site located within the city limits of Sebastian, Florida and 2 miles west of the Indian River Lagoon in Section 19, Township 31 South, and Range 39 East, Indian River County Florida. (Figure1)

The storm water park boundaries are predominately urban residential. Directly north of the park is mixed urban residential and Sebastian Harbor Preserve Conservation Lands. Adjacent to the storm water park, on the east, is mixed urban residential and the Sebastian Scrub Conservation Area. Bordering the property on the south and west of the park is the Collier Canal Waterway.

This physiographic area is the Eastern Flatwoods District, Sebastian-St. Lucie Flats with an elevation of less than 20 feet. The hydrologic sub basin is the Sebastian River Drainage District within the St. Johns River Water Management District and Indian River Lagoon Basin. Ecological communities of this site are comprised of surface water bodies, uplands, and herbaceous wetlands. The natural ecological process of the storm water park, which in the past was disturbed, may be restored for their intended condition. Maintaining and enhancing the structures, function, and ecological processes of the storm water park will be required for the long-term perpetuation of these original communities.

Figure 1. Location Map



## **1.0 CONSERVATION OVERVIEW**

### 1.1 Regional Significance

This region contains significant ecological diversity for flora and fauna. The facility will function in such a manner as to be compatible with overall stormwater systems both upstream and downstream to promote a pollution treatment approach to providing storm water treatment for an approximate 1400-acre watershed, offering a reduction of pollutants from storm water discharges into the St. Sebastian River, which discharges into the Indian River Lagoon.

A series of trails and placement of benches and picnic tables in certain areas of the park for public enjoyment will be created and maintained by the City of Sebastian Parks & Recreation Department. The City of Sebastian Parks & Recreation Department maintains the park system and may employ contract labor as needed. Volunteer support to help provide interpretive and educational activities, with resource management assistance will be encouraged and coordinated by the Parks & Recreation Department.

An educational display has been designed and installed, located at the trail entrance on Englar Drive and is intended to enhance public knowledge of the problems and subsequent treatment associated with storm water runoff at the storm water park, as well as the importance of wetland and upland systems and their intended condition.

There are no known archeological or historical areas at the storm water park.

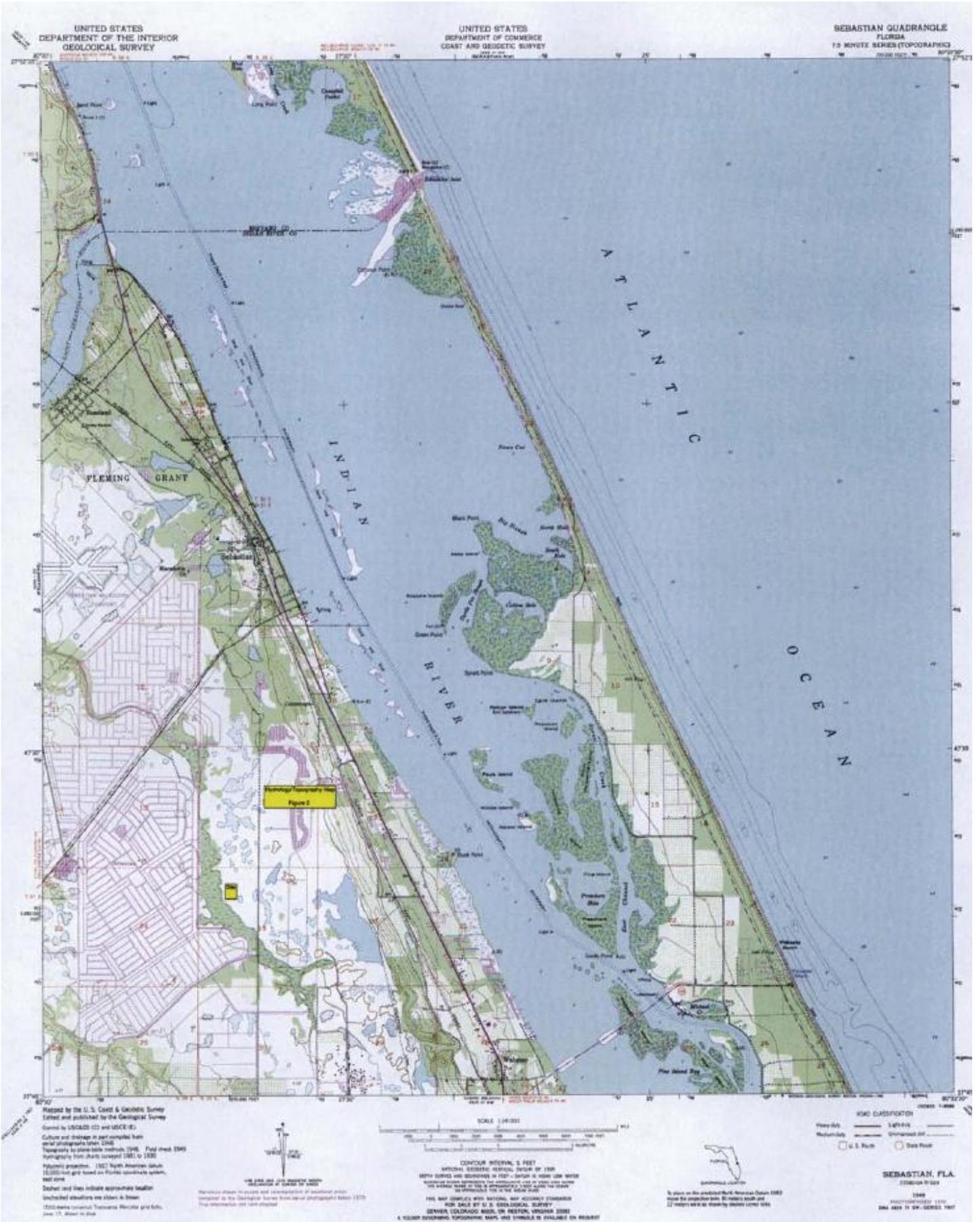
The purpose of the management plan is for the development of resource based passive recreational opportunities, storm water treatment by detention, restoration, and recharge by increasing the hydro-period in the stormwater ponds, and restored wetlands, and natural ecosystem protection.

### 1.2 Acquisition

The property was acquired to protect and enhance the water resource quality and quantity, provide flood protection, and to protect ecological functions and habitat by the development of a storm water park.

The site was originally purchased by Atlantic Gulf Communities to be developed as residential. Two tracts were later sold to Adams & Associates Developers. Adams & Associates Developers re-platted the site to C.C. Unit 1, a subdivision. St. Johns River Water Management District purchased the two tracts from Adams & Associates Developers as Lot 1, containing 144.49 +/- acres in May of 2000 and Lot 2 containing 30.60 +/- acres, in December of 2000. In March of 2006, the St. Johns River Water Management District exchanged 1 acre of the Adams Lot 1 parcel for a residential lot owned by the Sugarick family for District access into the stormwater park.

The property originally contained a natural mix of ecological community types. Historical aerial photographs demonstrate these transitions. North, south, and west of the site contained natural herbaceous, and depressional wetlands, as shown on the hydrologic/topographic map (Figure 2). The construction of the Collier Waterway assisted in the drainage of large areas of the wetlands along the western and southern boundaries. The site contains *Pine Flatwoods*, *Upland Temperate Hammocks*, *Upland Scrub and Pine Hardwoods*, *Cabbage Palm Hammock*, *Mixed Shrub Wetland*, *Hydric Hammock*, and *Grass/Sedge Marsh*.



### 1.3 Zoning

The zoning of the storm water park is RS-10 and represents single-family low-density residential development on lots of 10,000 square feet. This current zoning allows for Parks and Recreation, a compatible use. Parks and recreation promotes environmental education and management as an integral part of park and recreation policies. Cooperative assistance between resource agencies and local educational advisors will provide park and recreation resources as an instrument for environmental teaching and habitat enhancement projects.

The future land use will be revised by December 31, 2008 and designated as Institutional. The City's comprehensive plan identifies Institutional land use for acquisition of land to promote recreation, conservation, natural resource protection, and related benefits of public lands.

### 1.4 Cooperative Agreement

A cooperative agreement was entered into between St Johns River Water Management District and the City of Sebastian, on January 20, 2004, expires January 19, 2009, and auto renews in five-year increments. The purpose of this agreement is to protect and preserve regional wildlife habitat, maintain storm water treatment of the park and Collier Canal in order to address water quality concerns of the St. Sebastian River, a designated impaired water body, which flows into the ultimate receiving waters of the Indian River Lagoon.

### 1.5 Leases, Easements, and Concessions

An existing easement 150 feet by 711.33 and 75 feet by 980 feet containing 4.13 acres more or less, belonging to Florida Power and Light runs along the Eastern boundary of the storm water park. An access easement was granted to the Appelbaum family owning the out parcel of 166.3 feet by 144.5 feet containing .70 acre more or less, located in the southeastern boundary.

There are no leases, or concessions planned at the storm water park. Concessions may be considered in the future to assist in management costs.

## **2.0 NATURAL RESOURCES**

### 2.1 Area of Proposed Management

Prior to the development of the storm water park, this 175-acre area contained many ecological communities. Urbanization, invasive exotic species, and fire suppression are the immediate human-made agents of change to this ecosystem. The ecosystem restoration for the watershed area (including the surrounding the area of the storm water

park) is easily monitored by physical characterization, water quality, water quantity and any impacts to upland or aquatic habitats.

Ensuring compatibility of adjacent land uses, removal of invasive exotic species mechanically, chemically or by hand, working in conjunction with the U S Fish and Wildlife Service, and the Division of Forestry to protect these natural communities will assist in the ecosystem restoration efforts.

## 2.2 Ecological Functions

This site is in a predominantly urban landscape. In an urban landscape, the natural, physical, chemical, and biological processes are disrupted allowing leaves, litter, animal waste, oil greases, heavy metals, fertilizers and pesticides to be transported in storm water runoff and deposited in canals, stream channels, lakes and rivers.

Originally planned for residential development, other impacts to this site occurred and disrupted natural processes of this unique ecological area of the City. Acquisition of the site and the newly constructed storm water park has provided future benefits of water quality and quantity.

The series of storm water detention basins, structural and non-structural BMP's (Best Management Practices) will provide a treatment of the storm water prior to its entry into the wetland areas, which are natural storm water basins of the landscape.

Wetlands are recognized for providing many vital benefits in our watershed such as ground water recharge, improved water quality, flood control, recreational opportunities, wildlife habitat, and aesthetics. Many species of reptiles and amphibians use wetlands during certain stages of their life cycle or throughout their entire lives.

Continued maintenance for the proper functioning of the stormwater structures, erosion issues, pond maintenance, including the pumps, electronic equipment, software, and onsite conveyance structures will be conducted as needed by the City of Sebastian's Public Works Division. The stormwater system consists of four stormwater treatment facilities, a pump station, and numerous water control structures. Operation of the stormwater facilities including the pump station and the adjustable water control structures is the responsibility of the City of Sebastian's Public Works Division. The stormwater system must be operated in accordance with the original park design. A manual containing the design plans for the stormwater park and information regarding operation of the pump station and the water control structures will be provided to the City by the District. The manual will include control elevations for the pump station and all adjustable water control structures.

The City of Sebastian's Parks and Recreation Department will continue maintenance of open areas by mowing and provide maintenance as needed to eradicate any invasive exotic plant species at the park.

This designed storm water treatment train will provide a cleaner final outfall to the Collier Canal Waterway, which discharges into the St. Sebastian River, a designated surface water improvement and management (SWIM) priority water body designated by the State of Florida.

### 2.3 Natural Community Habitat Assessment

Any mitigation in the natural communities that exist on District owned land must be approved in writing by the District and must be held to full cost accounting.

#### *Upland Scrub and Pine Hardwoods.*

There are 18.54 +/- acres of scrub habitat, containing well drained or moderately well drained soil types. This scrub category represents a conglomeration of species found in the upland area. Melaleuca is considered an exotic and aggressively invasive species that along with Brazilian Pepper or any other invasive exotic species will overtake an area. It is an indicator of prior disturbance. Removal of this species and restoration of the habitat as its intended condition can support the Florida Scrub Jay.

The Florida Scrub Jay (*Aphelocoma coerulescens*) and the Gopher Tortoise (*Gopherus polyphemus*) presently occupy this area. Also, this scrub vegetation community occurs within a matrix of poor to moderately well drained flat woods with isolated wetlands and produces a well-defined community to support the Florida Scrub Jay, and other endangered, threatened, or species of special concern.

This community relies on fires that should be completed by mosaic type prescribed burns, with no more than 20% of the community burned at one time. Conducting mosaic prescribed burns in the fire dependant natural communities in this area may not be a feasible option due to the proximity of the large adjacent residential area. Necessary roller chopping as a management alternative will provide for restoration and maintenance of this habitat for its intended condition. Existing ecological communities of the same type are located adjacent to the park offering a higher probability of dispersal of species.

The City of Sebastian and Indian River County, by joint agreement, have an existing Habitat Conservation Plan (HCP) that was adopted in March of 2000. A 2002 HCP developed for the Adams parcel by St. Johns Water Management District, provides for the preservation and management of existing conservation habitat at the storm water park. That 2002 HCP management plan outlines scrub jay surveys, vegetation monitoring and nuisance species control for a five-year period expiring in 2008.

Working with U S Fish and Wildlife Service, the management of the 18.54 acre of scrub habitat may be included into the City of Sebastian Area Wide Scrub Jay Habitat Management Plan (HCP) to increase the amount of conservation scrub habitat in the City, as additional scrub jay compensation areas, by providing annual wildlife surveys, vegetation monitoring using forestry best management practices, and nuisance species control to create optimal scrub jay habitat conditions and dispersal area.

### *Wetlands*

The wetland areas of the site represent a combination of wetlands and surface water ponds, of which .30 acre of forested wetland was filled. A combination of re-hydrated freshwater forested/shrub wetland and freshwater emergent wetlands like the *Cabbage Palm Hammock*, *Mixed Shrub Wetland*, *Hydric Hammock*, and *Grass/Sedge Marsh* are the community types of wetlands associated with the storm water park to comprise approximately 30 acres of wetland habitat that provides nesting, resting, and feeding sites for a variety of migratory birds, as well as many species of reptiles and amphibians that use wetlands during certain stages of their life cycle or throughout their entire lives.

The Southeastern American Kestrel (*Falco sparverius paulus*) has been noted to occupy the Southern *Mixed Shrub Wetland*. The transition area adjacent to this wetland supports a family of three Red Shoulder Hawks. A family of River Otters (*Lutra canadensis*) and several migratory bird species were also noted utilizing the wetland and surface waters of the storm water park.

Prescribed burns may decrease the amount of encroaching shrubby vegetation, but care must be given to the wetland muck areas or organic soils, as fire can destroy the muck layer, prevent regeneration of natural existing species, and cause a succession into woody plant species.

### *Forested Uplands*

*Pine Flatwoods* are common in this region of Florida. The Flatwoods under-story species is normally dominated by saw palmetto, and interspersed with wax myrtle, and gall berry. A wide variety of herbs and brush make up the ground cover. A variety of species utilize this habitat.

Thinning conducted prior to acquisition, wildfire, and previous storm damage has reduced the stocking of pines. The community became similar to *Palmetto Prairie* as a result. In some areas, adequate mature trees survived to serve as a seed source. It appears that regeneration is occurring naturally, however Florida Statute requires public agencies to evaluate lands they manage for timber production. No timber harvests are planned at the storm water park. Thinning of canopy species may become necessary to maintain health of natural communities.

Mosaic prescribed burns are needed within the 1-2 year time frame to reduce the herbaceous ground cover in some areas. Within year 1, roller-chopping the saw palmetto should occur then allow for drying time. City staff will evaluate and monitor the progress of regeneration for forest stand improvement.

*Live Oak* community is often referred to as *Upland Temperate Hammock*, this forest community is one in which live oak is either pure or predominant. The principal associates of this cover type include sweet gum, magnolia, holly and laurel oak. This community is found along the upper banks of the adjacent surface water bodies, which

support species of all types. The Gopher Tortoise (*Gopherus polyphemus*) was identified as an occupant of this community.

Working in conjunction with the Division of Forestry to establish a prescribed burn plan will benefit these communities with minimal impact to the stormwater park and adjacent residential properties. Normally the Division of Forestry will conduct the mosaic burns during the early fall season, paying special attention to the wind direction and uplift patterns to decrease smoke issues.

Upland wildlife habitat and management treatments will be conducted to maintain and conserve these natural areas. Management of areas where adjacent ecological communities come together, called transition zones, will be maintained as fire breaks, access points and/or food plots. Most of these zones currently exist. With proper management regimes, the natural areas will be preserved and serve to protect existing natural resources, archaeological or historical sites if any are found, wildlife habitat, recreational and aesthetic values.

### **3.0 CONSERVATION MANAGEMENT**

#### 3.1 Invasive & Exotic Species

Due to the nature of disturbances to create the storm water park, native and non-native invasive species may invade these areas. Maintenance control is necessary to prevent proliferation of invasive exotic and nuisance plant species, listed by the State of Florida. This can be conducted using herbicidal or mechanical applications. The species most problematic to the storm water park are Brazilian Pepper, Melaluca, Willow, and Cogon Grass. More information is found below:

The Brazilian Pepper (*Schinus terebinthifolius*) can be effectively removed by utilizing the basal bark application method. After cutting as close to the ground as possible, the herbicide should be applied as carefully as possible to the thin layer of living tissue, called the cambium which is just inside the bark where it translocates into roots and stems for complete control. The removal of Brazilian Pepper should be conducted annually between May-October to prevent regeneration of seedlings.

Cogon Grass (*Imperata cylindrica*) exists due to the disturbance from construction of the storm water park. It is invasive and may result in mortality to the future of over story trees in the Pine Flatwoods community due to the flammable oils in the blades of this grass type, causing intensive heat during prescribed burns and reduction of regenerating pines. Herbicidal applications completed after mowing and prior to seed production by cogon grass will reduce the emergence and control maintenance costs.

Foliar spraying may be used for extensive weed control areas but not recommended for use adjacent to other plant species that are non-invasive, wetland or surface water body.

Mechanical methods such as mowing or cutting with heavy equipment can be conducted in larger areas.

The introduction of plants or animals to the storm water park is prohibited unless done pursuant to a land management activity, or permitted by the Florida Fish and Wildlife Conservation Commission per Florida Administrative Code Chapter 68-5.

Monitoring, treatment and control of exotic species is problematic and requires long-term commitment, but vital to maintaining the ecological integrity of natural communities.

### 3.2 Water Resources

The storm water park is located in a dominant urbanized landscape, which may have potential impacts on the water resources at the park. City staff, to identify any potential impacts to the aquatic community, will conduct storm event water sampling of certain parameters, such as temperature, dissolved oxygen, and turbidity. The surrounding urban stormwater runoff control and the treatment design of the storm water park will continue.

A new monitoring well has been constructed at the storm water park. It is located on the Northwestern portion of the site. It will assist the St Johns River Water Management District staff in the effects of status monitoring, basin assessments, and regulatory permitting.

The following operational maintenance activities will be performed by the City on all storm water systems:

- Removal of trash and debris.
- Inspection of inlets and outlets.
- Removal of sediments or nuisance vegetation when the storage volume or conveyance capacity of the stormwater management system is below design levels, which allows easier access.
- Stabilization and restoration of eroded areas.
- Within 24 hours of a storm event, conduct inspections and make necessary repairs.
- The City will inspect, repair, replace and manage the pump system or enter into an annual service contract.

These maintenance activities will assist in protection of the water quality and quantity for the basin area.

### 3.3 Federal and State Protected Species

The storm water park has ecological communities that support endangered, threatened, and species of special concern. The species list is located in Appendix A

## **4.0 RECREATIONAL USES**

### 4.1 Accessibility

The storm water park shall be open to the public for access on foot at all points as shown on the recreational map (Figure 3) except where restricted as needed, by signage.

The storm water park shall be closed to the public during emergency conditions such as floods, severe weather events, wildfires, or during prescribed burns, construction or other land management activities that may represent a danger to the public.

### 4.2 Recreational Activities

- Parking is currently provided at the Englar Drive entrance on the outside of the gate. An opening is provided for entrance to enjoy passive type recreational activities.
- Dogs, cats and other domestic animals of a similar nature, excluding horses or other livestock, are allowed in the stormwater park provided that such animals must be leashed and in owners control, at all times.
- Hiking is allowed at the storm water park except in areas that may be restricted by signs. For the purposes of this subsection, hiking shall include jogging, bird watching, or any other activity where travel is by foot only.
- Bicycling is allowed at the storm water park but only on designated trails or areas.
- Concessions could be located at the storm water park to serve the interest of the public by special use authorization from the City. The City may enter into a negotiated agreement to establish and operate a temporary concession at the storm water park if it is necessary to fulfill a need in the interest of the public and will assist the City in providing for public uses of the park in an environmentally acceptable manner, if it will be economically feasible. This would give the City opportunities to generate revenue to offset management expenses.

Figure 3  
Recreational Map



- Yellow line: Educational Sign
- Cyan line: Property Boundary
- Blue line: Recreational Trail

## 5.0 CONTROL & MANAGEMENT

### 5.1 Security

The primary objective for managing the plant and animal populations in the storm water park is to promote ecological and recreational opportunities and to prevent prohibited activities in the park.

Security for the park will be provided by the City of Sebastian Police Department by patrolling the property to discourage illegal activities and checking that the fences, gates, and boundary markings are in tact. The access gates will be locked at all times, except where the City or Law Enforcement needs to gain access.

### 5.2 Rules & Regulations

- Feral (wild) dogs and cats are prohibited in the stormwater park.
- Use of motorized vehicles, recreation vehicles, motorized and nonmotorized boats and aircraft is prohibited except for local and state law enforcement vehicles, District vehicles, and City approved maintenance access as needed. Boating is prohibited due to the contaminated nature of the water and due to public safety related to heavy stormwater treatment system equipment. Special use authorizations for boating may be considered by the City for scientific, resource, or investigational purposes. The entrances will be posted to notice the public that all boating is prohibited.
- Swimming or diving is prohibited due to the contaminated nature of the water. Special use authorizations for swimming or diving may be considered by the City for scientific, resource management, or investigational purposes. The entrances will be posted to notice the public that swimming is prohibited.
- All fishing is prohibited on the property due to the contaminated nature of the water. Special use authorizations for fishing may be considered by the City for scientific, resource management, or investigational purposes. The entrances will be posted to notice the public that fishing is prohibited.
- Disposal or discharge of any waste such as litter or hazardous substances outside of designated waste collection containers is prohibited.
- The unauthorized removal or destruction of facilities or equipment is prohibited. This includes water control structures, scientific study plots, photo points, transect lines, survey markers, public buildings, towers, recorders, gages, signs, gates fences, or monuments.
- The unauthorized removal or alteration of flora or fauna is prohibited.
- The removal, alteration or destruction of any archaeological or cultural resources is prohibited except as authorized by a City initiated removal conducted for scientific or land management purposes. The City shall consult the Florida Department of State, Division of Historical Resources

prior to authorizing the removal, alteration or destruction of any archeological or cultural resources at the storm water park. Archaeological or cultural resources means associated physical remnants and features contained in the ground including artifacts, fossils, bones, shell mounds, or primitive culture facilities or items. Any person discovering archaeological or cultural resources at the storm water park shall immediately notify the City of such discovery. There are no historical sites known to exist on the property at this time.

- The possession or use of firearms, paint ball guns, fireworks or similar equipment such as any device capable of mechanically propelling an arrow, spear or other projectile is prohibited except as authorized by the City.
- Posting or distributing handbills or circulars, or posting, placing, or erecting any bills, notices, papers, signs or advertising devices or informational matter of any kind, is prohibited except as authorized by the City.
- The City prohibits igniting any fire, or camping at the storm water park except as authorized by the City.
- Trapping and commercial fishing is prohibited at the storm water park except where specifically authorized by the City in conjunction with the Florida Fish and Wildlife Conservation Commission, which shall be limited to scientific study or removal of nuisance species.

## 6.0 IMPLEMENTATION CHART

TASK	RESPONSIBLE LEAD	OCCURANCE	COOPERATORS	RESOURCE PROTECTION AND MANAGEMENT
Foliar & Basal Bark Treatment	COS	Ongoing		Continue to eradicate exotic and invasive vegetation, with mechanical, chemical or by hand treatments.
Mowing, Trimming	COS	Ongoing		Continue to keep maintenance and recreational pathways cleared, trim trees as needed.
Security	COS	Ongoing	FWS	Maintain signage, fences and gates. Coordinate with City Police Department for regular surveillance of the property. Report evidence of poaching and other illegal activity to local law enforcement and provide them with support as needed.
Restoration	COS	1 yr	DOF, FWS	Develop and implement a fire management plan to include burn zones in order to maintain and restore native community structures. Continue to inspect restoration initiatives.
Listed Species Plants & Animals	COS	1 yr	FWS, IRC	Conduct surveys in key communities to support habitat management Continue to maintain and build upon species list.
Water Resources	COS	Ongoing	SJRWMD	Manage stormwater park and associated equipment. Continue to monitor hydrologic effects. City staff will conduct inspection and water sampling after storm events, and compile wetland monitoring data annual
Fire Management	COS	1 yr, 3 yr	DOF, FWS	Follow prescribed burn plan, maintain fire breaks in close proximity to residential properties. Roller chop areas of saw palmetto  3 yr-5yr scheduling allows for vegetative refueling.

### Key

COS	City of Sebastian	SJRWMD	St John' s River Water Management District
FWS	US Fish & Wildlife	IRC	Indian River County
DOF	Division of Forestry		

## APPENDIX A LISTED ANIMALS

Note: State and Federally listed wildlife species that may utilize the Sebastian Storm Water Park.

T-Threatened, E-Endangered, SSC-Species of Special Concern, \*-Not Federally Listed,

C2-Candidate for future listing possible.

USFWS-U.S. Fish & Wildlife Service

FGFWFC-Florida Game & Freshwater Fish Commission

Scientific Name	Common Name	Status	
		USFWS	FGFWFC
<b>BIRDS</b>			
<i>Aphelocoma coerulescens</i>	Florida Scrub Jay	T	T
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	T	C2
<i>Pandion haliaetus</i>	Osprey	*	SSC
<i>Grus canadensis pratensis</i>	Florida Sandhill Crane	*	T
<i>Mycteria americana</i>	Woodstork	E	E
<i>Egretta caerulea</i>	Little Blue Heron	*	SSC
<i>Egretta guarana</i>	Limpkin	*	SSC
<i>Egretta tricolor</i>	Tricolored Heron	*	SSC
<i>Eudocimus alba</i>	White Ibis	*	SSC
<b>AMPHIBIANS/REPTILES</b>			
<i>Gopherus polyphemus</i>	Florida Gopher Tortoise	T	T
<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	T	T
<i>Pituophis melanoleucus</i>	Florida Pine Snake	C2	SSC
<i>Mugitus</i>			
<i>Rana capito aesopus</i>	Florida Gopher Frog	C2	SSC
<b>MAMMALS</b>			
<i>Polomys floridanus</i>	Florida Mouse	C2	SSC

## APPENDIX B FNAI PLANTS, ANIMALS & COMMUNITIES LIST

Note: This is not a comprehensive list of all species and natural communities occurring in this location. Only occurrences documented in the FNAI database are included. Species indigenous to beach dune, coastal strand, and maritime hammock habitats were removed, unless the species would rely on flora and fauna of these communities.

### SEBASTIAN STORM WATER PARK

### INDIAN RIVER COUNTY

Last Updated:  
June 2008

#### Plants and Lichens

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
<i>Conradina grandiflora</i>	Large-flowered Rosemary	G3	S3	N	LT
-					
<a href="#"><i>Dicerandra immaculata</i></a>	Lakela's Mint	G1	S1	LE	LE
-					
<a href="#"><i>Tillandsia Utriculata</i></a>	Giant Wild Pine	G?	S?		LE
-					
<a href="#"><i>Harrisia simpsonii</i></a>	Simpson's Prickly Apple	G2	S2	N	LE
-					
<a href="#"><i>Lechea cernua</i></a>	Nodding Pinweed	G3	S3	N	LT
-					
<a href="#"><i>Ophioglossum palmatum</i></a>	Hand Fern	G4	S2	N	LE
-					
<a href="#"><i>Vittaria lineata</i></a>	Shoestring Fern	G?	G?	?	LE

#### Grasshoppers and Allies

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
-					
<a href="#"><i>Melanoplus indicifer</i></a>	East Coast Scrub Grasshopper	G1G2	S1S2	N	N
-					
-					

## **Beetles**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<a href="#"><i>Aphodius troglodytes</i></a>	Gopher Tortoise Aphodius Beetle	GNR	S2S3	N	N

## **Amphibians**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<a href="#"><i>Rana capito</i></a>	Gopher Frog	G3	S3	N	LS

## **Reptiles**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<a href="#"><i>Alligator mississippiensis</i></a>	American Alligator	G5	S4	SAT	LS
<a href="#"><i>Drymarchon couperi</i></a>	Eastern Indigo Snake	G3	S3	LT	LT
<a href="#"><i>Gopherus polyphemus</i></a>	Gopher Tortoise	G3	S3	N	LT
<a href="#"><i>Lampropeltis getula</i></a>	Common Kingsnake	G5	S2S3	N	N
<i>Elaphe guttata</i>	Red Rat Snake	G?	G?	?	LS

## **Birds**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<a href="#"><i>Accipiter cooperii</i></a>	Cooper's Hawk	G5	S3	N	N
<a href="#"><i>Aimophila aestivalis</i></a>	Bachman's Sparrow	G3	S3	N	N
<a href="#"><i>Ammodramus savannarum floridanus</i></a>	Florida Grasshopper Sparrow	G5T1	S1	LE	LE
<a href="#"><i>Aphelocoma coerulescens</i></a>	Florida Scrub-jay	G2	S2	LT	LT
<a href="#"><i>Anas fulvigula</i></a>	Mottled Duck				
<a href="#"><i>Aramus guarana</i></a>	Limpkin	G5	S3	N	LS

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<u>Ardea alba</u>	Great Egret	G5	S4	N	N
<u>Ardea herodias occidentalis</u>	Great White Heron	G5T2	S2	N	N

<b>Birds</b>	<b>Common Name</b>	<b>Global</b>	<b>State</b>	<b>Federal</b>	<b>State</b>
<b>Scientific Name</b>		<b>Rank</b>	<b>Rank</b>	<b>Status</b>	<b>Status</b>
<u>Athene cunicularia floridana</u>					
<u>Egretta caerulea</u>	Little Blue Heron	G5	S4	N	LS
<u>Egretta rufescens</u>	Reddish Egret	G4	S2	N	LS
<u>Egretta thula</u>	Snowy Egret	G5	S3	N	LS
<u>Egretta tricolor</u>	Tricolored Heron	G5	S4	N	LS
<u>Elanoides forficatus</u>	Swallow-tailed Kite	G5	S2	N	N

<b>Birds</b>	<b>Common Name</b>	<b>Global</b>	<b>State</b>	<b>Federal</b>	<b>State</b>
<b>Scientific Name</b>		<b>Rank</b>	<b>Rank</b>	<b>Status</b>	<b>Status</b>
<u>Eudocimus albus</u>	White Ibis	G5	S4	N	LS
<u>Falco columbarius</u>	Merlin	G5	S2	N	N
<u>Falco peregrinus</u>	Peregrine Falcon	G4	S2	N	LE
<u>Falco sparverius paulus</u>	Southeastern American Kestrel	G5T4	S3	N	LT
<u>Grus canadensis pratensis</u>	Florida Sandhill Crane	G5T2T3	S2S3	N	LT
<u>Haliaeetus leucocephalus</u>	Bald Eagle	G5	S3	N	LT
<u>Ixobrychus exilis</u>	Least Bittern	G5	S4	N	N
<u>Laterallus jamaicensis</u>	Black Rail	G4	S2	N	N
<u>Mycteria americana</u>	Wood Stork	G4	S2	LE	LE

<u><i>Nyctanassa violacea</i></u>	Yellow-crowned Night-heron	G5	S3	N	N
<u><i>Nycticorax nycticorax</i></u>	Black-crowned Night-heron	G5	S3	N	N

### **Birds**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<u><i>Pandion haliaetus</i></u>	Osprey	G5	S3S4	N	LS*
<u><i>Picoides villosus</i></u>	Hairy Woodpecker	G5	S3	N	N
<u><i>Plegadis falcinellus</i></u>	Glossy Ibis	G5	S3	N	N
<u><i>Vireo altiloquus</i></u>	Black-whiskered Vireo	G5	S3	N	N

### **Mammals**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<u><i>Podomys floridanus</i></u>	Florida Mouse	G3	S3	N	LS

### **Natural Communities**

<b><u>Scientific Name</u></b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Status</b>
<u><i>Depression marsh</i></u>		G4	S4	N	N
<u><i>Floodplain marsh</i></u>		G3?	S2	N	N
<u><i>Mesic flatwoods</i></u>		G4	S4	N	N
<u><i>Scrub</i></u>		G2	S2	N	N
<u><i>Scrubby flatwoods</i></u>		G3	S3	N	N

Definition of Global (G) element ranks:

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very little remaining area, e.g., <2,000 acres) or because of some factor(s) making it especially vulnerable to extinction;

G2 = Imperiled globally because of rarity (6-20 occurrences or very little remaining area, e.g., <10,000 acres) or because of some factor(s) making it very vulnerable to extinction throughout its range;

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range, 21 to 100 occurrences;

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery;

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery;

G? = uncertain Global rank.

Definition of State (S) element ranks:

S1 = Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very little remaining area) or because of some factor(s) making it especially vulnerable to extinction;

S2 = Imperiled in state because of rarity (6-20 occurrences or little remaining area) or because of some factor(s) making it very vulnerable to extinction throughout its range;

S3 = Rare or uncommon in state (on the order of 21 to 100 occurrences);

S4 = Apparently secure in state, although it may be rare in some parts of its state range;

S5 = Demonstrably secure in state and essentially ineradicable under present conditions;

S? = uncertain State rank.

## APPENDIX C ECOLOGICAL COMMUNITY OCCURRENCE BY SOIL SERIES

### NATURAL RESOURCES CONSERVATION SERVICE

Note: Soil series are based on pre construction conditions of the ecological community types. These are based on the Soil Conservation Service (SCS) Communities, not the Florida Land Use, Cover and Forms Classification System (FLUFCS). (Figure 4)

Soil Type/Symbol	Ecological Community Type
Chobee Loamy Fine Sand (2)	Cypress Swamp Swamp Hardwoods Freshwater Marsh & Ponds
Immokalee Fine Sand (4) Immokalee Fine Sand, depressional	South Florida Flatwoods Freshwater Marsh & Ponds
Oldsmar Fine Sand (6) Oldsmar Fine Sand, depressional	South Florida Flatwoods Cabbage Palm Flatwoods Freshwater Marsh & Ponds
Riviera Fine Sand (10) Riviera Fine Sand, depressional	Cabbage Palm Flatwoods Wetland Hardwood Hammock Slough  Cypress Swamp Cypress Hardwood Freshwater Marsh & Ponds
Pineda Fine Sand (16) Pineda Fine Sand, thermic variant	South Florida Flatwoods Slough Wetland Hardwood Hammock Slough
Arents, 0 to 5 percent slopes (23)	Normally disturbed by human events, not attributed to specific horizons
Malabar Fine Sand (39) Malabar Fine Sand, depressional	South Florida Flatwoods Slough Freshwater Marsh & Ponds Cypress Swamp
Holopaw Fine Sand (47) (Altered, pre construction)	Wetland Hardwood Hammock Slough

