



**PLATT'S CREEK STORMWATER QUALITY IMPROVEMENT
ST. LUCIE COUNTY, FLORIDA**

**FINAL REPORT
FDEP 319 Grant (G0064)
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INTRODUCTION

In 2002 the State of Florida Department of Environmental Protection (FDEP) and the St. Lucie County Board of County Commissioners (County) entered into a Section 319 Non-Point Source Management Program Grant Agreement (G0064) for the construction of the Platt's Creek Stormwater Retrofit (Phase I & II). The project proposed the decommissioning of approximately 102 acres of existing citrus groves directly adjacent to Platt's Creek and the North Fork of the St. Lucie River (NFSLR). The project also proposed the construction of a 16 acre wet detention area adjacent to Platt's Creek along with the necessary diversion weir and pump station required to deliver runoff to the system.

This project discharges into the North Fork of the St. Lucie River and is located off of Sunrise Boulevard as indicated in Exhibit-1 (attached). The Surface Water Improvement and Management (SWIM) Act was established in 1987 by the Florida Legislature. This Act recognized that water quality and habitats in surface water throughout the state had degraded or were in danger of being degraded. The Act requires the five State Water Management Districts to maintain a priority list of water bodies of significance within their boundaries, and develop plans and programs for their improvement. The St. Lucie River is part of the South Florida Water Management District's SWIM Program.

The project was broken up into the following phases:

Phase 1

- Task 1 - Predesign Monitoring
- Task 2 - Conceptual Approval
- Task 3 - Design and Permitting
- Task 4 - Land Acquisition

Phase 2

- Task 5
 - Project Construction
 - Alum Injection
- Task 6 - Water Quality Monitoring

The County submitted Phase 1 of this project to FDEP for 319(h) funding during the FY 2002 Funding Cycling. The County was awarded another grant in FY 2003 to assist with the Phase 2 portion of this project.

PROJECT INFORMATION

Platt's Creek is located within the unincorporated limits of St. Lucie County, approximately three miles south of the City of Fort Pierce, on the west side of Sunrise Boulevard along the waters of the NFSLR. Platt's Creek serves as the primary conveyance for a drainage basin of over 1,000 acres. The majority of the mixed land use basin has been developed without water quality treatment for stormwater runoff. The project site is comprised of a 102 acre tract, of which, 16.0 acres has been designated as a stormwater management facility. St. Lucie County intends to

use the remainder of the site as a mitigation bank, which will be a mixture of hydric flatwoods, hammock, freshwater march and forested floodplain.

This project involved the purchase and decommissioning of approximately 102 acres of existing citrus groves directly adjacent to Platt's Creek and the North Fork of the St. Lucie River. Improvements included the construction of a 16 acre wet detention area adjacent to Platt's Creek along with the necessary diversion weir and pump station required to deliver runoff to the system. An alum addition facility is under construction. This facility will inject alum into the stormwater prior to the wet detention area. The system provides water quality treatment for a 1,000 acre mixed use drainage basin. The stormwater detention area provides 84 acre-feet of detention and has the capability of releasing treated runoff to the NFSLR.

Project Location

Platt's Creek is located within the unincorporated limits of St. Lucie County and is a natural tributary to the NFSLR. Additionally, it forms the site's southern boundary. A 34-acre South Florida Water Management District (SFWMD) preserve borders the south side of Platt's Creek. A single family subdivision is adjacent to the northern boundary line and a six acre Audubon Society preserve is located on the northwest boundary.

The project parcel contains 3,100 feet of frontage on the NFSLR, 2,440 feet of frontage on Platt's Creek, and 1,620 feet on Sunrise Boulevard.

PROJECT FUNDING

The original project funding listed by task is shown in Table 1 below.

Table 1: Original Budget by Task

<u>Tasks</u>	<u>319(h) Funds</u>	<u>Non-Federal Match</u>	<u>Total</u>
Task 1 - Pre Design Monitoring	--	\$ 12,710	\$ 12,710
Task 2 - Conceptual Approval	--	\$ 7,020	\$ 7,020
Task 3 - Design Permitting	--	\$ 170,630	\$ 170,630
Task 4 - Land Acquisition	--	\$ 167,843	\$ 167,843
Task 5	--	\$ --	\$ --
• Project Construction	\$ 400,000	\$ 1,745,000	\$ 2,145,000
• Alum Injection	\$ 130,000	\$ --	\$ 130,000
Task 6 - Water Quality Monitoring	--	\$ 45,000	<u>\$ 45,000</u>
	\$ 530,000	\$ 2,148,203	\$ 2,678,203

The grant contract did not include funds for the design and permitting task; however, St. Lucie County did expend funds for these services. The total cost and percentage given for Actual Expenditures reflect these design costs. Without Design and Land Acquisition the percentages would be 16.5 percent for 319(h) Funds and 83.5 percent for Matching Funds. Additional Non-Federal Matching funds came from the Statewide Surface Water Restoration and Waste Water Project (SLIT) and the St. Lucie County Municipal Service Tax Unit. Table 2 (below) indicates the actual expenditures.

Table 2: Actual Project Expenditures

<u>Tasks</u>	<u>319(h) Funds</u>	<u>Matching Funds</u>	<u>Totals</u>
Design	\$ -	\$ 321,680	\$ 321,680
Land Acquisition	\$ -	\$ 11,552	\$ 11,552
Construction	\$ 530,000	\$ 2,676,243	\$ 3,206,243
WQ Monitoring	\$ -	\$ -	\$ -
Education	\$ -	\$ -	\$ -
Total Costs	\$ 530,000	\$ 3,009,475	\$ 3,539,475
Percentages (%)	15	85	

PROJECT OBJECTIVE

The objective of this project was to provide water quality treatment for the entire 1,000+ acre watershed. The onsite water quality was provided by a 16 acre stormwater management facility which provides approximately 84 acre-feet of detention or the first flush for the 1,000+ acre watershed. The following project objectives were accomplished during Phase 1 and Phase 2 of this project:

- Provided water quality for a 1,000 + acre basin.
- Eliminated runoff from 102 acres of active citrus groves directly adjacent to the NFSLR.
- Reduced fresh water discharges to the NFSLR.
- Provided a mechanism to attenuate flow so that overall basin discharge is slower and less detrimental to the NFSLR.

WATERSHED DESCRIPTION

Regional Watershed Boundary

Platt's Creek is 193 square miles located within the NFSLR drainage basin, the largest drainage basin within the St. Lucie Estuary (SLE) Watershed, a subbasin of the Indian River Lagoon Watershed. The SLE receives runoff from a large portion of Martin and St. Lucie County and its waters ultimately merge with the southern Indian River Lagoon near the City of Stuart. The St. Lucie River is a major branch, which allows freshwater to flow to the Indian River Lagoon.

The NFSLR begins south of Fort Pierce, at the confluence of Five and Ten Mile Creeks, and flows through the City of Port St. Lucie to the SLE. Because of past dredging that provided drainage through the NFSLR and its tributaries, the freshwater from agricultural and urban areas of St. Lucie County often reaches the estuary at a faster rate than can be diluted by saltwater. This unstable salinity balance has been identified as a major cause for concern regarding the health of the estuaries and their marine species.

The NFSLR only partially meets its Class III water body designation. According to FDEP water quality reports, construction activity, agricultural runoff and industrial park runoff constitute a potential threat to the water quality in the segment of the river bordered by the Platt's Creek Project. Five and Ten Mile Creeks, upstream of the project exhibit poor water quality due to runoff from citrus with high levels of pesticides. The majority of agricultural lands are located to the west of Ten and Five Mile Creeks and reach these water bodies prior to flowing into the segment located adjacent to the project site. Exhibit-2 (attached) indicates the extent of the watershed that the project serves.

Hydrologic Character

The Platt's Creek project is located along the shores of the NFSLR, a Blackwater Stream system, and Platt's Creek Branch, a natural tributary. Tidal influences in the river reach north of Platt's Creek parcel to Five and Ten Mile Creek, just west of the Florida Turnpike.

The potential of the NFSLR to function as a producing ecosystem has been adversely affected by past dredging activities, development and exotic plant species. Beginning in the 1920's, dredging projects were implemented to provide wetland drainage and flood control in the NFSLR Basin. Straightening of the river channel resulted in cutting off oxbows from the main channel and producing spoil banks along the edges of the dredged area. The artificially high banks prohibit the natural inundation of the floodplain and many areas have become colonized by invasive exotic species, particularly Brazilian Pepper (*Schinus terebinthifolius*).

Vegetative Character

The subject parcel historically consisted of floodplain swamp, basin marsh and hydric hammock communities.

Soils

The soils (GIS) database created for the SFWMD contains all the available soil classifications per the SCS Soil Survey of St. Lucie County (USDA, 1984). Based on this information, the soil types on the subject parcel include:

- 48 Wabasso (20 acres) - nearly level, poorly drained soils; the subsoil is dark and sandy in the upper part and loamy in the lower part or is loamy within a depth of 20 inches. These soils historically included flatwoods on the elevated portions of the parcel along Sunrise Boulevard and hydric hammock in the lower elevations.

- A Ankona (5 acres) - nearly level, poorly drained soil; the subsoil is dark, sandy and weakly cemented in the upper part and loamy in the lower part below a depth of 40 inches. These soils, which are located along Platt's Creek, appear to have been covered by a mix of Hydric hammock and mesic flatwoods.
- 43 Susanna (31 acres) - poorly drained, nearly level soils of the flatwoods. The water table of Susanna sand is at a depth of less than 10 inches for 1 to 4 months. Historically, this soil type appears to have supported Slash Pine Flatwoods with an understory of saw palmetto, gallberry, blueberry, fetterbush, etc.
- 38 Rivera (12 acres) - poorly drained, nearly level soils in hammocks and along drainage ways. This area appears to have historically supported floodplain marsh within the lower elevations and floodplain forest at higher elevations.
- 4 Arents (34 acres) - within the floodplain areas of the parcel where the spoil from the dredged of the North Fork were deposited. These lands were historically slough, marshes and swamps that were altered by filling of small oxbows and drainage ways of the river. The arents soils on this site area appear to have been Fluvaquent soils which are generally described as "very poorly drained, nearly level on flood plains of rivers and creeks". This soil appears to have supported floodplain forest plant associations, which appear on parcels adjacent to the site.

LAND ACQUISITION

102-acre parcel of land was acquired for the implementation of the Platt's Creek project including the necessary pre-purchase surveying and environmental assessments. This was done as part of Task 4 under Phase 1.

PROJECT DESIGN

St. Lucie County retained the services of Hazen and Sawyer to design the Platt's Creek facilities in 2001. The design was originally permitted in April 2003 by the SFWMD (Permit #56-00003-M) which has been extended until 2013.

The onsite improvements included the construction of a stormwater pumping station, diversion weir and a detention area. Exhibit-3 (attached) indicates the location of the improvements.

The project was designed to capture the first flush of runoff for the basin which equates to 0.66 inches of runoff for all storm events. Approximately 84 acre-feet of detention storage has been provided for this basin. It is anticipated that between 50 percent and 80 percent of overall pollutant loading (dependent upon the particular parameter) will be removed.

CONSTRUCTION

The construction was competitively bid and awarded to WPC Industrial Contractors, Inc. (WPC) in March 2004. The Platt's Creek Stormwater Improvements were constructed between March 2004 and August 2006. The original construction cost was \$2,745,740 (as estimated by WPC). The final construction cost was \$2,976,046 (due to Change Orders). The alum injection system was competitively bid and awarded to Close Construction in March 2008. Construction is scheduled to be finished by August 2008. The original construction cost was \$230,197.

In total, the Platt's Creek Stormwater Quality Improvement Project cost was \$3,539,475 for land acquisition, design and construction. The 319 Grant contributed \$530,000 towards the construction cost, or 15 percent of the final project cost. The stormwater pumping station, detention system and diversion weir were constructed and the alum injection system is currently under construction.

Construction photographs documenting the project construction are provided in Appendix A.

ESTIMATED POLLUTANT LOAD REDUCTION & WATER QUALITY MONITORING PROGRAM

Upon completion, it is anticipated that this project will provide a removal rate between 50 percent and 80 percent for various parameters. To date no monitoring has occurred because the proposed alum injection that will feed into the pump station and flow into the stormwater treatment area/attenuation area has not been placed into operation.

EDUCATIONAL COMPONENTS

Please refer to Appendix B for a newsletter article that was published about this project.

Appendix A - Construction Photographs

















Appendix B - Newsletter Article

Platt's Creek Water Quality/Wetland Restoration Project

St. Lucie County Project to Restore Wetland Habitat and Improve Water Quality in the NFSLR

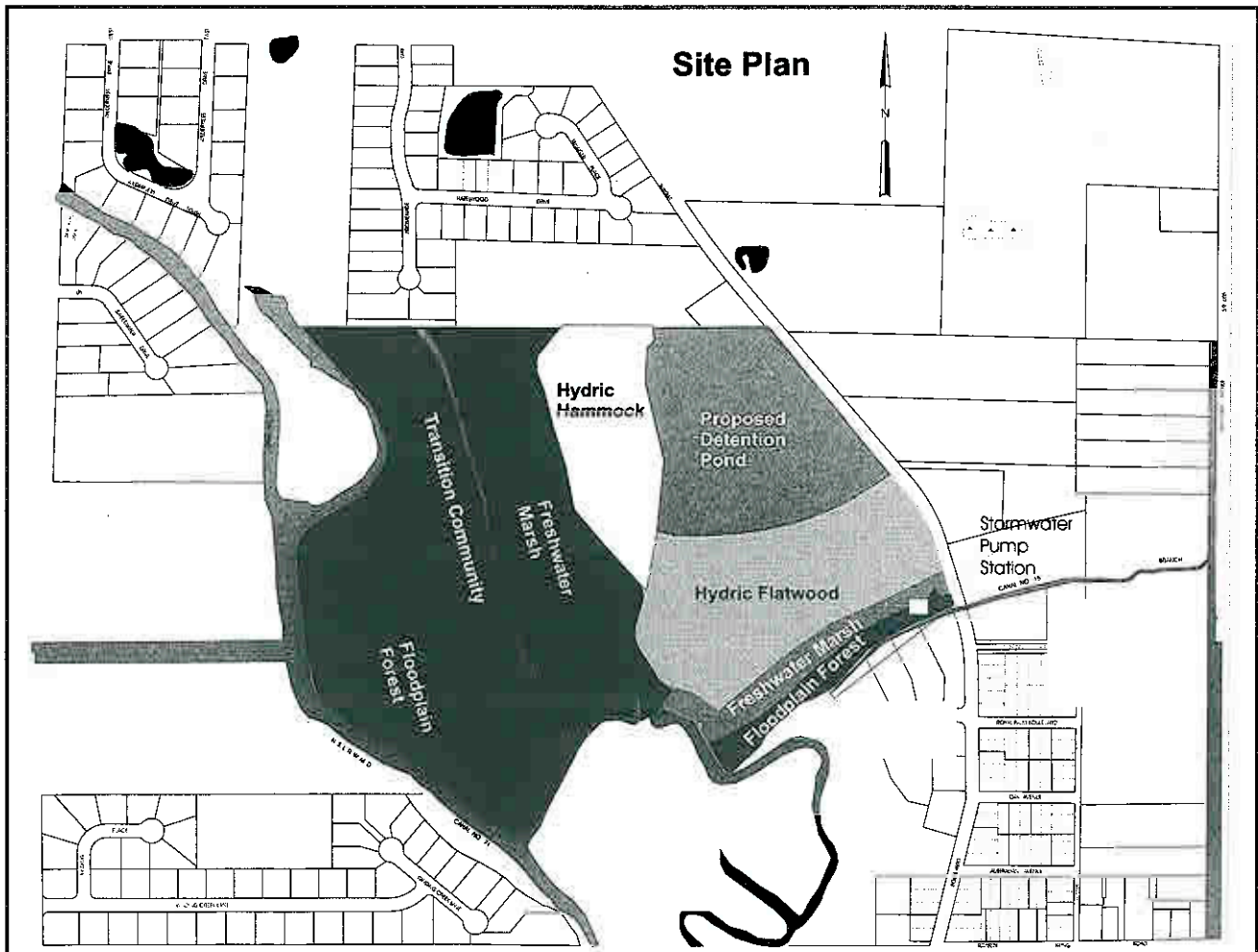
Along the banks of the North Fork of the St. Lucie River (NFSLR) the Floodplain forest gives way to ... "citrus trees?". Yes, where floodplain hardwoods once provided natural water storage and protected the fragile riverine shoreline sits a 100-acre orange grove. But, if St. Lucie County has its way, this will not be the case much longer. In December 1999, the County completed the purchase of the 102-acre tract, moving one step closer to completing a project which has been in the works for several years. Finally, after years of persistence, the proposed Wetland Restoration and Stormwater Treatment project is in the design and permitting stage.

The project was driven strongly by the County's desire to provide in-County mitigation for local wetland impacts. The 85+ acre Mitigation Bank provides an option to off-set unavoidable wetland impacts in a manner that provides true

ecological benefits in the St. Lucie Estuary Watershed. The project site is ideal. Located at the confluence of the NFSLR and Platt's Creek, it helps close an existing gap in the greenway corridor along the NFSLR and furthers goals to protect the rivers shoreline and improve water quality. As the project evolved, the County realized that the location of the site (directly adjacent to the downstream reaches of Platt's Creek) also made it an outstanding candidate for a stormwater retrofit facility.

Platt's Creek serves as the primary drainage conveyance for a drainage basin of over 1,000-acres. The majority of the land in the mixed use basin is developed without water quality treatment for stormwater runoff. By utilizing approximately 16-acres of the 102-acre tract for a stormwater management facility, water quality treatment can be

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Platt's Creek Water Quality/Wetland Restoration Project *continued*

provided for the first flush of runoff from the entire 1,000+ acre basin. The remainder of the site will be restored to a mixture of Pine flatwoods, Hydric hammock, Freshwater marsh and Forested floodplain. The cost of restoration is expected to be paid for from the sale of wetland mitigation credits. The current mitigation plan has been developed in coordination with various regulatory agencies including South Florida Water Management District (SFWMD), US Army Corp of Engineers (ACOE) and Florida Department of Environmental Protection (FDEP).

Upon completion, the Platt's Creek Wetland Restoration and Stormwater Treatment Area will:

- Provide mitigation bank facilities within St. Lucie County and the St. Lucie Watershed.
- Provide water quality treatment for a 1,000+ acre urbanized drainage basin .
- Eliminate agricultural runoff from 102 acres of active citrus groves directly adjacent to the NFSLR.
- Provide overall reduction in fresh water released to the NFSLR and attenuate flow to NFSLR.
- Restore/Create 85+ acres of wetland habitat directly adjacent to Platt's Creek and the NFSLR.
- Provide additional wetland habitat for fish and wildlife along the NFSLR corridor.
- Restore natural storage and water purifying functions along the river's floodplain.

