

2014 PROGRESS REPORT

for the Central Indian River Lagoon Basin Management Action Plan

prepared by the
Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection
Tallahassee, FL 32399

in cooperation with the
**Central Indian River Lagoon Basin
Technical Stakeholders**

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This 2014 Central Indian River Lagoon BMAP Progress Report was prepared as part of a statewide watershed management approach to restore and protect Florida's water quality. It was prepared by the Florida Department of Environmental Protection in cooperation with the Central Indian River Lagoon stakeholders.



Fellsmere Water Control District

Fort Pierce Farms Water Control District

Indian River Farms Water Control District

Sebastian River Improvement District

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LIST OF ACRONYMS AND ABBREVIATIONS

BMAP	Basin Management Action Plan
BMP	Best Management Practice
BRL	Banana River Lagoon
Department	Florida Department of Environmental Protection
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FYN	Florida Yards and Neighborhood (Program)
GIS	Geographic Information System
IRL	Indian River Lagoon
lbs/yr	Pounds Per Year
MAPS	Managed Aquatic Plant Systems
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PSA	Public Service Announcement
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
USJR	Upper St. Johns River
WBID	Waterbody Identification
WCD	Water Control District

SUMMARY

TOTAL MAXIMUM DAILY LOADS (TMDLS)

The Central Indian River Lagoon (IRL) Basin Management Action Plan (BMAP) was adopted in February 2013 to implement the nutrient TMDLs within the watershed. The BMAP includes management strategies or projects that are to be implemented by the responsible entities. This 2014 Progress Report is the first annual progress report for the Central IRL BMAP, and it describes the implementation activities that occurred during the reporting period from February 7, 2013 through February 28, 2014.

The total nitrogen (TN) and total phosphorus (TP) TMDLs for the main stem of the IRL Basin were adopted by the Florida Department of Environmental Protection in March 2009. The TMDLs focus upon the water quality conditions necessary for seagrass re-growth at water depth limits where seagrass historically grew in the basin, based on a multi-year composite of seagrass coverage. The median depth limits of seagrass coverage in the IRL Basin decreased over the years due to changes in water quality conditions resulting from human (anthropogenic) influences.

ACTIVITIES DURING THE REPORTING PERIOD

During the reporting period, Brevard County completed two projects, the City of Fellsmere completed one project, the City of Sebastian completed one project, the Florida Department of Transportation (FDOT) District 4 completed four projects, Indian River County completed three projects, and the Town of Orchid completed one project. For the projects that could be quantified, these projects resulted in an estimated reduction of 14,260 lbs/yr of TN and 3,002.4 lbs/yr of TP. These reductions are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date, for those projects that could be quantified, are 40,906.3 lbs/yr of TN and 10,179.7 lbs/yr of TP.

SEAGRASS TARGET EVALUATION

The intent of the IRL Basin TMDLs is to recover the deeper water seagrass habitats, with the biological response of the seagrass being the most important factor in evaluating success in achieving TMDL targets. To assess progress for the IRL Basin towards the median seagrass depth limit target, a two-step process was used. Step 1 is a seagrass frequency distribution analysis and Step 2 is a median seagrass depth evaluation. If seagrass in a project zone passes both evaluation steps, no nutrient reductions are required by the stakeholders in that project zone. The Department recently conducted this two-step

evaluation using seagrass data from 2006, 2007, 2009, and 2011, which were the latest datasets available at the time of the analysis. Based on this time period, the Central A, Central SEB, and Central B project zones were Step 1 and Step 2 compliant. However, in 2011, an algal superbloom occurred in the North IRL and Banana River Lagoon, with a separate bloom affecting part of the Central IRL. Then, a brown algal bloom affected much of the IRL during 2012. Based upon these recent blooms and concern for the health of the IRL, the stakeholders in the Central IRL identified and implemented projects during this first phase of the BMAP even though Step 1 and Step 2 of the TMDL target analysis were compliant. The full impact to seagrass from these blooms will not be known for a number of years, but there are documented losses of seagrass in the Central IRL linked to the blooms.

The results of 2013 seagrass mapping are expected to be complete by the end of summer or early fall 2014. The median values for 2013 and composite frequency distribution for 2007, 2009, 2011, and 2013 will then be compared to the TMDL targets to determine the status of seagrass restoration.

The St. Johns River Water Management District began their response to the blooms through the IRL Initiative in spring 2013 with a series of research and data collection investigations into the potential causes of the blooms. The understanding gained through the Initiative is expected to aid in defining the future actions of the BMAP.

Section 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the first annual progress report for the Central Indian River Lagoon (IRL) Basin Management Action Plan (BMAP). **Section 2** describes the accomplishments during the period from February 7, 2013 through February 28, 2014. **Section 3** summarizes the evaluation of progress towards the seagrass depth limit targets. A summary of efforts for the upcoming year (March 1, 2014 through February 28, 2015) and management strategies for the second BMAP iteration are included in **Section 4**. **Section 5** describes the activities that occurred in the southern IRL during the reporting period.

Prior to the adoption of the Central IRL BMAP in 2013, extended duration algal super blooms were occurring in the IRL. The blooms resulted in large losses of seagrass acreage, which are reflected in the 2011 seagrass mapping data. The St. Johns River Water Management District (SJRWMD) began the IRL Initiative in spring 2013 in response to the blooms with a series of research and data collection investigations into the potential causes of the blooms. The understanding gained through the Initiative is expected to aid in defining the future direction of the BMAP.

1.2 TOTAL MAXIMUM DAILY LOADS FOR THE CENTRAL IRL BASIN

Due to the large geographical extent of the IRL Basin and the diversity of hydrological characteristics throughout the basin, the Florida Department of Environmental Protection divided the watershed into three subbasins: (1) Central IRL, (2) North IRL, and (3) Banana River Lagoon (BRL). Separate BMAPs were developed for each subbasin; this document focuses solely on the Central IRL subbasin. The main stem of the Central IRL subbasin extends from the Melbourne Causeway in Brevard County to the boundary between Indian River County and St. Lucie County. For assessment purposes, the Department has divided the Central IRL subbasin into water assessment polygons with a unique waterbody identification (WBID) number for each watershed or segment.

In addition to dividing the overall IRL Basin into subbasins, the Central IRL was further divided into “project zones.” The project zone boundaries are based upon the distinct hydrology in different areas of the basin and their corresponding annual residence times. These zones are important because the flushing times vary greatly among locations and consequently affect how nutrient reductions will impact these distinct areas of the basin. The project zones identify large areas where projects should be

implemented to ensure that the load reductions achieve the desired response for each subbasin. The Central IRL subbasin was split into three project zones as follows:

- *Central A – Melbourne Causeway (U.S. 192) to the north tip of Grant Farm Island.*
- *Central SEB – Grant Farm Island to Wabasso Causeway (County Road 510).*
- *Central B – Wabasso Causeway to the boundary between Indian River County and St. Lucie County.*

Figure 1 through **Figure 3** show the stakeholders in each of these project zones.

A portion of the southern IRL extending to the Fort Pierce Inlet and including the drainage areas for the Fort Pierce Farms Canal and C-25 Canal is included in this BMAP. Additional information about this area is included in **Section 5**.

The total nitrogen (TN) and total phosphorus (TP) total maximum daily loads (TMDLs) for the IRL Basin were adopted by the Department in March 2009. The TMDLs focus on the water quality conditions necessary for seagrass re-growth at depth limits that seagrass historically grew in the basin based on a multi-year composite of seagrass coverage. **Table 1** lists the TMDLs and pollutant load allocations adopted by rule for the Central IRL subbasin.

TABLE 1: TMDLS IN THE CENTRAL IRL SUBBASIN

WBID NUMBER	WBID NAME	PARAMETER	TMDL (LBS/YR)	WASTEWATER FACILITIES ALLOCATION (POUNDS PER YEAR [LBS/YR])	STORMWATER ALLOCATION (LBS/YR)	ATMOSPHERIC DEPOSITION ALLOCATION (LBS/YR)
5003D+ 2963A	South Indian River + Indian River Above Sebastian Inlet	TN	684,715	831	577,184	106,700
5003B+ 5003C	South Indian River	TN	278,273	25,391	217,876	35,006
TN Total	Central IRL TN Total	TN	962,988	26,222	795,060	141,706
5003D+ 2963A	South Indian River + Indian River Above Sebastian Inlet	TP	111,594	122	110,187	1,285
5003B+ 5003C	South Indian River	TP	53,599	1,949	50,857	793
TP Total	Central IRL TP Total	TP	165,193	2,071	161,044	2,078

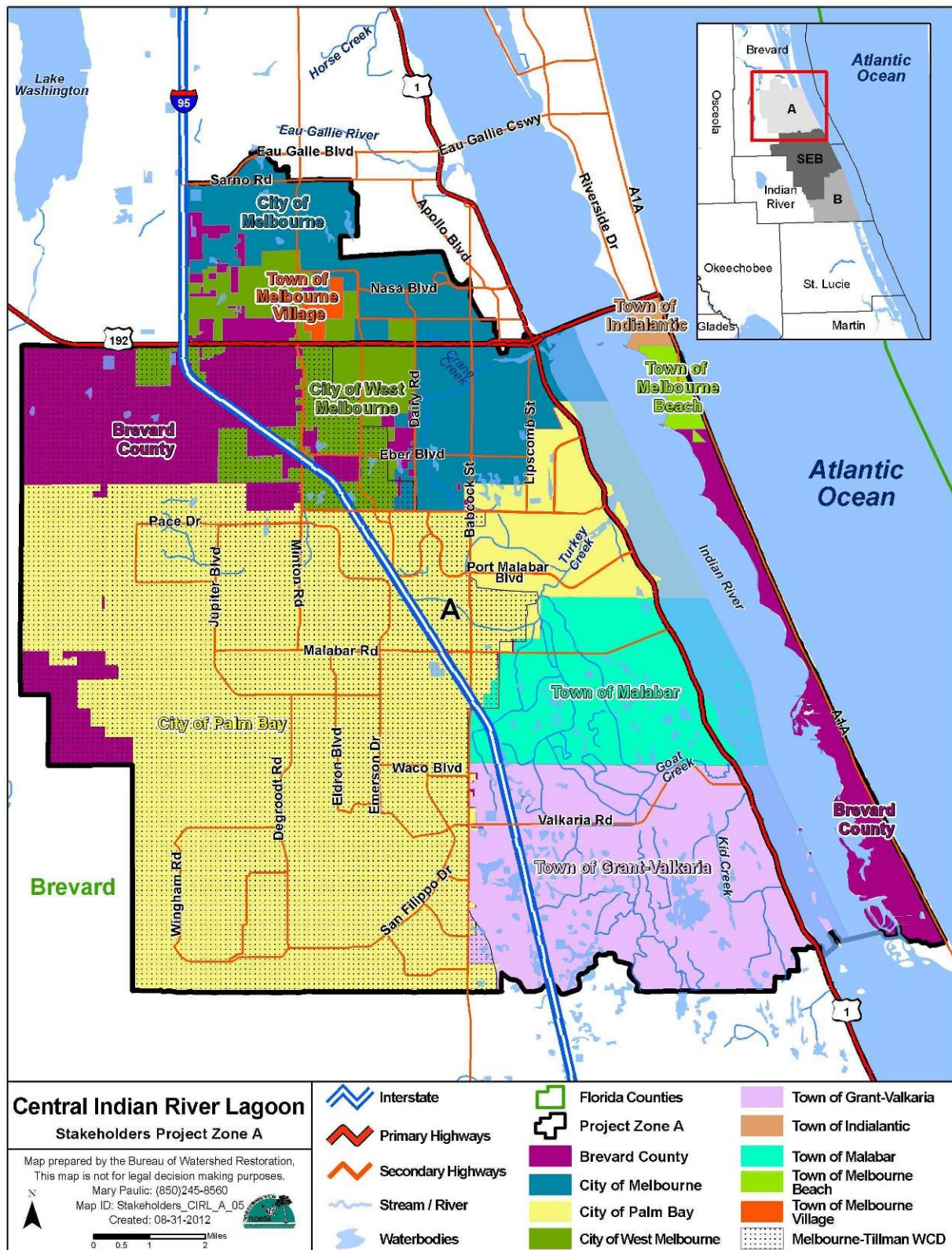


FIGURE 1: ENTITIES IN THE CENTRAL A PROJECT ZONE

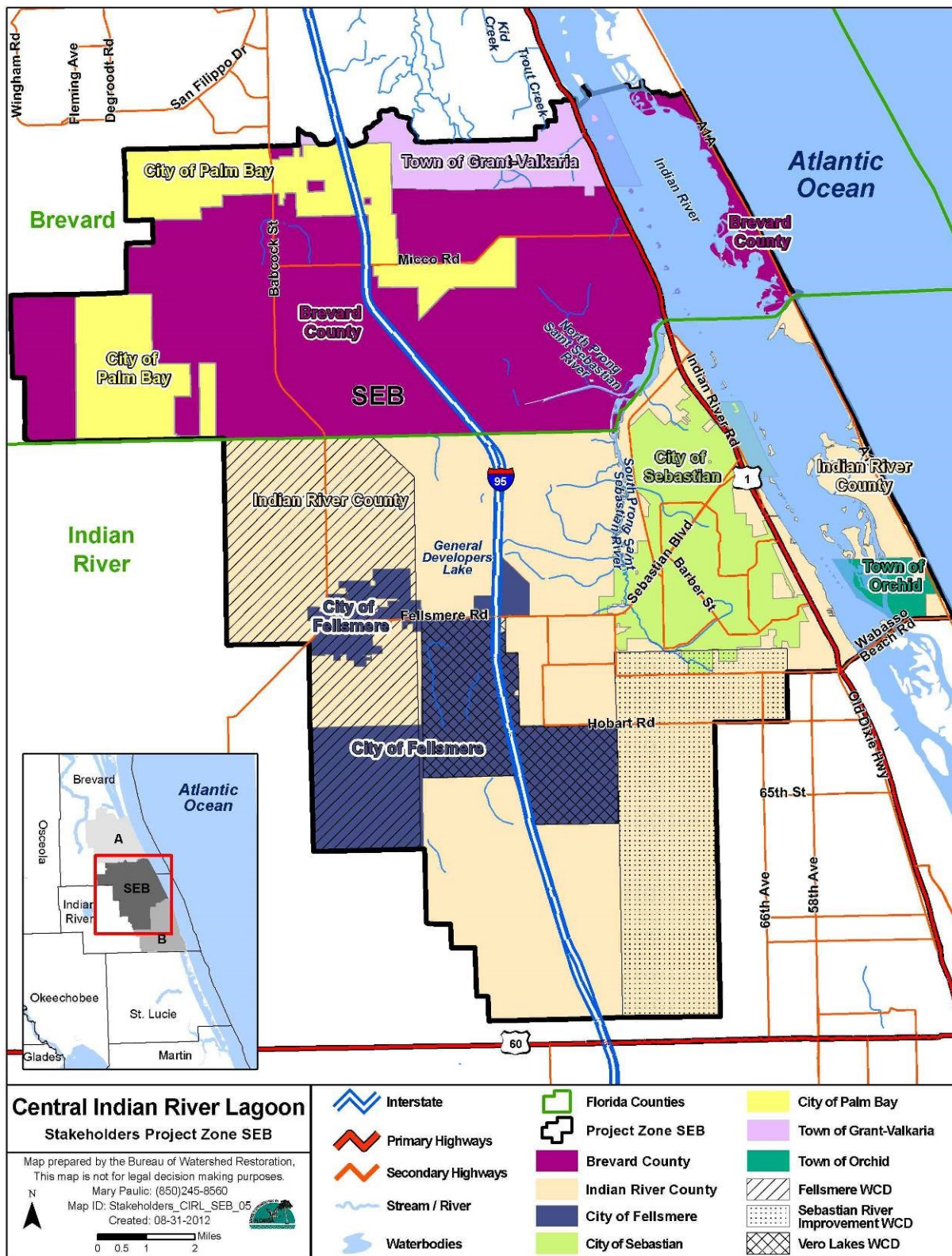


FIGURE 2: ENTITIES IN THE CENTRAL SEB PROJECT ZONE

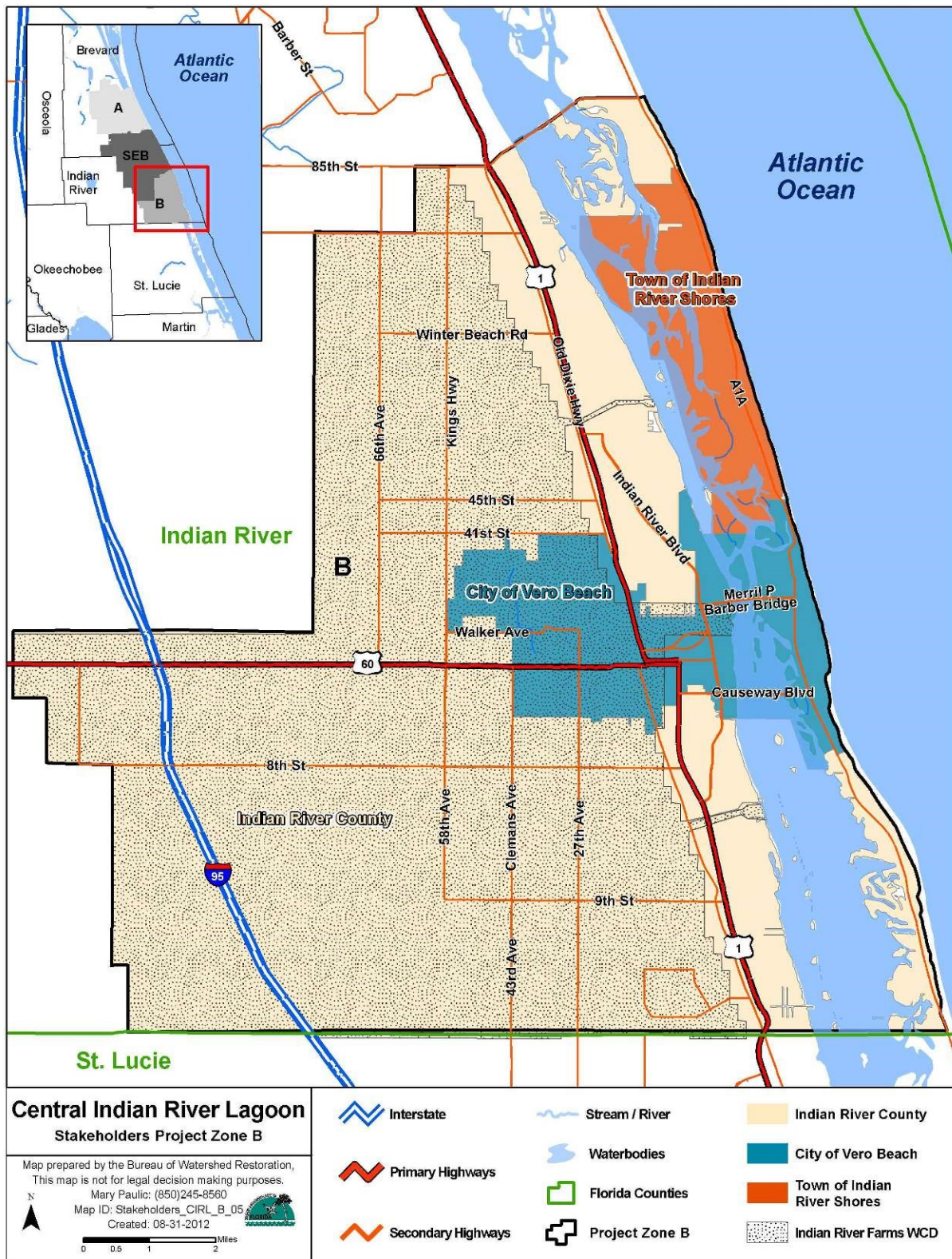


FIGURE 3: ENTITIES IN THE CENTRAL B PROJECT ZONE

1.3 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

The Central IRL BMAP identified municipal separate storm sewer systems (MS4s) and urban nonpoint, and agricultural sources of TN and TP in the basin, as follows:

- *Agriculture.*
- *Brevard County.*
- *Indian River County.*
- *City of Fellsmere.*
- *City of Melbourne.*
- *City of Palm Bay.*
- *City of Sebastian.*
- *City of Vero Beach.*
- *City of West Melbourne.*
- *Town of Grant-Valkaria.*
- *Town of Indialantic.*
- *Town of Indian River Shores.*
- *Town of Malabar.*
- *Town of Melbourne Beach.*
- *Town of Melbourne Village.*
- *Town of Orchid.*
- *Florida Department of Transportation (FDOT) District 4.*
- *FDOT District 5.*
- *Turnpike Enterprise.*
- *Fellsmere Water Control District (WCD).*
- *Indian River Farms WCD.*

- *Melbourne-Tillman WCD.*
- *Sebastian River Improvement District.*
- *Vero Lakes WCD.*

In addition to these entities, the Florida Department of Agriculture and Consumer Services (FDACS), the Department, SJRWMD, and South Florida Water Management District (SFWMD) are essential to the implementation of the BMAP activities.

1.4 BMAP ALLOCATIONS

During BMAP development, the Department conducted the two-step seagrass target evaluation process (refer to **Section 3**) using the 2003, 2005, 2006, 2007, and 2009 mapping years, which were the latest datasets available at the time. In the Central IRL, all three project zones were determined to be both Step 1 and Step 2 compliant. Therefore, additional reductions were not necessary and stakeholders were not assigned allocations at the time of the first BMAP development; however, the stakeholders committed to structural and nonstructural projects to reduce the nonpoint source loading from stormwater. The stakeholders also provided future projects that will help to maintain TMDL compliance.

Section 2: ACCOMPLISHMENTS DURING THE REPORTING PERIOD

During the reporting period, Brevard County completed two projects, the City of Fellsmere completed one project, the City of Sebastian completed one project, FDOT District 4 completed four projects, Indian River County completed three projects, and the Town of Orchid completed one project. For the projects that could be quantified, these projects resulted in an estimated reduction of 14,260 lbs/yr of TN and 3,002.4 lbs/yr of TP.

The accomplishments over the past year are described in **Section 2.1** through **Section 2.6**, and the individual project tables are included in **Appendix A**.

2.1 ACTIVITIES BY ENTITY

2.1.1 BREVARD COUNTY

The county completed construction of Valkaria Lakes (Project BC-7). This project converted three existing borrow pits into a regional stormwater pond system to treat runoff from approximately 524 acres of mostly single family residential lots (see **Figure 4**). The project also reduces private property flooding in some areas. The project is located south of Valkaria Road and east of Interstate-95 on property owned by Brevard County. In 2006, the county applied to the Department for a grant to partially fund the design and construction of the project. Most of the 524 acre drainage area was subsequently incorporated into the new Town of Grant-Valkaria. Through an interlocal agreement with the town, the county managed the grant and implemented construction of the project. The town reimbursed the county for the local match required for the original grant. Following completion of the design and construction phases of this project in March 2012, monitoring to evaluate the effectiveness of the project was required. After construction, the Department requested the monitoring plan be expanded to include evaluation of groundwater interaction with the ponds and offered additional funding. A contract amendment was provided to address the additional monitoring effort. The data obtained will be useful to the Department and local governments in designing and evaluating future projects intended to reduce nutrient loadings.



FIGURE 4: BREVARD COUNTY VALKARIA LAKES PROJECT UNDER CONSTRUCTION

The county completed the Fountainhead Aquatic Vegetation Harvesting (Project BC-14). This project was a pilot project for removing nutrients from a pond and canal by harvesting the dense growth of aquatic weeds. Typically, aquatic weeds at this location are controlled through herbicide use which kills the vegetation in place and leads to decay, release of nutrients, and organic muck build up. This successful pilot project was made possible by partnership with the City of Melbourne and Brevard County Public Works and Solid Waste Departments. The canal connects to two tributaries: the north end connects to a canal that outfalls to the Eau Gallie River that flows into the North B project zone, while the south end connects to a canal that outfalls to Crane Creek that flows into the Central A project zone.

Brevard County has started baffle box retrofits at Corey Road (Project BC-15) and 430 Riverview (Project BC-16) in the Central A project zone. To reduce nutrient loading from organic decay, 17 1st generation baffle boxes located county-wide are currently being retrofitted with nutrient removal screens that separate organic debris from the sediment and hold it up out of the water. The screens trap leaves and grass clippings that release nutrients as they decay.

In addition, the county has started the C-1 Re-diversion (Project BC-17) in conjunction with SJRWMD (refer to **Section 2.2.1** for more detail). This portion of the project pumps 14% of the freshwater flow from the C-1 Canal back toward the St. Johns River by upgrading existing pump stations near the western end of the C-1 Canal. The C-1 Canal was originally constructed to drain natural wetlands for agricultural use and has been maintained for flood protection in the Upper St. Johns River (USJR) Basin. The canal serves a 53,777 acre basin by collecting flow from approximately 300 miles of feeder ditches

and canals. Brevard County has partnered with SJRWMD to fund installation of two, 100 horsepower, 36-inch axial pumps, rated at 50 cubic feet per second, as well as the associated walkway expansions, electrical connections and electrical services required for this upgrade. Pump installation is anticipated to occur in 2014 with grant-required monitoring and outreach continuing for a year thereafter.

Brevard County continued its education efforts (Project BC-5) during the reporting period. Stormwater outreach is a vital component of the county's watershed management program. The county works to engage the community in activities that reduce pollutant loads at the source, as well as projects that remove pollutants that have already entered the lagoon. Programs incorporate hands-on activities like rain barrel workshops, Florida Yard and Neighborhood (FYN) workshops, oyster gardening, as well as interactive presentations with homeowner associations, civic clubs, and school groups. Outreach is conducted by the county's in-house stormwater outreach specialist and through a contracted program, Blue Life. Brevard County leads a Blue Life partnership with nine participating jurisdictions, the Brevard Zoo, and Good Education Solutions. This Blue Life partnership provides messaging across jurisdictions, improves cost effectiveness, and provides a venue for volunteers to assist in this community matter. Outreach conducted county-wide (Central IRL, North IRL, and BRL) during the first year of the BMAP includes six categories:

- *Outreach to Children: 118 presentations to 2,803 children.*
- *Outreach to Adults: 40 presentations to 2,185 people.*
- *Outreach at Special Events: 16 events, 7,167 people.*
- *Florida Stormwater Erosion and Sedimentation Control for the Construction Industry: 3 classes, 124 attendees.*
- *Pollution Prevention Employee Training: 21 training sessions, 421 employees.*
- *Public Engagement Projects: 20 events, 633 volunteers, 1,202 hours.*

The county also continued its street sweeping in the basin (Project BC-22). In year one of the BMAP, county staff reviewed road data sheets to estimate that there are 1,062 miles of county roadway that are constructed with curb and gutter. Street sweeping is currently conducted annually on 386 lane miles, or about 36% of the county's 2,125 miles of curb lanes, at a cost of about \$22,000. Staff has recommended that 100% of curb lanes should be swept eight times annually at an approximate cost of \$250,000. It is

estimated that this increase in street sweeping coverage and frequency would increase nitrogen load reduction from an estimated 7,333 lbs/yr to 83,548 lbs/yr in all three BMAP areas.

2.1.2 INDIAN RIVER COUNTY

Indian River County issued a construction contract for the PC South Algal Nutrient Removal Facility (now called Osprey Marsh) in September 2013 (Project IRC-6). Osprey Marsh is approximately 30% complete. The facility will remove dissolved nitrogen and phosphorus from up to 10 million gallons per day of water from the Indian River Farms WCD's South Relief Canal, and up to 1.5 million gallons per day of brine concentrate from the county's South Reverse Osmosis Water Treatment Facility. The treated water will be discharged back into the Indian River Farms WCD canal system for ultimate discharge into the IRL. Algae will be transported to Egret Marsh Stormwater Park (Project IRC-5) where it will be mixed with Egret Marsh's harvested algae and composted. The compost will be sold locally as Indian River Lagoon Saver™.



FIGURE 5: INDIAN RIVER COUNTY PC SOUTH (OSPREY MARSH) NUTRIENT REMOVAL FACILITY UNDER CONSTRUCTION

In March 2013, the county completed construction of the new concrete algal turf scrubber flowway at Egret Marsh Stormwater Park (Project IRC-5) and the system was placed back into operation. The concrete flowway replaced the original design's faulty and failed grid and membrane system, and this was an approximate \$1.3 million capital cost. The new concrete surface offers more area for attachment

of algae than the prior surface did, and harvesting algae is much easier on the concrete surface. Since the new concrete surface has been placed online, overall removals from the first harvest date (April 4, 2013) through February 20, 2014 are approximately 7,803 pounds TN and 1,517 pounds TP for the algal turf scrubber and harvest water ponds. Overall, the entire system (algal turf scrubber, harvest water ponds, polishing ponds, and wetland system) has removed 15,512 pounds of TN and 3,185 pounds of TP during this time period. Egret Marsh removals are based on estimated weights of harvested algae using laboratory nutrient analysis of representative algal samples together with nutrient removal rates in the harvest water ponds, polishing ponds, and wetland system using data developed during the yearlong Section 319 grant water quality study that was approved by the Department.

In addition, on July 2, 2013, the county entered into a license agreement with VEN Associates to help the county develop and market a compost product made from Egret Marsh's harvested algae. The product will be called Indian River Lagoon Saver™ with the motto "Saving the Lagoon one bag at a time." VEN will research other potential uses for Egret Marsh's harvested algae, and will also research potential uses for the aquatic plants harvested at the county's PC Main Screening System (Project IRC-4) on the Main Relief Canal. In addition, working with VEN, the county has developed a logo for Stormwater Division activities with the motto "Indian River Lagoon Protector." The logo and motto will be placed on items such as tee shirts.

Indian River County also continued its education and outreach activities (Project IRC-8). In 2013, the county passed a fertilizer ordinance that became effective January 1, 2014. In February 2014, Indian River County hired a fulltime stormwater educator and a fertilizer enforcement officer.

2.1.3 CITY OF FELLSMERE

The City of Fellsmere was in the planning stage last year. With funding from various partners, including the IRL National Estuary Program, the city completed a master stormwater and flood control plan for the historical two square mile area of the city center. This plan identified numerous projects to assist in the reduction of loadings into the IRL and mitigate flood risks. The city is now seeking funding partners to implement the identified projects.

2.1.4 CITY OF PALM BAY

The City of Palm Bay continued its street sweeping (Project PB-16) in the basin, collecting 64.93 tons of material during the reporting period. The city also continued its education efforts (Project PB-27) (see

Figure 6). In addition, the city replaced the culvert pipes in the Port Malabar Unit 1 Central area to perforated pipes for exfiltration (see **Figure 7**). This project allows for retention of stormwater runoff by capturing and percolating the runoff back into the soils.



FIGURE 6: CITY OF PALM BAY EDUCATION AND OUTREACH EFFORTS



FIGURE 7: CITY OF PALM BAY PORT MALABAR UNIT 1 CHANGE IN PIPES

2.1.5 CITY OF SEBASTIAN

The City of Sebastian continued its education and outreach efforts in the basin (Project SEB-10). The city also completed the Powerline Road baffle box (Project SEB-13). The city has continued to see success with the Periwinkle wet detention pond (Project SEB-7).

2.1.6 CITY OF VERO BEACH

The city passed a fertilizer ordinance in November of 2013 (Project VB-4). This ordinance aligns itself with an ordinance passed by Indian River County, and replaced a previous, less stringent ordinance. The alignment with the county ordinance will also make it easier for residents and businesses in the city

to follow the ordinance. The ordinance requires the use of slow release nitrogen, bans phosphorus and imposes a four month black out period of fertilizer use during the rainy season. Public education and civic responsibility are challenging aspects of reducing nonpoint source pollution. The fertilizer ordinance gives the city a valuable tool to use in meeting those challenges, and that is why it is a success story for the City of Vero Beach. In addition, the city completed the installation of the 18th Street outfall type II baffle box, which was partially funded by a Section 319 grant (see **Figure 8**). This outfall serves an area of approximately 148 acres of mixed use development.



FIGURE 8: CITY OF VERO BEACH 18TH STREET OUTFALL IMPROVEMENT PROJECT

2.1.7 CITY OF WEST MELBOURNE

The City of West Melbourne continued its street sweeping (Project WM-21) in the basin collecting 228.5 tons of material, and inlet cleaning (Project WM-22) in the basin collecting 3,495 pounds of material. The city also had appraisals performed on several properties with the intent of using some or all of them for stormwater treatment ponds.

2.1.8 TOWN OF INDIALANTIC

The Town of Indialantic has continued its education and outreach efforts (Project TI-1), and found that fewer uneducated violations are occurring. Outreach occurs through articles published in the town's

monthly newsletter that is sent to all residents. Pamphlets are also available and are on display at town hall. The town has also continued swale construction for water quality retention (Project TI-2). Swales are first installed in areas that over-inundate inlets, resulting in swales that provide “first flush” retention for initial stormwater runoff. The town also continued to clean about 20 drainage inlets (Project TI-3) and sweep all curbed streets quarterly (Project TI-4).

2.1.9 TOWN OF ORCHID

The Town of Orchid continued with its education and outreach efforts (TO-1) during the reporting period.

2.1.10 FDOT DISTRICT 4

FDOT District 4 continued its street sweeping (Project FDOT4-4) and education efforts (FDOT4-9) in the basin during the reporting period. FDOT District 4 also provided information on four projects that had been previously completed in the Central IRL, which were missing from the BMAP.

2.1.11 FDOT DISTRICT 5

FDOT District 5 continues to implement its illicit discharge and stormwater education programs (FDOT5-14) during the reporting period.

2.1.12 TURNPIKE AUTHORITY

Florida’s Turnpike has continued with the mechanical sweeping program previously reported (Project T-1). The mechanical sweeping contracts have been revised to obtain a more accurate number for nutrient removal via the “field volume formula.”

2.1.13 FELLSMERE WCD

The Fellsmere WCD continued its mechanical canal maintenance (FWCD-6) during the reporting period. The WCD also helped to fund the City of Fellsmere’s historic Fellsmere master drainage plan, which includes regional treatment lakes (Project FWCD-7).

2.1.14 INDIAN RIVER FARMS WCD

Indian River Farms WCD continued the mechanical removal of floating vegetation from its canals (Project IRF-2). In 2013, the district removed 3,656 tons of vegetation. The material is placed on the bank to biodegrade, and the berms are sloped away from the top of bank so the nutrients do not reenter the canal.

2.1.15 SEBASTIAN RIVER IMPROVEMENT DISTRICT

The Sebastian River Improvement District has established a two-inch discharge rule, which is applied to any planned projects that are within the authorization of the district (Project SRID 1). The district has a scope-of-work underway for structural analysis and repairs of the radial arm control gates, and the district is still envisioning updating these gates (Project SRID-2). The district has continued its annual shoal/sediment removal, and the berm restoration and vegetation removal from the main and sub-lateral canals (Project SRID-3). The Sebastian River Improvement District does not use herbicide spraying; all vegetation removal is mechanical. The district had discussions during the reporting period with Indian River County, SJRWMD, and local special districts about the potential utilization of abandoned lands within the Sebastian River Improvement District for attenuation and alternative water supply project siting (Project SRID-5). The Sebastian River Improvement District Board provided endorsement and staff have been holding discussions with Indian River County, SJRWMD, and the Department regarding expansion of the dispersed water storage/water farming projects onto Sebastian River Improvement District (Project SRID-6). The district is also utilizing a developed basin model for jurisdictional waters west of Lateral D (more than 10,000 acres), in conjunction with developing a resolution for better management of stormwater entering the Lateral D system, which is connected directly to the IRL (Project SRID-7).

2.1.16 AGRICULTURE

FDACS currently has two field staff and two contracted staff in SJRWMD, working in more than a dozen basins with adopted BMAPs. There have been few new enrollments in best management practices (BMPs) in the Central IRL subbasin since BMAP adoption, due to the loss of a contracted employee who was covering the area. FDACS will be looking into providing additional staff coverage for the area. Additionally, **Table 2** shows a loss of enrolled citrus acreage from what was included in the BMAP due to the removal of out of production groves.

TABLE 2: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE CENTRAL IRL

N/A = Not applicable

¹ FDACS staff-adjusted acreage for purposes of enrollment is based on a review of more recent aerial imagery in the basin and local staff observations.

² FDACS staff have observed no active poultry operations in the BMAP area, but will confirm this.

2000 SJRWMD LAND USE	2000 ACRES	FDACS ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIs
Pasture	27,410.2	24,691.9	Cow/Calf; Future (hay)	696.7	3
Row/Field/Mixed Crops	724.7	515.5	Vegetable/Agronomic Crops	62.6	1
Fallow Cropland	2,429.4	N/A	No enrollment needed	N/A	N/A

2000 SJRWMD LAND USE	2000 ACRES	FDACS ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIS
Horse Farm ²	62.7	57.9	Equine	0.0	N/A
Citrus	43,747.7	17,910.3	Ridge Citrus; Flatwoods Citrus	7,647.7	88
Abandoned Citrus	1,153.0	N/A	No enrollment needed	N/A	N/A
Tree Crops	5.3	0.0	Specialty Fruit & Nut	1.0	1
Nurseries and Vineyards	2.9	2.9	Future Nursery	N/A	N/A
Ornamentals	238.8	200.9	Container Nursery	215.7	13
Specialty Farms	93.4	81.0	Conservation Plan Rule	0.0	N/A
Cattle Feeding	4.5	4.5	Conservation Plan Rule	0.0	N/A
Other Open Lands – Rural	94.2	N/A	No enrollment needed	N/A	N/A
Total	75,966.8	43,464.9	N/A	8,623.7	106
5-Year Enrollment Goal (50%)	N/A	21,732.5	N/A	N/A	N/A
Acreage Enrolled as of December 2013	N/A	8,623.7	N/A	N/A	N/A
Remaining Acres to Enroll	N/A	13,108.8	N/A	N/A	N/A

2.2 REGIONAL PROJECTS

2.2.1 C-1 RE-DIVERSION PROJECT

The Central IRL is largely affected by the C-1 canal, which is part of the Melbourne-Tillman WCD. The purpose of this canal is to provide flood protection to approximately 80,000 people in a 98 square mile area, encompassing a large portion of Palm Bay and West Melbourne. However, discharges from the C-1 are responsible for up to 80% of Turkey Creek’s annual loading of nutrients to the Central IRL, which affects the lagoon’s water quality, adds to the muck deposition in both the lagoon and Turkey Creek, and limits seagrass coverage along a 10 to 20 mile portion of the lagoon. Large discharges from C-1 have also caused dramatic declines in salinity, which affects the lagoon’s ecosystem. To address these issues, the SJRWMD and Melbourne-Tillman WCD are implementing the C-1 re-diversion project.

The first phase of the re-diversion project was completed in 2011, and re-diverts runoff from the Melbourne-Tillman WCD that currently drains to the IRL back into the USJR Basin, which is how the water historically drained. Phase 1 of the project consisted of replacing the MS-1 structure gates on the C-1, creating the C-1 Retention Area to store stormwater runoff, and creating the Sawgrass Lake Water Management Area to receive pumped discharge from the Melbourne-Tillman WCD canals so that the water can be treated before it is released to the USJR Basin. The first phase of the project is estimated to reduce annual discharge volume by 28%. The expected reductions from the first phase of the project are 92,860 lbs/yr of TN and 10,847 lbs/yr of TP. In an effort to improve the westward flow of water to the pumps at the Sawgrass Lakes Water Management Area, the hydraulics in the most western 1.5 miles of

the C-1 canal are being evaluated, with required improvements to be implemented in the future. In addition, the partners in the project are developing a plan to manage the sediment that no longer reaches the lagoon due to the operation of Phase 1. By early winter 2014, upgraded pumps at the Sawgrass Lakes Water Management Area will increase pumping capacity by approximately 100 cubic feet per second, which will support the westward diversion of more water.

A second phase of the project is proposed, which includes the creation of the C-10 Retention Area. The C-10 Retention Area will receive pumped discharge from the Melbourne-Tillman WCD canals for treatment before the water is released to the Three Forks Marsh Conservation Area. There are five design alternatives for Phase 2 under evaluation. The completion of a preliminary design for the C-10 Retention Area is currently scheduled for fall 2014, which will lead to preparation of a final design and permitting. Current plans call for two years of construction beginning in 2015 and ending in 2017.

With both phases of the C-1 re-diversion project in place, there would be an estimated reduction in average annual discharge volume of 41% - 46%. This equates to a 54% - 59% reduction in the current annual loading. The current C-1 basin loads, based on 2000 land uses, are estimated to be 331,644 lbs/yr of TN and 38,739 lbs/yr of TP. Therefore, the expected reductions from both phases of the re-diversion project are 179,088 - 195,670 lbs/yr of TN and 20,919 - 22,856 lbs/yr of TP.

2.2.2 USJR PROJECT AND C-54

In the 1950s, the U.S. Army Corps of Engineers began planning a flood control project in the USJR Basin. The original project involved a series of flood storage reservoirs and a network of canals to divert excess floodwaters from the USJR to the IRL. Portions of this flood control project, including C-54, were constructed by 1973, when construction was stopped by President Richard Nixon because of an Environmental Impact Statement, which found that the project had unacceptable impacts on the environment. One of these environmental impacts was the harm that freshwater diversion caused to the IRL.

C-54 is located along the Brevard County and Indian River County line and was originally designed to divert up to 6,000 cubic feet per second of water from the St. Johns River to the IRL through the Sebastian River. Environmental studies found that this diversion of freshwater would significantly reduce the population of shellfish in the IRL and would cause swings in the salinity of the lagoon, impacting other fish and wildlife resources. In 1977, the SJRWMD took over the project area and

designed a plan with the U.S. Army Corps of Engineers to revitalize the St. Johns River's flow by reclaiming drained marshlands, plugging canals and building reservoirs. As part of this project, C-54 is no longer directly connected to the St. Johns River. The components of the USJR project that reduced discharges through the C-54 to the IRL were completed by 1996. The C-54 now only serves as an emergency overflow for the St. Johns Water Management Area to ensure that extreme flood events do not overtop the flood protection levees. However, discussions on the C-54 operations are ongoing and flows through the canal could be changed in the future. Since 1996, discharges through C-54 have only occurred during 3 major storm events: (1) unidentified storm in 1999, (2) hurricanes in 2004, and (3) Tropical Storm Fay in 2008.

SJRWMD is currently working on the Fellsmere Water Management area, which is located adjacent to the USJR Basin project and will provide the ability to reconnect large areas of the floodplain in this area. One of the anticipated benefits of the project is that the frequency of discharges through the C-54 to the IRL will decrease to less than a 1-in-100 year storm event. The IRL seagrass beds should benefit from decreases in inter-basin discharge of agricultural stormwater runoff from the farming areas in the USJR into the adjacent coastal lagoon system. The Fellsmere Water Management Area should be completed in 2015, and this work is approximately 95% complete and on schedule.

2.3 SUMMARY OF ACCOMPLISHMENTS

The projects completed during the first annual BMAP reporting period are summarized in **Table 3**. For the projects that could be quantified, these projects resulted in an estimated reduction of 14,260 lbs/yr of TN and 3,002.4 lbs/yr of TP. These reductions are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 40,906.3 lbs/yr of TN and 10,179.7 lbs/yr of TP.

TABLE 3: SUMMARY OF PROJECTS COMPLETED IN THE REPORTING PERIOD (FEBRUARY 7, 2013 THROUGH FEBRUARY 28, 2014) IN THE CENTRAL IRL

ENTITY	PROJECT ZONE	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
Brevard County	Central A	BC-7	Valkaria Lakes	700	166.1
Brevard County	Central A	BC-14	Fountainhead Aquatic Vegetation Harvesting	489	79.1
City of Fellsmere	Central SEB	F-8	Fertilizer Ordinance	Not quantified	Not quantified
City of Sebastian	Central SEB	SEB-13	Powerline Road Baffle Box	Not quantified	Not quantified
FDOT D4	Central SEB	FDOT4-22	FM# 411476-1 (Sebastian River Bridge Replacement)	Not quantified	Not quantified

ENTITY	PROJECT ZONE	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FDOT D4	Central B	FDOT4-18	FM# 228583-3 (SR 5/US-1)	Not quantified	Not quantified
FDOT D4	Central B	FDOT4-19	FM#: 230873-1 (27th Avenue Reconstruction)	Not quantified	Not quantified
FDOT D4	Central B	FDOT4-20	FM#: 229966-1 (SR A-1-A at the Moorings)	Not quantified	Not quantified
Indian River County	Central SEB	IRC-8	Education – addition of fertilizer ordinance	Not quantified	Not quantified
Indian River County	Central B	IRC-5	Egret Marsh Stormwater Park – additional reductions from upgrade	13,018	2,639
Indian River County	Central B	IRC-8	Education – addition of fertilizer ordinance	Not quantified	Not quantified
Town of Indialantic	Central A	TI-3	Drainage Inlet Cleaning	25	100
Town of Indialantic	Central A	TI-4	Street Sweeping	28	18.2
Town of Orchid	Central SEB	TO-1	Education – addition of fertilizer ordinance	Not quantified	Not quantified
Total	N/A	N/A	Total Reductions in Reporting Period	14,260	3,002.4

2.4 FUNDING

Brevard County received an \$117,000 Section 319 grant for its county-wide (Central IRL, North IRL, and BRL) baffle box retrofit projects. The county also received Section 319 grants for Valkaria Lakes (Project BC-7) (\$144,000); Micco I Water Quality Improvements (Project BC-9), which is currently being amended to include a denitrification wall(\$340,375), and Wheeler Fleming Grant (Project C-13) (\$380,593). In addition, the county received a \$260,215 TMDL grant for the C-1 Re-diversion (Project BC-17).

Indian River County received the three grants for the PC South (Osprey Marsh) (Project IRC-6): (1) a Section 319 grant from the Department, (2) a TMDL grant from the Department, and (3) a SJRWMD cost-share grant.

The City of Sebastian received a Section 319 for \$186,000 for its drainage improvement projects, and a TMDL grant for \$90,000 for the Presidential streets projects (Project SEB-12).

The City of Vero Beach obtained a Section 319 grant in the amount of \$100,000 for the 18th Street type II baffle box project. The total project cost is estimated at \$164,000.

2.5 FERTILIZER ORDINANCES

Local governments located within the watershed of a waterbody or water segment that is listed as impaired by nutrients are required to adopt, at a minimum, the Department’s Model Ordinance for Florida-Friendly Fertilizer Use on Urban Landscapes (Section 403.067, F.S.). A status of ordinance development over the past year is summarized in **Table 4**.

TABLE 4: SUMMARY OF FERTILIZER ORDINANCE DEVELOPMENT DURING THE REPORTING PERIOD IN THE CENTRAL IRL

LOCAL GOVERNMENT	FERTILIZER ORDINANCE STATUS
Brevard County	Adopted
Indian River County	Adopted
City of Fellsmere	Adopted
City of Palm Bay	Draft
City of Sebastian	Adopted
City of Vero Beach	Adopted
City of West Melbourne	In discussion
Town of Indialantic	Scheduled for adoption in April 2014
Town of Orchid	Adopted

2.6 WATER QUALITY AND SEAGRASS MONITORING

Indian River Farms WCD continued to monitor its three quarterly water quality stations in the basin. Sebastian River Improvement District continued sampling its one quarterly water quality station in the basin and the data are shown in **Appendix B**. SJRWMD continued its monthly sampling of 19 water quality stations in the Central IRL, and added sampling at two new monthly stations for the BMAP. SJRWMD also continued its seagrass transect monitoring in the Central IRL, and this monitoring collects data about the seagrass, phytoplankton, epiphyte coverage, and water quality along each transect. In addition, the Department and SJRWMD worked with Dewberry, a consulting firm, to fly the aerial photography for the seagrass imagery analysis in April and May 2013. The mapped seagrass deep edge from the aerial imagery should be available by late summer or early fall 2014. Completion of the actual mapping process is expected by early summer, and the draft results will then undergo a quality assurance review and correction, as needed.

Section 3: SEAGRASS DEPTH LIMIT TARGET EVALUATION

The goal of the TMDLs is to recover the deeper seagrass habitats, with the biological response of the seagrass being the most important factor in evaluating the success of achieving the TMDL targets. To assess progress for the IRL Basin towards the median seagrass depth limit target, a two-step process is used.

Step 1 in this process is a cumulative frequency distribution analysis. The four most recent mapped seagrass datasets from SJRWMD are used to create a union coverage of the assessment years in Geographic Information System (GIS). Using this union coverage, a 15.8-meter buffer zone is applied to the perimeter of the coverage to establish the deep edge of the seagrass beds. This buffer coverage shows the deepest edge that seagrass grew at any time within the data period, and is used to create a cumulative frequency distribution curve of the depth at which seagrass exist within each project zone in the IRL Basin. This curve is then compared to the union coverage TMDL depth limit target curve. Compliance in Step 1 is achieved when at least 50% or more of the assessment years' frequency distribution curve (including its 50th percentile value) lies on or to the right of the TMDL depth limit target curve.

Step 2 is conducted by calculating the median seagrass depth for each year of the four most recent datasets. Each assessment year median is then compared to the TMDL median depth limit target. Three of the four assessment years' medians must meet or exceed the median TMDL to be Step 2 compliant. If the project zone is both Step 1 and Step 2 compliant, it is considered to be meeting the TMDL seagrass depth limit target. If the basin fails to meet either Step 1 or Step 2, it is not considered to be meeting the TMDL seagrass depth limit target for that set of assessment years.

The Department conducted this two-step evaluation process using the 2006, 2007, 2009, and 2011 mapping years, which were the latest datasets available at the time of this analysis. For the Central IRL project zones, all three project zones were determined to be both Step 1 (**Figure 9** through **Figure 11**) and Step 2 compliant (**Table 5**).

Between 2009 and 2011, the median depth for the Central A project zone decreased by 27%, the median for the Central SEB project zone decreased by 30%, and the median for the Central B project zone decreased by 22%. With the continuing problems in the lagoon, it is anticipated that the 2013 median

seagrass depths will also be less than the TMDL targets. Finalized data from 2013 seagrass maps is expected by late summer or early fall 2014, and draft data could be available earlier in the summer. Two mapping years of failure to meet the median depth targets will result in the allocation of loading reductions to local stakeholders. The Department may consider other metrics of seagrass health to better identify negative trends and facilitate response.

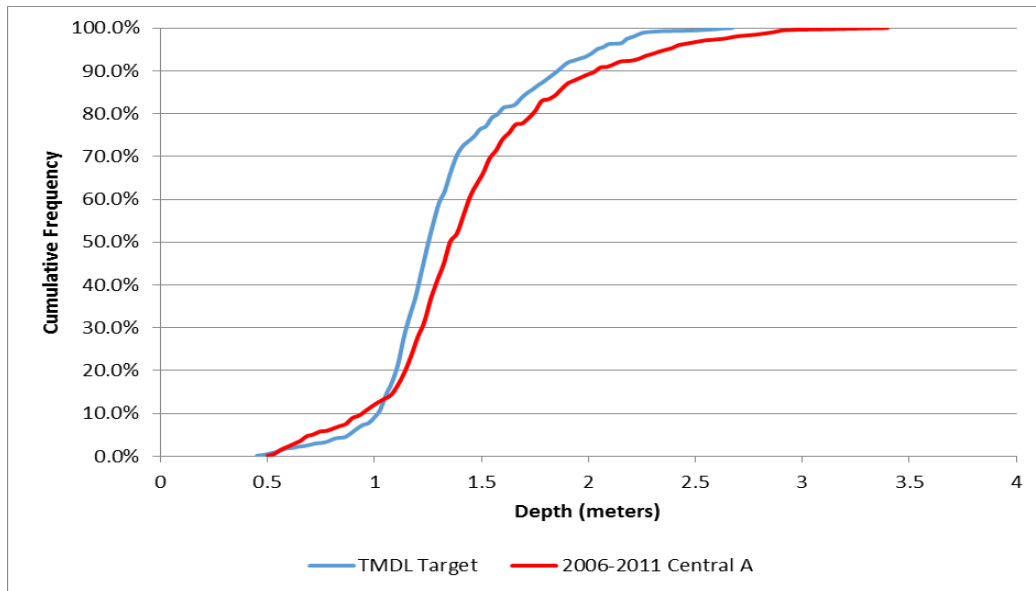


FIGURE 9: STEP 1 COMPLIANCE EVALUATION FOR THE CENTRAL A PROJECT ZONE FOR 2006-2011

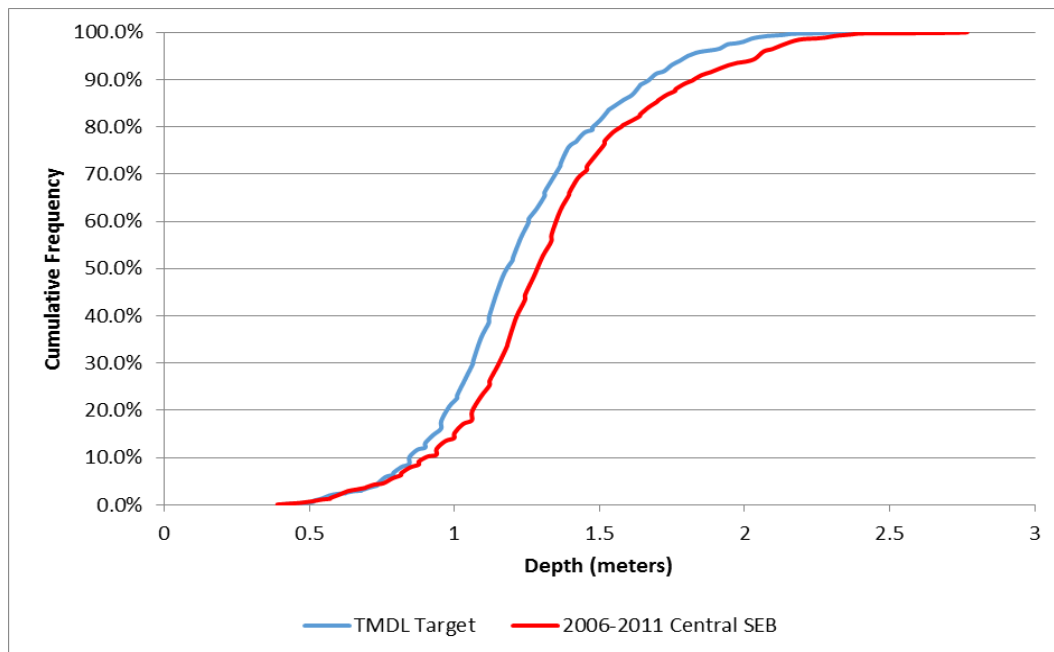


FIGURE 10: STEP 1 COMPLIANCE EVALUATION FOR THE CENTRAL SEB PROJECT ZONE FOR 2006-2011

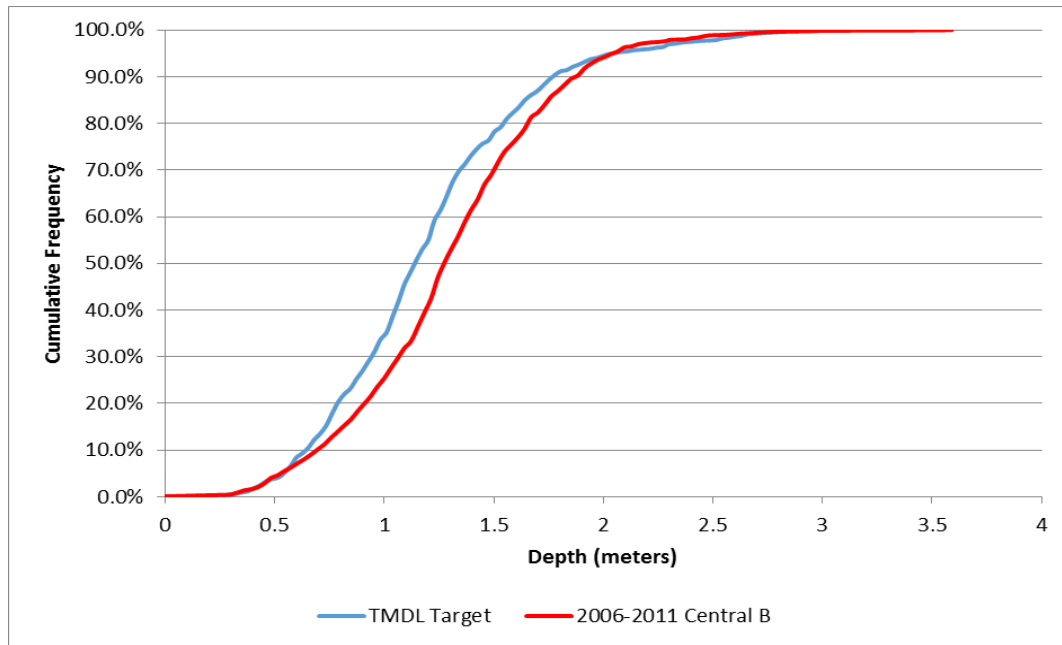


FIGURE 11: STEP 1 COMPLIANCE EVALUATION FOR THE CENTRAL B PROJECT ZONE FOR 2006-2011

TABLE 5: STEP 2 COMPLIANCE EVALUATION FOR THE CENTRAL IRL SUBBASIN

* Grey highlighting indicate years that the TMDL median depth limit target was achieved in the project zone.

YEAR	CENTRAL A MEDIAN DEPTH (METERS)	CENTRAL SEB MEDIAN DEPTH (METERS)	CENTRAL B MEDIAN DEPTH (METERS)
TMDL Median	1.27	1.20	1.15
2006	1.29*	1.24*	1.21*
2007	1.39*	1.27*	1.27*
2009	1.32*	1.27*	1.24*
2011	0.96	0.89	0.97
Step 2 Compliant?	Yes	Yes	Yes

Section 4: UPCOMING ACTIVITIES

4.1 ACTIVITIES IN THE UPCOMING REPORTING PERIOD

The second annual progress report will encompass the period of March 1, 2014 through February 28, 2015. The activities that will occur during this time are summarized in **Section 4.1.1** through **Section 4.1.5**.

4.1.1 *BREVARD COUNTY*

In 2014, Brevard County will complete Micco I exfiltration/denitrification (Project BC-9), Corey Road at Hall baffle box retrofit (Project BC-15), and 430 Riverview baffle box retrofit (Project BC-16).

4.1.2 *FDOT DISTRICT 4*

FDOT District 4 is scheduled to complete the retention project along Interstate-95 from the St. Lucie/Indian River County line to north of State Road 60 in October 2014.

4.1.3 *SEBASTIAN RIVER IMPROVEMENT DISTRICT*

The Sebastian River Improvement District has an education section on its website that is planned for release in summer 2014 (Project SRID-4).

4.1.4 *AGRICULTURE*

FDACS will be looking into providing additional staff coverage for the Central IRL subbasin to increase agricultural enrollment in BMPs.

4.1.5 *WATER QUALITY AND SEAGRASS MONITORING*

Indian River Farms WCD will continue to monitor its three water quality stations in the basin, and the Sebastian River Improvement District will continue to sample its one water quality station in the basin. SJRWMD will continue to monitor its 21 water quality stations, and continue the seagrass transect monitoring in the basin. The Department and SJRWMD will continue to work with the aerial photography contractor Dewberry on the evaluation of the 2013 seagrass aerial imagery so that the seagrass target evaluation can be updated with the latest data.

4.2 MANAGEMENT STRATEGIES FOR THE SECOND BMAP ITERATION

The Central IRL BMAP stakeholders have already begun planning management strategies to achieve additional TN and TP reductions for the second BMAP iteration. The strategies identified to date are summarized in **Section 4.2.1** through **Section 4.2.11**. It is important to note that the activities listed below are not BMAP requirements at this time, but are listed to show that plans are underway to achieve additional nutrient reductions to benefit the Central IRL.

Cost share funds for projects that reduce nutrient loading are available from the Department through the Section 319 and TMDL Restoration Grant Programs. The Department announces the availability of these funds to stakeholders, and encourages local governments to use these programs to fund BMAP projects.

4.2.1 BREVARD COUNTY

The following types of projects represent traditional BMPs that Brevard County would like to increase in the near future, pending Brevard County Board of County Commissioners' approval of additional funds:

- *Increased street sweeping.*
- *Increased sediment device cleaning and maintenance frequency.*

The following types of projects receive a designated percentage of provisional BMAP credit; however, Brevard County believes that exceeding the minimum standards for these BMPs will be more effective, timely, affordable, and efficient in the IRL watershed than other traditional BMPs. Therefore, Brevard County would like to invest in expanding these programs:

- *Expanded public outreach (Blue Life, Be Floridian, public service announcements [PSAs], social media, etc.).*
- *FYN Program translated locally as a mobile My Brevard Yard Program.*

The following types of projects represent non-traditional opportunities Brevard County would like to explore for the IRL. Meeting the BMAP allocations and TMDLs may be achieved faster if the Department approves a wider variety of projects for BMAP credit. In addition, the amount of credits allocated for projects could be adjusted to remove economic disincentives for non-traditional

approaches. This will provide greater flexibility for stakeholders to pursue projects that could prove to be more effective, affordable, and efficient in the IRL watershed, such as:

- *Denitrification walls and liners.*
- *Open channel baseflow denitrification.*
- *Phosphorus binding media integration into treatment trains.*
- *Living shorelines using littoral vegetation and oyster reefs.*
- *Shellfish and filter feeder population enhancement in the IRL (not just along the shoreline).*
- *Legacy load removal (muck dredging).*
- *Legacy load removal (strategic drift algae harvesting).*
- *Legacy load management and habitat restoration (capping muck deposits with clean fill at appropriate grade to provide seagrass substrate or marsh habitat).*
- *Seagrass planting and/or transplanting in carefully selected refugia/restoration epicenters.*
- *Aquatic plant harvesting from lakes, ponds canals, ditches, etc. (such as the Fountainhead Aquatic Vegetation Harvesting Pilot Project in the North IRL Basin).*
- *Plugging abandoned, free-flowing artesian wells.*
- *Increased nutrient removal at the source of irrigation reuse water.*
- *Bioswales and other green infrastructure.*
- *Elimination of septic tanks or upgrades to advanced treatment systems.*
- *Code changes to encourage more low impact development (decreased imperviousness, swales and rain gardens, cisterns, etc.).*
- *Land development incentives to increase the use of stormwater ponds for irrigation.*
- *Economic incentives for modifying exiting private stormwater infrastructure to improve its effectiveness.*

4.2.2 INDIAN RIVER COUNTY

Indian River County is considering cleaning out the old sediment trap at the mouth of the Main Relief Canal that is full of sediment.

4.2.3 CITY OF FELLSMERE

The City of Fellsmere is considering several future projects. The North Regional Lake project will be a five-acre lake/wetland system to address untreated stormwater from the historical commercial lots along North Broadway, the city's commercial core. The South Regional Lake project will be a 40-acre wetland system to address untreated stormwater from the southeast residential areas of the city and develop treatment credits for other areas untreated areas. The Stormwater Greenway project would be a linear wetland systems in place of existing conveyance ditches to provide treatment and storage credits for untreated areas.

4.2.4 CITY OF PALM BAY

The City of Palm Bay staff is in the process of procuring 18 inlet baskets for the Port Malabar Unit 1 area to include Port Malabar Boulevard and Florin Avenue. Staff is also seeking funding for construction of a wet detention system in the Basin 3 watershed on a four-acre site currently under ownership of the city. Also, plans are being prepared for the modification of a wet detention system for a pond at the end of Florin Avenue to increase the treatment volume, and expansion of a dry detention system within the Basin 2 watershed along Kingswood Drive to reduce flooding and attenuate volume for controlled releases.

4.2.5 CITY OF SEBASTIAN

The City of Sebastian passed a new National Pollutant Discharge Elimination System (NPDES) ordinance with stricter requirements.

4.2.6 CITY OF VERO BEACH

The City of Vero Beach is getting ready to implement a new initiative, as a pilot project, for the installation of porous pavement media at stormwater inlets to trap floatables in such a way that they can be collected via routine street sweeping activities, rather than the much more expensive process using the city's vac-con truck to clean stormwater structures. The city believes this method will be more effective than current type II baffle box technology at keeping organic debris and the resulting nutrient loads out of stormwater, while at the same time being easier and less expensive to both install and

maintain. Additionally, the porous pavement media proposed has been shown to reduce dissolved nitrogen loads in stormwater runoff by up to 80% via uptake and conversion to gaseous nitrogen by virtue of the bio-film which develops within the porous pavement media.

The city is also independently evaluating the efficiency of permanent, continuously harvested, floating vegetative mats for the reduction of dissolved nitrogen and phosphorus in the major stormwater outfalls. Previous studies have concentrated on the cost of harvesting the vegetative mats versus the nutrients contained within the harvested material. Such studies have indicated that this methodology has the lowest cost per pound of nutrient removed of any of the other standard BMPs. However, very little research has been done to determine what the actual nutrient removal rates could be for permanent, continuously harvested, vegetative mat installations in stormwater outfalls.

4.2.7 *CITY OF WEST MELBOURNE*

The City of West Melbourne is exploring the possibility of building a stormwater treatment pond(s). Appraisals have been performed on several potential sites.

4.2.8 *TOWN OF INDIALANTIC*

The Town of Indialantic has completed preliminary design on three projects. These projects exceed available funding and are currently not being pursued to final design and construction phases. The Riverside Drive at 2nd Avenue project is a dry detention treatment area that will intercept the existing storm sewer to divert initial runoff. This project also includes a bubble up structure and weir structure. The estimated project cost is \$85,000. The second proposed project will add retention swales along Orlando Boulevard. The project also includes catch basin replacement design for water quality enhancement, replacement of the collapsing storm sewer that feeds sediments to the IRL, and installation of an outfall box/sedimentation/skimmer/trash collector. The estimated project cost is \$2.1 million. In addition, the city has finalized the preliminary design to add stormwater treatment along 6th to 9th Avenues at an estimated cost of \$91,000.

4.2.9 *FDOT DISTRICT 4*

FDOT District 4 has provided Indian River County information about FDOT outfalls, and this could possibly lead to a joint project.

4.2.10 FDOT DISTRICT 5

FDOT District 5 has identified projects on the approved five-year work program. These projects were provided on the initial project inventory list for the BMAP.

4.2.11 SEBASTIAN RIVER IMPROVEMENT DISTRICT

The Sebastian River Improvement District is considering governing resolutions regarding stormwater runoff, and adding regional attenuation/water farming projects.

4.3 PATH FORWARD

Local BMAP stakeholders are continuing the design and implementation of projects that will reduce nutrient loading into the Central IRL and planning for the second cycle of the BMAP (**Section 4.1** and **Section 4.2**). In addition, stakeholders have identified opportunities to revise the BMAP. Many of these matters were identified in Chapter 1 of the adopted Central IRL BMAP. During year two of the BMAP, the Department will work with stakeholders to identify opportunities to try new technologies or innovative approaches to prevent nutrient loading, including consideration of appropriate credit for such actions. Additionally, the Department will continue to work with stakeholders on the current source loading model to ensure the best methodologies and data are utilized. Brevard County, in partnership with FDOT, the military, and local governments, has started the process of updating and revising model components through the development of the Spatial Watershed Iterative Loading model. The Department is currently reviewing this model and will continue its dialogue with Brevard County and other partners. New information collected about the ecological function of the IRL through the IRL Initiative may provide additional clarification on how nutrients cycle through the system, allowing further model refinement. Stakeholders have also noted the need for additional funding to support water quality restoration activities.

Section 5: SOUTHERN IRL

5.1 BACKGROUND

While developing the Central IRL BMAP, the Department identified a potential connection with the portion of the IRL located immediately to the south of the Central IRL subbasin. This is WBID 3190, and drainage from the C-25 west and east segments (WBIDs 3160 and 3163B) and Fort Pierce Farm Canal (WBID 3163) drain to this segment of the IRL (refer to **Figure 12**). It appears that there is a hydrologic connection between WBID 3190 and WBID 5003B, which is the southern-most WBID in the Central IRL subbasin. Based on this connection, the Department and the stakeholders in the southern IRL area agreed to include projects in the BMAP, as projects implemented in the southern IRL subbasin will benefit the Central IRL subbasin.

5.2 ACTIVITIES DURING THE REPORTING PERIOD

The accomplishments over the past year are described in **Section 5.2.1** and **Section 5.2.6**, and the individual project tables are included in **Appendix A**.

5.2.1 CITY OF FORT PIERCE

The City of Fort Pierce increased the frequency of street sweeping and extended the routes into newly annexed areas (Project FP-5). The city completed design work on the Heathcote Botanical Gardens (Indian Hills Recreation Area) Stormwater Improvements (Project FP-1). The construction contract has been let and construction is scheduled to begin in May 2014. In addition, the city has completed 60% design work on the Veterans Park Stormwater Improvements (Project FP-8), with construction anticipated to start in late 2014.

5.2.2 FDOT DISTRICT 4

FDOT District 4 has two swales projects (Projects FDOT4-25 and FDOT4-26) under construction in the southern IRL. In addition, FDOT District 4 provided information the dry detention pond at Kings Highway (Project FDOT4-24), which was previously completed but missing from the BMAP.

5.2.3 FORT PIERCE FARMS WCD

Fort Pierce Farms WCD has adopted the discharge criteria permit manual and it is in force (Project FPF-3). New land use changes or development projects are currently being reviewed against the discharge criteria.

5.2.4 NORTH ST. LUCIE RIVER WCD

The North St. Lucie River WCD has continued its maintenance and canal cleaning efforts (Project NSLR-3) during the reporting period. In addition, the district has ongoing research into potential BMAP projects and it will update the Department when more information becomes available. In particular, the District is looking at setting up parameters for a pilot project for vegetation harvesting to quantify nutrient removal.

5.2.5 ST. LUCIE COUNTY

St. Lucie County's stormwater management projects in 2013 focused on retrofitting several existing neighborhoods in watersheds that ultimately drain to the IRL. The design and permitting of the Paradise Park Phase IV drainage retrofit (Project SLC-3) is complete. This project will provide stormwater management, water quality treatment, and paved roads to 55 acres of this 171-acre single family, residential neighborhood draining to the IRL via Canal C-25. Construction of the \$6.6 million Indian River Estates Phase II drainage retrofit is ongoing. The project will provide a drainage conveyance system to the pump station, alum injection, and wet detention facilities constructed in Phase I of the project. When completed, this system will provide stormwater management and water quality treatment to this 1,200-acre single family residential neighborhood draining to the IRL via the Savannas State Preserve. The county also completed the design and permitting of the San Lucie Plaza Master Drainage Plan (Project SLC-7) was completed. This project will provide stormwater management, water quality treatment, and paved roads to a 175-acre single family residential neighborhood draining to the IRL via SFWMD Canal C-25.

The county continued its public education and outreach efforts (Project SLC-1). In October 2013, the St. Lucie County Environmental Resources Department began the year-long "The Lagoon and You Resource Education Program" by Cooperative Extension and the Oxbow Eco-Center. This program was implemented with a grant award of \$37,000 from the IRL National Estuary Program, through SJRWMD. The program is educating more than 5,000 county youth and their families about the diversity and importance of the IRL and the effect of their footprint. Through an educational and interactive program, students are learning about the lagoon's unprecedented variety of life, and how critical it is to protect the environment from human impacts. The focus is on preventing and reducing pollution. In partnership with the St. Lucie School Board, the program includes in-class presentations to 3rd through 5th graders and field trips to the IRL. St. Lucie County is providing cash and in-kind match

of up to \$24,269 while the St. Lucie School Board is providing up to \$25,575 in in-kind services (transportation costs).

In addition, the county has implemented an oyster reef program. This program completed 2,358 square feet of oyster restoration at Wildcat Cove with the assistance of the IRL National Estuary Program. Construction has been postponed to allow for permitting of another oyster reef inside the adjacent mosquito control impoundment. The program also initiated construction of an 8,200 square foot oyster reef at Site 1 (in the Fort Pierce Yacht Club area). A total of 850 square feet has been filled to date with oysters.

5.2.6 *WATER QUALITY AND BIOLOGICAL MONITORING*

Fort Pierce Farms WCD continued to monitor its five quarterly water quality stations in the basin, and North St. Lucie River WCD continued to monitor its one quarterly water quality station in the basin. SFWMD continued monitoring its four water quality stations in the basin; station SLT24 at the Taylor Creek Basin 1 Outfall has been discontinued as a sampling site. In 2012, SFWMD relocated station IRL39 and it was renamed IRL39B. The intent was to locate the station closer to the seagrass monitoring. Chlorophyll-*a* is measured at each of the four water quality sites, and SFWMD now takes weekly grab samples at station C25S50 for TP, nitrate + nitrite, and total Kjeldahl nitrogen. SFWMD also continued its two flow stations in the basin. In addition, SFWMD continued its seagrass transect monitoring in the southern IRL, and this monitoring collects data about the seagrass, phytoplankton, epiphyte coverage, and water quality along each transect.

5.2.7 *AGRICULTURE*

FDACS currently has two field staff and two contracted staff in SJRWMD, working in more than a dozen basins with adopted BMAPs. There have been few new enrollments in the southern IRL subbasin since BMAP adoption, due to the loss of a contracted employee who was covering the area. FDACS will be looking into providing additional staff coverage for the area. Additionally, the southern IRL subbasin shows a loss of enrolled citrus acreage from what was included in the BMAP due to the removal of out of production groves (see **Table 6**).

TABLE 6: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE SOUTHERN IRL

N/A = Not applicable

¹ FDACS staff-adjusted acreage for purposes of enrollment is based on a review of more recent aerial imagery in the basin and local staff observations.

2008 SFWMD LAND USE	2008 ACRES	FDACS ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIS
Pasture	32,469.4	32,469.4	Cow/Calf; Future (hay)	19,509.8	11
Row/Field/Mixed Crops	3,758.8	3,758.8	Vegetable/Agronomic Crops	0.0	N/A
Horse Farm	86.7	86.7	Equine	0.0	N/A
Citrus	63,383.8	33,936.0	Ridge Citrus; Flatwoods Citrus	38,976.3	114
Abandoned Citrus	4,003.6	N/A	No enrollment needed	N/A	N/A
Tree Crops	223.7	223.7	Specialty Fruit & Nut	255.1	1
Ornamentals	299.6	299.6	Container Nursery	690.1	7
Specialty Farms	14.8	14.8	Conservation Plan Rule	0.0	N/A
Dairies	751.7	751.7	Lake Okeechobee Protection Plan / Conservation Plan Rule	5,671.4	3
Total	104,992.1	71,540.7	N/A	65,102.7	136
5-Year Enrollment Goal (90%)	N/A	64,386.6	N/A	N/A	N/A
Acreage Enrolled as of December 2013	N/A	65,102.7	N/A	N/A	N/A
Remaining Acres to Enroll	N/A	0.0	N/A	N/A	N/A

5.3 FUNDING

The City of Fort Pierce received a \$900,000 TMDL grant for the Indian Hills stormwater improvements (Project FP-1) and a \$510,000 Section 319 grant for this project. In addition, the city received a \$462,000 TMDL grant for the Veterans Park stormwater improvements (Project FP-8), and the city has a Section 319 grant pending for this project.

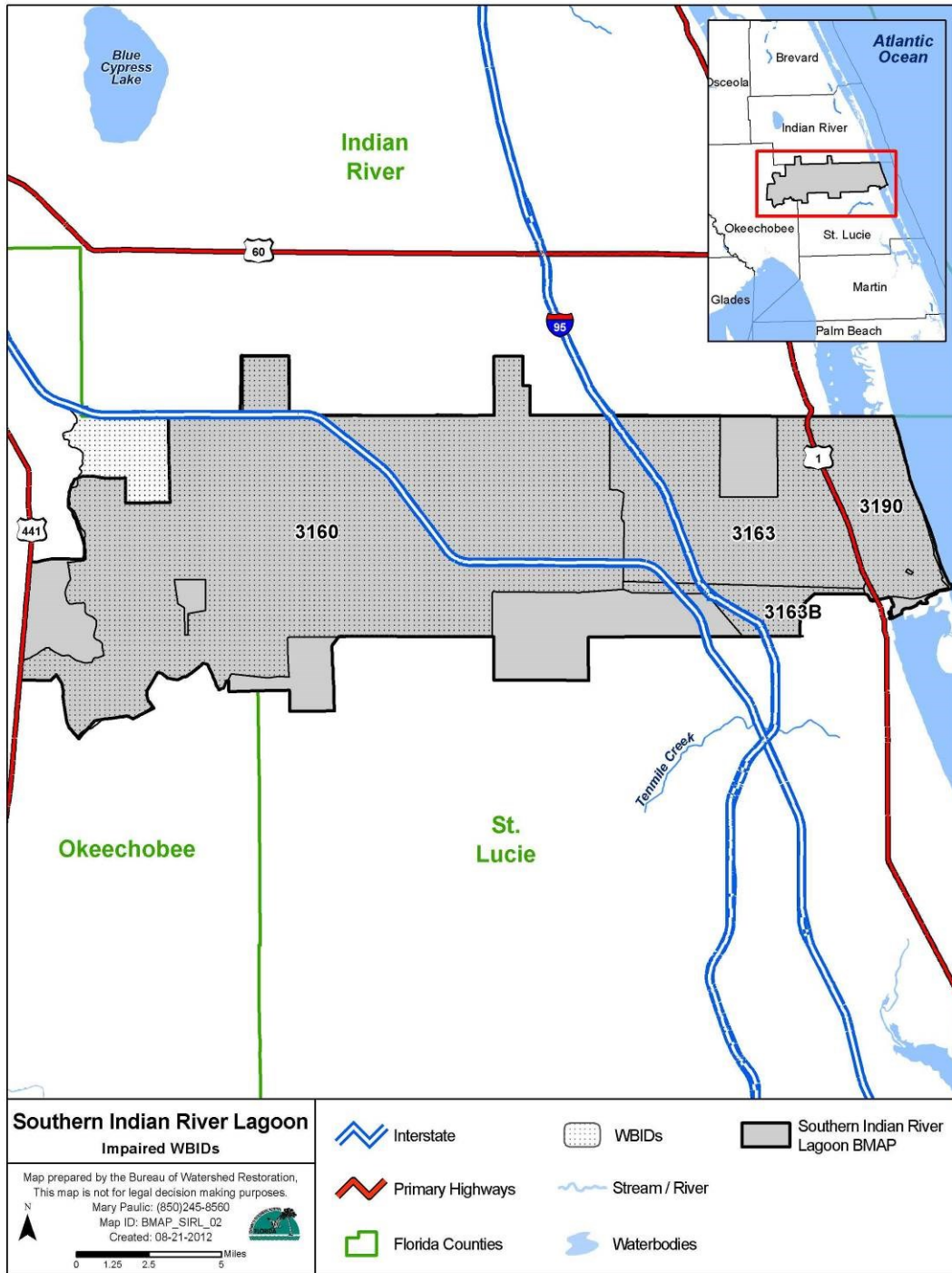


FIGURE 12: SOUTHERN IRL BASIN

5.4 ACTIVITIES IN THE UPCOMING REPORTING PERIOD FOR THE SOUTHERN IRL

5.4.1 CITY OF FORT PIERCE

The City of Fort Pierce will complete the Heathcote Botanical Gardens (Indian Hills Recreation Area) Stormwater Improvements (Project FP-1) in 2014.

5.4.2 FDOT DISTRICT 4

In 2014, FDOT District 4 will complete two swales projects (FDOT4-25 and FDOT4-26).

5.4.3 WATER QUALITY AND BIOLOGICAL MONITORING

Fort Pierce Farms WCD will continue to monitor its five quarterly water quality stations, North St. Lucie River WCD will continue to monitor its one quarterly water quality station, and SFWMD will continue to monitor its four water quality stations and two flow stations. SFWMD will also continue its seagrass transect monitoring in the southern IRL.

5.5 MANAGEMENT STRATEGIES FOR THE SECOND BMAP ITERATION IN THE SOUTHERN IRL

5.5.1 FORT PIERCE FARMS WCD

The Fort Pierce Farms WCD is looking into multiple potential projects at this time and will update the Department when more information becomes available.

5.5.2 NORTH ST. LUCIE RIVER WCD

The North St. Lucie River WCD is looking into multiple potential projects at this time and will update the Department when more information becomes available.

APPENDIX A: BMAP PROJECTS

The BMAP project tables below show the implementation status of the BMAP projects as of February 28, 2014. The tables provide information on the nutrient reduction attributed to each individual project, shown in lbs/yr. These projects were submitted to provide reasonable assurance to the Department that each entity has a plan on how they will meet their allocation; however, this list of projects is meant to be flexible enough to allow for changes that may occur over time, provided that the reduction is still met within the specified timeframe.

TABLE A-1: BREVARD COUNTY PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	PROJECT COST	ANNUAL OPERATIONS AND MAINTENANCE (O&M)	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
BC-1	Tadlock and Goat Creek Baffle Box	Baffle box	Central A	22.1	\$43,811	N/A	2000	Completed	1	0.4
BC-2	Oak Street Drainage Improvements	Swale, baffle box	Central A	0.3	\$660,285	N/A	2003	Completed	1	0.2
BC-3	Melbourne Shores Ponds	Pond	Central A	135.9	\$939,543	N/A	2004	Completed	156	48.4
BC-4	Church Street Pond Cleanout	Cleanout	Central SEB	172.1	Unknown	N/A	2012	Completed	137	25.5
BC-5	Education Efforts	FYN, fertilizer and pet waste ordinances, PSAs, pamphlets, website, illicit discharge program	County wide	N/A	Unknown	N/A	Ongoing	Ongoing	Not quantified	Not quantified
BC-6	Street Sweeping	Street sweeping	Central A	N/A	Unknown	N/A	Ongoing	Ongoing	60	26.9
BC-7	Valkaria Lakes	Wet detention pond	Central A	457.7	\$261,000	N/A	2012	Ongoing	700	166.1
BC-8	Wheeler Properties	Wet detention pond	Central SEB	16,403.5	\$3,500,000	\$2,000	2015	Planned, Partially Funded	28,760	9,259.6
BC-9	Micco I	Exfiltration/ denitrification	Central SEB	7.6	\$175,599	\$1,000	2014	Planned, Funded	92	10.0
BC-10	Micco B	Dry detention	Central SEB	44.7	\$846,176	\$1,000	N/A	Planned, Funded	23	4.2
BC-11	Mockingbird Pond	Managed aquatic plant system (MAPS)	Central SEB	26.7	\$12,401	\$5,565	N/A	Funded	27	3.3
BC-12	Church Street Pond MAPS	MAPS	Central SEB	172.1	\$4,212	\$2,106	2010	Completed	217	37.1
BC-13	Wheeler Flemming Grant	Wet detention pond	Central SEB	134.4	\$523,037	Unknown	2015	Funded	745	316.5
BC-14	Fountainhead	Aquatic vegetation harvesting	Central A	7.7	\$39,274	To be determined	10/2013	Completed	489	79.1
BC-15	Corey Road at Hall	Type 1 baffle box retrofit	Central A	51.8	\$15,000	To be determined	2014	Started	36	2.8
BC-16	430 Riverview	Type 1 baffle box retrofit	Central A	7.5	\$15,000	To be determined	2014	Started	7	0.7
BC-17	C-1 Re-Diversion	Pumps to increase re-division of water from the IRL to the St. Johns River	Central A	53,777	\$531,051	Funded by SJRWMD	2014	Started	46,430	5,423
N/A	Total Projects Reduction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	77,881	15,403.8

TABLE A-2: CITY OF FELLSMERE PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
F-1	State Street Improvements and Stormwater Lake Project	Wet detention pond	Central SEB	Swale and wet retention pond	49.6	Unknown	Completed	71.5	19.9
F-2	Senior League Field Park Improvements	Wet detention pond	Central SEB	Swale and wet retention pond	11.5	2008	Completed	1	0.1
F-3	City Hall/Orange Street Project	Wet detention pond	Central SEB	Swale and wet retention pond	7.6	Unknown	Envisioned, Not Funded	8	2.6
F-4	Sonrise Apartments Phase 1 & 2	Wet detention pond	Central SEB	Swale and wet retention ponds	36.2	2009	Completed	18	7.4
F-5	Grace Meadows Subdivision	Wet detention pond	Central SEB	Wet pond	18.3	2009	Completed	4.5	1.5
F-7	Solid Waste Transfer Station	Wet detention pond	Central SEB	Wet pond	5.1	2008	Completed	1	0.3
F-8	Fertilizer Ordinance	Education	Central SEB	Fertilizer ordinance	N/A	2013	Completed	Not quantified	Not quantified
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	104	31.8

TABLE A-3: CITY OF MELBOURNE PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
MEL-1	Fee & Apollo Drainage Improvements	Wet detention pond	Central A	Retrofit of a wet detention pond. No treatment is provided within the existing development.	77.0	\$525,161	2011	Completed	37	92.4
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	37	92.4

TABLE A-4: CITY OF PALM BAY PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
PB-1	Basin 11	Dredging	Central A	Dredging 8,100 feet of canal and retention pond, culvert replacements (7)	N/A	\$1,866,695	2009	Completed	Not quantified	Not quantified
PB-2	Chace Lane Pond Modifications	Dry detention pond	Central A	The work will include the repair of the existing outfall structures and washout, installation of a large concrete weir	91.2	\$20,290	2001	Completed	62	8.3
PB-3	Glenham Drive Sidewalks Improvements	Dry detention pond	Central A	Replacement of sidewalk and addition of dry pond	12.2	Unknown	Unknown	Completed	9	1.4
PB-4	Basin 7 Stormwater Improvements Phase II	Wet detention pond	Central A	A pond will be constructed on an eight-acre site	146.5	\$79,109	2009	Completed	387	124
PB-5	Boundary Canal Trail Phase 3	Baffle box	Central A	Addition of a baffle box	365.9	Unknown	Unknown	Completed	609	73.4
PB-6	Boundary Canal Phase II, stormwater improvement	Retention	Central A	Installation of berm and pipe in canal for additional treatment	632.7	Unknown	Unknown	Completed	1,633	176.1
PB-7	Boundary Canal Phase I Baffle Box Installation	Baffle box	Central A	Three chambered baffle box prior to discharge to Turkey Creek	632.7	Unknown	Unknown	Completed	395	31.2
PB-8	Norwood Street Baffle Box Installation	Baffle box	Central A	Installation of baffle boxes to minimize sediment introduction to the C-1 Canal	17.4	Unknown	Unknown	Completed	1,001	148.7
PB-9	Basin 1 Drainage Improvements (East of US 1)	Wet detention pond	Central A	A pond will be constructed on 1.5 acres of the site	136.5	\$22,247	2007	Completed	33	5.9
PB-10	Basin 13 Stormwater Improvements	Wet detention pond	Central A	Construction of wet detention pond off of Hardin Lane, west of Sandy Lane	42.4	\$200,419	2006	Completed	65	12.2
PB-11	Powell's Subdivision Paving & Drainage Improvements	Wet detention pond	Central A	Create a pond to manage the stormwater	123.6	\$147,478	2000	Completed	124	53.9
PB-12	Port Malabar Unit 40 Drainage Improvements	Wet detention pond	Central A	Construction of three retention ponds	224.3	\$23,778	2007	Completed	468	109.6

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PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
PB-13	Mandarin Ditch (South)	Swales	Central A	Removal of deleterious material from existing swale, replacement with clean fill stabilized with turf reinforcement mat and sod	73.0	\$308,797	2006	Completed	285	39.6
PB-14	Basin 3 Main Street Parking Lot	Pervious pavement	Central A	Install a parking lot within the Main Street right-of-way utilizing porous concrete pavement	358.6	\$4,845	2008	Completed	984	128.6
PB-15	Basin 3 Main Street Improvements Channel/Alignment	Other structural BMP	Central A	Installation of weirs for treatment and attenuation with slopes being stabilized with turf reinforcement mat.	358.6	\$403,561	2010	Completed	1,475	192.8
PB-16	Street Sweeping	Street sweeping	Central A	Street sweeping	N/A	\$8,900 per year	Ongoing	Ongoing	23	10.5
PB-17	Turkey Creek Maintenance Dredging	Dredging	Central A	Dredging	N/A	\$255,241	2007	Completed	Not quantified	Not quantified
PB-18	Turkey Creek Maintenance Dredging - Sump	Dredging	Central A	Dredging	N/A	Unknown	Unknown	Completed	Not quantified	Not quantified
PB-19	Anglers Drive	Baffle box	Central A	Baffle box	19.1	\$85,000	2008	Completed	19	2.1
PB-20	Worth Court	Inlet inserts	Central A	Inlet inserts	N/A	Part of PB-19	Unknown	Completed	1	0
PB-21	Basin 9 (Harris Pond)	Wet detention pond	Central A	Wet pond	73.0	\$294,519	2011	Completed	4	0.6
PB-22	Wild Rose BMP	Baffle box	Central A	Baffle box	4.6	Unknown	Unknown	Completed	5	0.5
PB-23	C-1 Canal Re-Diversion	Re-diversion	Central A	Canal re-diversion	N/A	Unknown	Unknown	Completed	Not quantified	Not quantified
PB-24	Port Malabar Inlet Inserts	Inlet inserts	Central A	Inlet inserts	N/A	\$19,518	2010	Completed	2	1
PB-25	Kent Street Baffle Box	Baffle box	Central A	Baffle box	20.8	\$50,000	2009	Completed	31	3.4
PB-26	Florin Pond	Dry detention pond	Central A	Dry pond	25.9	\$150,000	2000	Completed	26	5.9
PB-27	FYN, ordinances, pamphlets, PSAs, website, illicit discharge program	Education Efforts	Central A	Education	N/A	\$1,866,695	Ongoing	Ongoing	Not quantified	Not quantified
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	7,641	1,129.7

TABLE A-5: CITY OF SEBASTIAN PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
SEB-1	Main Street/Indian River Drive Improvements	Dry retention pond	Central SEB	4.19	2009	Completed	66	17.3
SEB-3	T-Hangar Development/Access Roads	Dry detention pond	Central SEB	11.56	2004	Completed	1	0.1
SEB-4	Louisiana Avenue Improvements Projects	Dry retention pond	Central SEB	3.08	2004	Completed	0	0.1
SEB-5	Twin Ditches Stormwater Retrofit	Wet detention pond	Central SEB	39	2007	Completed	209	105.5
SEB-6	Indian River Drive & Davis Street Baffle	Baffle box	Central SEB	96	2009	Completed	38	5.7
SEB-7	Periwinkle Drive Stormwater-City of Sebastian	Wet detention pond	Central SEB	67.6	2008	Completed	4	0.7
SEB-8	Collier Canal Stormwater Retrofit	Wet detention pond	Central SEB	531.6	2010	Completed	1,529	387.8
SEB-9	Schumann Park Improvements	Dry detention pond	Central SEB	3.8	2009	Completed	1	0.1
SEB-10	Fertilizer Ordinance	Education	Central SEB	N/A	Ongoing	Ongoing	Not quantified	Not quantified
SEB-11	Airport Drive	Baffle box	Central SEB	5	Unknown	Planned, Funded	Not quantified	Not quantified
SEB-12	Presidential Streets	Baffle box	Central SEB	15	Unknown	Ready to Begin	Not quantified	Not quantified
SEB-13	Powerline Road	Baffle box	Central SEB	2	12/2013	Completed	Not quantified	Not quantified
SEB-14	Step Septic System	Septic tank improvement	Central SEB	N/A	Unknown	Proposed	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	1,848	517.3

TABLE A-6: CITY OF VERO BEACH PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	PROJECT COST	ANNUAL O&M	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
VB-1	Date Palm Baffle Box	Baffle box	Central B	6.7	\$186,396	\$1,000	2010	Completed	9	1.0
VB-2	10 th and 12 th Avenue Baffle Boxes	Baffle box	Central B	69.9	\$97,800	\$2,000	2011	Completed	127	17.5
VB-3	Greytwig Baffle Box	Baffle box	Central B	9.8	\$75,000	\$1,000	2011	Completed	21	2.4
VB-4	Fertilizer Ordinance	Education	Central B	N/A	Unknown	Unknown	Ongoing	Ongoing	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	157	20.9

TABLE A-7: CITY OF WEST MELBOURNE PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
WM-1	Westbrooke	Wet detention pond	Central A	169.0	2004	Completed	41	4.3
WM-2	Saddlebrook	Wet detention pond	Central A	40.2	2004	Completed	1	0.2
WM-3	Stratford Point	Wet detention pond	Central A	83.7	2004	Completed	25	3.1
WM-4	Oak Grove	Wet detention pond	Central A	91.4	2010	Completed	22	2.2
WM-5	Manchester Lakes	Wet detention pond	Central A	133.3	2007	Completed	16	1.1
WM-6	Havens at Riviera	Wet detention pond	Central A	22.9	2009	Completed	6	0.6
WM-7	Cypress/Creek Imagine Schools	Wet detention pond	Central A	72.0	2009	Completed	15	1.7
WM-8	Lynnwood	Wet detention pond	Central A	28.3	2006	Completed	2	0.6
WM-9	Coastal Commerce	Wet detention pond	Central A	59.9	2009	Completed	18	2.7
WM-10	Hammock Landing	Wet detention pond	Central A	76.1	2009	Completed	11	0.8
WM-11	Crystal Lakes	Wet detention pond	Central A	91.0	2009	Completed	17	6.4
WM-12	Orange View Drive	2 nd generation baffle box	Central A	49.1	Unknown	Completed	69	8
WM-13	Stephenson Drive	2 nd generation baffle box	Central A	14.1	Unknown	Completed	21	2.6
WM-14	Parker Road	2 nd generation baffle box	Central A	13.1	Unknown	Completed	17	1.9
WM-15	Laila Drive	2 nd generation baffle box	Central A	21.9	Unknown	Completed	31	3.5
WM-16	Doherty Drive	2 nd generation baffle box	Central A	66.0	Unknown	Completed	107	16.5
WM-17	Trend Road	2 nd generation baffle box	Central A	8.8	Unknown	Completed	12	1.4
WM-18	San Paolo	2 nd generation baffle box	Central A	2.7	Unknown	Completed	8	1.5
WM-19	San Paolo West	2 nd generation baffle box	Central A	7.7	Unknown	Completed	24	4.8
WM-20	John Carrol	2 nd generation baffle box	Central A	74.9	Unknown	Completed	109	12.3
WM-21	Street Sweeping	Street sweeping	Central A	N/A	Ongoing	Ongoing	405	182.2
WM-22	Inlet Cleaning	Inlet cleaning	Central A	N/A	Ongoing	Ongoing	5	3
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	982	261.4

TABLE A-8: FDOT DISTRICT 4 PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FDOT4-1	FM# 228595-1 (Basin 4B)	Wet detention pond	Central SEB	57.6	2007	Completed	83	30.3
FDOT4-2	FM# 228620-1	100% on-site retention	Central SEB	2.2	2005	Completed	24	3.4
FDOT4-3	FM# 228615-1	2 nd generation baffle box	Central B	59.8	2007	Completed	117	33.2
FDOT4-4	FDOT4 Street Sweeping	Street sweeping	Central SEB and B	N/A	Ongoing	Ongoing	237	151.8
FDOT4-5	FM# 228583-5 (Pond 1)	Wet detention pond	Central B	22.4	2010	Completed	65	41.6
FDOT4-6	FM# 228583-5 (Pond 2)	Wet detention pond	Central B	11.9	2010	Completed	25	15.8
FDOT4-7	FM# 228627-1 (Pond 1)	Wet detention pond	Central B	28.9	2010	Completed	83	51.7
FDOT4-8	FM# 228627-1 (Pond 2)	Wet detention pond	Central B	21.6	2010	Completed	61	38.6
FDOT4-9	Education Efforts	Pamphlets and illicit discharge program	Central SEB and B	N/A	Ongoing	Ongoing	Not quantified	Not quantified
FDOT4-10	Fertilizer Cessation	Fertilizer cessation	Central SEB and B	N/A	Unknown	Completed	Not quantified	Not quantified
FDOT4-18	FM# 228583-3 (State Road 5/US-1)	Wet detention pond	Central B	25.2	03/2007	Completed	Not quantified	Not quantified
FDOT4-19	FM#: 230873-1 (27 th Avenue Reconstruction)	100% on-site retention	Central B	14.7	09/2002	Completed	Not quantified	Not quantified
FDOT4-20	FM#: 229966-1 (State Road A1A at the Moorings)	Swales	Central B	4.1	04/2006	Completed	Not quantified	Not quantified
FDOT4-21	FM#: 413048-1 (Interstate-95 from St. Lucie / Indian River County Line to North of State Road 60)	100% on-site retention	Central B	152.2	10/2014	Started	Not quantified	Not quantified
FDOT4-22	FM# 411476-1 (Sebastian River Bridge Replacement Project)	Swales	Central SEB	0.5	08/2009	Completed	Not quantified	Not quantified
FDOT4-23	FM# 413049-1	Swales	Central SEB	76.5	12/2015	Started	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	695	366.5

TABLE A-9: FDOT DISTRICT 5 PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FDOTD5-1	D5_70010-3528-01	Wet detention pond	Central A	Add lanes/reconstruct State Road 5 from Conlan Boulevard to University Boulevard	15.6	2002	Completed	44.4	22.85
FDOTD5-2	D5_70010-3528-02	Wet detention pond	Central A	Add lanes/reconstruct State Road 5 from Conlan Boulevard to University Boulevard	8.4	2002	Completed	14.4	6.7
FDOTD5-3	D5_70012-3503-01 (Missing from model)	Wet detention pond	Central A	Add lanes/reconstruction of State Road 507 (Babcock Street) from south of State Road 514 to Port Malabar Boulevard	21.7	1989	Completed	56.7	25.75
FDOTD5-4	D5_70012-3503-02 (Missing from model)	Wet detention pond	Central A	Add lanes/reconstruction of State Road 507 (Babcock Street) from south of State Road 514 to Port Malabar Boulevard	9.1	1989	Completed	22.5	12.45
FDOTD5-5	D5_70012-3503-03 (Missing from model)	Dry detention pond	Central A	Add lanes/reconstruction of State Road 507 (Babcock Street) from south of State Road 514 to Port Malabar Boulevard	7.3	1989	Completed	14.1	7.85
FDOTD5-6	D5_70050-3544-03	Wet detention pond	Central A	Add lanes and reconstruct from 3.8 miles east of Osceola centerline to Interstate-95	5.1	2004	Completed	11.7	3.8
FDOTD5-7	D5_70100-3517-01 (Missing from model)	100% on-site retention	Central A	French drain system along State Road 5 from University Boulevard to Aurora Road	3.4	1996	Completed	12	6.7
FDOTD5-8	D5_70220-3433-01	Wet detention pond	Central A	Interchange work at State Road 514 and Interstate-95	9.3	2000	Completed	33.3	13.65
FDOTD5-9	D5_70220-3429-01 (Missing from model)	Wet detention pond	Central A	Interstate-95 and Palm Bay Road interchange	20.0	1995	Completed	49.2	32.35
FDOTD5-10	D5_70220-3429-02 (Missing from model)	Wet detention pond	Central A	Interstate-95 and Palm Bay Road interchange	25.6	1995	Completed	62.4	39.3
FDOTD5-11	D5_70220-3429-03 (Missing from model)	Wet detention pond	Central A	Interstate-95 and Palm Bay Road interchange	26.1	1995	Completed	60.6	37
FDOTD5-12	D5_70220-3429-04 (Missing from model)	Wet detention pond	Central A	Interstate-95 and Palm Bay Road interchange	21.7	1995	Completed	51.3	30.55
FDOTD5-13	D5_409034-01	100% on-site retention	Central A	Drainage improvements at State Road A1A; French drain located on southwest corner of US 192 and Miramar Avenue (A1A)	0.4	2005	Completed	1.2	0.85
FDOTD5-14	Education	Education Project	Central A	Illicit discharge program, pamphlets, flyers	N/A	Ongoing	Ongoing	Not quantified	Not quantified
FDOTD5-15	Fertilizer Cessation	Fertilizer cessation	Central A	Elimination of fertilizer use on right-of-ways	N/A	2005	Completed	1,586	0.0
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	2,020	239.8

TABLE A-10: FELLSMERE WCD PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	ANNUAL O&M COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FWCD-1	Sonrise Villas	Wet detention pond	Central SEB	13.6	Unknown	2003	Completed	11	4.5
FWCD-2	St. Johns Land Purchase	Change from agricultural to natural land use	Central SEB	2,390.6	Unknown	Ongoing	Ongoing	Not quantified	Not quantified
FWCD-3	Fellsmere Stormwater Lake and State Street Improvements	Wet detention pond	Central SEB	48.1	Unknown	2003	Completed	69	19.2
FWCD-4	Grace Meadows	Wet detention pond	Central SEB	7.7	Unknown	2009	Completed	2.5	1.1
FWCD-5	2 Inch Limitation Discharges	Retention BMPs	Central SEB	N/A	Unknown	Ongoing	Ongoing	Not quantified	Not quantified
FWCD-6	Fellsmere WCD Mechanical Canal Maintenance	Retention BMPs	Central SEB	N/A	\$54,872	Ongoing	Planned, Funded	Not quantified	Not quantified
FWCD-7	Historic Fellsmere Master Drainage Plan (partner with City of Fellsmere)	Regional stormwater treatment lakes	Central SEB	1,666	Unknown	Ongoing	Planned, Pending Grant Application	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	N/A	83	24.8

TABLE A-11: INDIAN RIVER COUNTY PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	ANNUAL O&M	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
IRC-1	Vero Lake Estates Stormwater Improvements - Phase 1	Wet detention pond	Central SEB	Subregional stormwater treatment facility for an old subdivision constructed that had no stormwater treatment	2,441.5	\$1,572,829	Unknown	2002	Completed	4,936	1,022.5
IRC-2	East Roseland Stormwater Improvements	Wet detention pond	Central SEB	Stormwater detention lake and associated stormwater conveyance systems to provide flood control and stormwater quality treatment for a watershed in Roseland that had no treatment	73.7	\$433,134	\$2,176	2005	Completed	168	38.3
IRC-3	East Gifford Stormwater Improvements	Wet detention pond	Central B	Stormwater detention lake and associated swale and piped stormwater conveyance systems to provide stormwater quality treatment for a residential community that had no treatment	44.1	\$686,136	\$2,471	2004	Completed	169	71.1
IRC-4	PC Main (formerly Main Relief Canal Pollution Control Facility) - nutrient removal from measured data	Other structural BMP	Central B	Mechanical pollution control system using self-cleaning screens in series to remove solids from the Main Relief Canal	21,941.1	\$5,240,931	\$100,000	2009	Completed	2,018	517.0
IRC-5	Egret Marsh Stormwater Park - nutrient removal from measured data	Other structural BMP	Central B	Algal turf scrubber system; initial, intermediate, and final polishing ponds; and wood stork habitat area; treats 10 million gallons per day	8,949.3	\$5,580,000	\$338,000	2010	Completed	15,512	3,185.0

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PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	ANNUAL O&M	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
IRC-6	PC South (Osprey Marsh) Algal Nutrient Removal Facility - estimated nutrient removal	Other structural BMP	Central B	An algae based nutrient removal system treating approximately 10 million gallons per day of water from the Indian River Farms WCD's South Relief Canal, and up to 1.5 million gallons per day of brine concentration from the county's South Reverse Osmosis Water Treatment Plant	17,163	\$10,000,000	\$1,364,000 (estimated)	2012	In Operation	18,000	11,000.0
IRC-7	PC North Aquatic Plant Based Nutrient Removal System (Proposed) - estimated nutrient removal	Other structural BMP	Central SEB and B	An aquatic plant based nutrient removal system treating approximately 10 million gallons per day	12,651.6	\$6,000,000	\$1,364,000 (estimated)	2017	Envisioned, Not Funded	18,000	11,000.0
IRC-8	Fertilizer Ordinance, PSAs, Website, Pamphlets, Illicit Discharge Program, Signs Along the Indian River Farms WCD Canals	Education project	Central SEB and B	Prepare and distribute educational information related to stormwater runoff, collect information on illicit discharges and investigate reports	N/A	N/A	\$52,000	Ongoing	Ongoing	Not quantified	Not quantified
IRC-9	Street Sweeping	Street sweeping	Central SEB and B	Swept approximately 670 curb miles	N/A	N/A	\$22,050	Ongoing	Ongoing	226	101.9
IRC-10	Storm Drain Cleaning with Vacuum Trucks	Other structural BMP	Central SEB and B	Cleaned 1,065 storm drains	N/A	N/A	\$19,067	Ongoing	Ongoing	Not quantified	Not quantified
IRC-11	Floating Aquatic Plant Islands in County Stormwater Ponds and Lakes	Floating islands	Central SEB and B	Floating aquatic plant islands will be installed in county golf course and stormwater ponds	N/A	Unknown	Unknown	Unknown	Envisioned, Not Funded	Not quantified	Not quantified

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	ANNUAL O&M	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
				Removes nutrients by drawing water from the IRL and mixing with reverse osmosis concentrate disposal, then distributing it through a 67-acre man-made saltwater marsh system before returning back to the IRL							
IRC-12	Spoonbill Marsh Project	Other structural BMP	Central B		N/A	Unknown	Unknown	2010	Completed	1,686	1,997.0
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	60,715	28,932.8

TABLE A-12: INDIAN RIVER FARMS WCD PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
IRF-1	Tilting Weir Gates	Other structural BMP	Central SEB and B	Installed 4 tilting weir gates to reduce velocity and timing of the discharges; “cleaner” water spills off the top of the gates and leaves the organic sediments on the bottom of the canal system; sediments are mechanically cleaned annually	Completed	Not quantified	Not quantified
IRF-2	Mechanical Removal of Floating Vegetation	Other non-structural BMP	Central SEB and B	Removed 40,000 cubic yards of water lettuce in 2009; 25,000 cubic yards through October 2010; 3,846.6 tons in 2011; 3,343 tons in 2012; 3,656 tons in 2013; material is placed on the bank to biodegrade; the berms are sloped away from the top of bank so the nutrients do not reenter the canal	Ongoing	Not quantified	Not quantified
IRF-3	Establishment of 2 Inch Discharge Rule	Other nonstructural	Central SEB and B	2 inch discharge rule within the WCD	Ongoing	Not quantified	Not quantified
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	Not quantified	Not quantified

TABLE A-13: MELBOURNE-TILLMAN WCD PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
MT-1	C-1 Re-Diversion Project	Canal re-division	Central A	Redirect flows to the USJR from the IRL during certain storm conditions; replacement of the control gates in the WCD's structure at the east end of C-1	2011	Completed	Not quantified	Not quantified
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	Not quantified	Not quantified

TABLE A-14: SEBASTIAN RIVER IMPROVEMENT DISTRICT PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
SRID-1	Establishment of 2 Inch Discharge Rule	Other nonstructural	Central SEB and B	Ongoing	Not quantified	Not quantified
SRID-2	Radial Arm Control Gates	Other structural	Central SEB and B	Envisioned, Not Funded	Not quantified	Not quantified
SRID-3	Vegetation and Sediment/Muck Removal from Canals	Other nonstructural	Central SEB and B	Ongoing	Not quantified	Not quantified
SRID-4	Education	Website	Central SEB and B	Ongoing	Not quantified	Not quantified
SRID-5	Large Regional Water Conservation/Storage Areas	Other nonstructural	Central SEB and B	Envisioned, Not Funded	Not quantified	Not quantified
SRID-6	Dispersed Water Storage/Water Farming	Other nonstructural	Central SEB and B	Envisioned, Not Funded	Not quantified	Not quantified
SRID-7	Lateral D System Stormwater Management	Other nonstructural	Central SEB and B	Ongoing	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	Not quantified	Not quantified

TABLE A-15: TOWN OF INDIAN LANTIC PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
TI-1	Pamphlets, Website, Fertilizer Ordinance	Education	Central A	Education and outreach	Ongoing	Not quantified	Not quantified
TI-2	Swale Construction	Swales	Central A	Swale construction for water quality treatment	Started	Not quantified	Not quantified
TI-3	Drainage Inlet Cleaning	Clean out	Central A	20 inlets cleaned per year	Ongoing	25	10.0
TI-4	Street Sweeping	Street sweeping	Central A	Quarterly street sweeping	Ongoing	28	18.2
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	53	28.2

TABLE A-16: TOWN OF MELBOURNE BEACH PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
MB-1	Basin 9 - Oak Street Pedway	Exfiltration trench	Central A	580 linear feet of exfiltration pipe	13.1	\$146,000	2007	Completed	127	21.0
MB-2	Basin 9 - Oak Street Pedway -Improvement Project	2 nd generation baffle box	Central A	Baffle box at the end of 6 th Avenue in Basin 9	85.7	\$146,000	2007	Completed	42	4.6
MB-3	Basin 8, 9 & 11 Oak Street Pedway -Improvement Project	Swales	Central A	780 linear feet of swales along Oak Street from First to Driftwood	45.1	\$146,000	2007	Completed	403	68.9
MB-4	Basin 1 - HMGFP Flood Water Improvements Project	2 nd generation baffle box	Central A	Baffle box at the end of Harland Ave on Riverside Drive in Basin 9	83.7	\$500,000	2010	Completed	146	16.9
MB-5	Basin 1 - HMGFP Flood Water Improvements Project	Swales	Central A	180 linear feet of swale along Harland Avenue from Jasmine to Shannon	0.9	\$500,000	2010	Completed	8	1.1

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PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
MB-6	Basin 9 - HMGFP Flood Water Improvements Project	Swales	Central A	150 linear feet of swales along Oak Street from 5 th to 6 th Avenue	1.0	\$500,000	2010	Completed	9	1.3
MB-7	Anchor Key Drainage Improvements - Basin 16	Baffle box	Central A	Baffle box and 81 linear feet of exfiltration trench	3.3	Unknown	2002	Completed	0	0.1
MB-8	Pelican Key Drainage Improvements - Basin 14	Baffle box	Central A	Baffle box and 48 linear feet of exfiltration trench	1.8	Unknown	2002	Completed	0	0.0
MB-9	Basin 5 - Ocean Ave Baffle Box	Baffle box	Central A	Baffle box at the Ocean Avenue outfall	58.3	Unknown	2000	Completed	3	2.9
MB-10	Basin 10 - Cherry Drive Baffle Box	Baffle box	Central A	Baffle box at the Cherry Drive outfall	87.4	Unknown	2000	Completed	3	2.6
MB-11	Basin 15 - Neptune Drive Baffle Box	Baffle box	Central A	Baffle box at the Neptune Drive outfall	5.8	Unknown	2000	Completed	0	0.1
MB-12	Basin 17 - Riverview Lane Baffle Box	Baffle box	Central A	Baffle box at the Riverview Lane outfall	1.1	Unknown	2000	Completed	0	0.0
MB-13	Basin 18 - Riverview Lane Baffle Box	Baffle box	Central A	Baffle box at the Riverview Lane outfall	5.9	Unknown	2000	Completed	0	0.1
MB-14	Curb Inlet Baskets - Basins 4, 6, 10 & 15	Curb inlet baskets	Central A	26 curb inlet baskets installed in Basins 4, 6, 10 and 15	118.1	Unknown	2000	Completed	5	3.5
				Redevelopment of the entire existing site formerly paved with no treatment; constructed stormwater retention						
MB-15	Melbourne Beach Chevron	100% on-site retention	Central A	Demolition of the existing 5 structures and paved parking and construction of new library with parking and stormwater management system	0.6	Unknown	2010	Completed	11	2.9
MB-16	Melbourne Beach Library	Dry detention	Central A	Demolishing existing buildings and parking and constructing new buildings with a retention area provides for treatment and attenuation	1.5	Unknown	2001	Completed	3	0.6
MB-17	Melbourne Beach Town Hall	100% on-site retention	Central A							
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	792	135.0

TABLE A-17: TOWN OF MELBOURNE VILLAGE PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	TREATMENT ACRES	PROJECT COST	ANNUAL O&M	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
MV-1	Platt Circle	Baffle box	Central A	31.1	\$124,000	\$2,500	2005	Completed	1	0.8
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.8

TABLE A-18: TOWN OF ORCHID PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL		STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
TO-1	Education Efforts	Education	Central SEB	Landscaping, fertilizer, and irrigation ordinances		Ongoing	Not quantified	Not quantified
N/A	N/A	N/A	N/A	Total Project Reductions		N/A	Not quantified	Not quantified

TABLE A-19: TURNPIKE AUTHORITY PROJECTS IN CENTRAL IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT ZONE	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
T-1	Street Sweeping	Street sweeping	Central B	144 miles swept per year	Ongoing	26	17.3
N/A	N/A	N/A	N/A	Total Project Reductions	N/A	26	17.3

SOUTHERN IRL

TABLE A-20: CITY OF FORT PIERCE PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FP-1	Heathcote Botanical Gardens (Indian Hills Recreation Area) Stormwater Improvements	Treatment train	Treatment train in the Virginia Avenue Canal drainage basin, which outfalls to the IRL	1,242	\$2,787,588 (Phase I)	2014	Construction to Start April 2014	7,140 (estimated)	1,382 (estimated)
FP-2	Moore's Creek Retrofit Phases 3 & 4	Wet detention pond	Increased detention and littoral shelves	2,382	\$825,000	2008	Completed	Not quantified	Not quantified
FP-3	South Beach Baffle Boxes	Baffle box	Trap sediment in the baffle boxes and increase volume of runoff treated in grassed swales	128	\$573,121	2006	Completed	Not quantified	Not quantified
FP-4	Moore's Creek Retrofit Phase 2	Baffle box	Increased detention and trap sediment in the baffle boxes	1,680	\$1,480,437	2003	Completed	Not quantified	Not quantified
FP-5	Street Sweeping	Street sweeping	Street sweeping	N/A	Unknown	Ongoing	Ongoing	571	257.2
FP-6	Inlet Cleaning	Inlet cleaning	Inlet cleaning	N/A	Unknown	Ongoing	Ongoing	336	110.0
FP-7	Education and Outreach Efforts	Education	Fertilizer ordinance; illicit discharge ordinance; stormwater educational shows; pamphlets, posters, mailings; industry/business educational pamphlets; storm drain inlet stencil program; and stormwater pollution hotline	N/A	Unknown	Ongoing	Ongoing	Not quantified	Not quantified
FP-8	Veterans Park Stormwater Improvements	Treatment train	Basin currently discharges to the IRL with no treatment; project entails wet detention, bio-swales, pervious pavers, aeration fountains and outfall structure	44.1	\$1,470,900	2015	Design	131 (estimated)	25.8 (estimated)
N/A	N/A	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	8,178	1,775.0

TABLE A-21: FDOT DISTRICT 4 PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	TREATMENT ACRES	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FDOT4-11	FM# 230132-1 (System 1)	Dry detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-12	FM# 230132-1 (System 2)	Dry detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-13	FM# 230132-1 (System 3)	Dry detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-14	FM# 230132-1 (System 4)	Dry detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-15	FM# 230132-1 (System 5)	Wet detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-16	FM# 230132-1 (System 6)	Wet detention pond	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-17	FM# 230132-1 (System 7)	100% on-site retention	Unknown	2001	Completed	Not quantified	Not quantified
FDOT4-24	FM# 230279-1 (Kings Highway)	Dry detention pond	24.6	10/2003	Completed	Not quantified	Not quantified
FDOT4-25	FM# 413046-1	Swales	186.8	06/2014	Started	Not quantified	Not quantified
FDOT4-26	FM# 413047-1	Swales	126.5	2014	Started	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	N/A	N/A	N/A	Not quantified	Not quantified

TABLE A-22: FORT PIERCE FARMS WCD PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
FPE-1	Canal 1 Top of Bank Swale	Swales	Collect stormwater runoff and provide some water quality benefit	0.19	\$13,040	2007	Completed	Not quantified	Not quantified
FPE-2	Canal 1 Top of Bank Dry Detention	Dry detention pond	Address stormwater runoff issues and canal bank erosion immediately upstream of the IRL	2.58	\$37,770	2009	Completed	Not quantified	Not quantified
FPE-3	Discharge Criteria	Ordinance/ rule change	More stringent than standard pre versus post; allows for approximately 11% more volume per development to be detained by the stormwater system	1 to 460	N/A	Ongoing	Ongoing	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	Not quantified	Not quantified

TABLE A-23: NORTH ST. LUCIE RIVER WCD PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT DETAIL	PROJECT COST	ANNUAL O&M COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
NSLR-1	C-25 Diversion Structure	Control structure	Replace previous pump structure with gravity flow control structure	\$179,150	N/A	2003	Completed	Not quantified	Not quantified
NSLR-2	Invasive Vegetation Removal at Canals 33 and 42	Vegetation harvesting	Mechanical removal of invasive vegetation in the canals and surrounding banks	\$16,315	\$4,088	2010	Completed	Not quantified	Not quantified
NSLR-3	Canal Maintenance Program	Vegetation harvesting	Ongoing maintenance primarily by mechanical means to keep canals free of exotic and decaying vegetation	N/A	\$9,40	Ongoing	Ongoing	Not quantified	Not quantified
N/A	Total Project Reductions	N/A	Total Project Reductions	N/A	N/A	N/A	N/A	Not quantified	Not quantified

TABLE A-24: ST. LUCIE COUNTY PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT DETAIL	TREATMENT ACRES	PROJECT COST	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
SLC-1	Education Efforts	Education	FY/N; landscaping, irrigation, fertilizer, and pet waste ordinances; PSAs, pamphlets, website, and illicit discharge program	N/A	Unknown	Ongoing	Ongoing	Not quantified	Not quantified
SLC-2	Street Sweeping	Street sweeping	470 tons/year collected	N/A	Unknown	Ongoing	Ongoing	664	299.1
SLC-3	Paradise Park Stormwater Improvement	Retention	Construction of drainage system providing 75% treatment of first 1" runoff (excluding storage via swales) and detention capacity at 10 year/24 hour event	168.1	\$1,500,000	2018	Started	Not quantified	Not quantified
SLC-4	Harmony Heights Stormwater Improvement	Retention	Construction of drainage system providing 75% treatment of first 1" runoff (excluding storage via swales) and detention capacity at 10 year/24 hour event	300	\$3,000,000	2019	Started	Not quantified	Not quantified
SLC-5	Taylor Creek Dredging	Dredging	Three phase sediment/muck removal project totaling approximately 200,000 cubic yards	41	\$7,500,000	2015	Ongoing	Not quantified	Not quantified
SLC-6	Stan Blum Memorial Park	Wet detention pond	Wet detention pond	4	Unknown	Unknown	Completed	Not quantified	Not quantified
SLC-7	San Lucie Plaza Stormwater Master Plan	Retention	Construction of drainage system providing 75% treatment of first 1" runoff (excluding storage via swales) and detention capacity at 10 year/24 hour event	175	Unknown	Unknown	Designed/Permitted	Not quantified	Not quantified
N/A	N/A	N/A	Total Project Reductions	N/A	N/A	Unknown	N/A	664	299.1

TABLE A-25: ST. LUCIE VILLAGE PROJECTS IN SOUTHERN IRL

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT TYPE	PROJECT DETAIL	END DATE	STATUS	TN REDUCTION (LBS/YR)	TP REDUCTION (LBS/YR)
SLV-1	Peninsula Drive	Detention	0.75" detention storage for western half of Peninsula Drive where there was no previous treatment	2011	Completed	Not quantified	Not quantified
N/A	N/A	N/A	Total Project Reductions		N/A	664	299.1

APPENDIX B: WATER QUALITY DATA

Table B-1 summarizes the water quality data collected by the Sebastian River Improvement District during the reporting period. At this time, the district does not upload these data to STORET. The data collected by the other entities as part of the monitoring plan are uploaded to STORET and are, therefore, not listed in this appendix.

TABLE B-1: SEBASTIAN RIVER IMPROVEMENT DISTRICT WATER QUALITY DATA

N/A – Not applicable

Note: umhos/cm is micro-ohms per centimeter, mg/L is milligrams per liter, NTU is nephelometric turbidity unit, and ppt is parts per thousand.

DATE	pH	TEMPERATURE (DEGREES CELSIUS)	SPECIFIC CONDUCTANCE (UMHOS/CM)	DISSOLVED OXYGEN (MG/L)	TURBIDITY (NTU)	SALINITY (PPT)	TOTAL DISSOLVED SOLIDS (MG/L)	TOTAL SUSPENDED SOLIDS (MG/L)	BIOLOGICAL OXYGEN DEMAND (MG/L)	NITRATE (MG/L)	CHLORIDE (MG/L)	AMMONIA (MG/L)	TOTAL KJELDAHL NITROGEN (MG/L)	TP (MG/L)
02/12/2013	7.8	21.0	1,884	6.57	3.72	1.0	1,140	<5.0	<2.0	<0.12	443	<0.040	0.46	0.061
05/28/2013	7.8	24.6	1,092	4.69	4.01	<1.0	836	<5.0	<4.0	0.27	210	<0.040	0.92	0.17
08/19/2013	7.2	27.6	938	5.49	4.63	<1.0	598	9.0	<2.0	0.17	181	<0.020	0.84	0.13
11/13/2013	7.5	21.2	1,622	7.80	4.21	1.0	1,410	<5.0	<2.0	<0.22	428	<0.020	0.36	0.10
02/20/2014	7.3	20.0	984	4.61	3.18	<1.0	844	<5.0	<4.0	0.15	210	<0.020	0.79	0.11