

2013 PROGRESS REPORT

for the Everglades West Coast Basin Management Action Plan

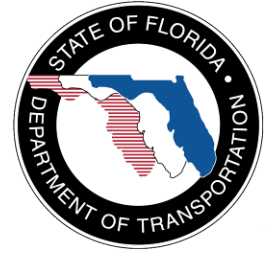
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Division of Environmental Assessment and Restoration
Watershed Restoration Program
Florida Department of Environmental Protection
Tallahassee, Florida 32399

in cooperation with the
Everglades West Coast Stakeholders

January 2014

ACKNOWLEDGEMENTS

This 2013 Everglades West Coast Basin Management Action Plan 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 Everglades West Coast stakeholders.



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LIST OF ACRONYMS AND ABBREVIATIONS

BMAP	Basin Management Action Plan
BMP	Best Management Practice
CDD	Community Development District
Department	Florida Department of Environmental Protection
DO	Dissolved Oxygen
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FYN	Florida Yards and Neighborhoods (Program)
lbs/yr	Pounds Per Year
NPDES	National Pollutant Discharge Elimination System
SFWMD	South Florida Water Management District
STORET	STOrage and RETrieval (Database)
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
UV	Ultra-Violet
WBID	Waterbody Identification

SUMMARY

TOTAL MAXIMUM DAILY LOADS

Hendry Creek and the Imperial River are both located in the Estero Bay Planning Unit within the Everglades West Coast Basin. Hendry Creek is located in the southwest part of Lee County in southwest Florida, approximately three miles south of the City of Fort Myers, and approximately three miles southeast of the City of Cape Coral. For assessment purposes, Hendry Creek is divided into a predominantly freshwater segment and a predominantly marine segment. Hendry Creek flows south for approximately six miles into north Estero Bay and drains a watershed of about 15.35 square miles. Most development is in the north end of the watershed, and wetlands and water dominate the southern portion. The Imperial River watershed covers approximately 23.1 square miles, of which 6.9 square miles are surface waters. Oak Creek and Leitner Creek flow into the upstream portion of the Imperial River. Both of these drainage areas, as well as the adjacent watershed, contain extensive areas of cropland and pastureland. As the Imperial River runs adjacent to the city of Bonita Springs, it receives extensive amounts of urban runoff along the majority of its length.

The dissolved oxygen (DO) total maximum daily loads (TMDLs) for Hendry Creek and Imperial River were adopted by the Florida Department of Environmental Protection in August 2008. The Everglades West Coast BMAP addresses the TMDLs for the following waterbody identification (WBID) numbers: WBID 3258B and WBID 3258B1 in Hendry Creek (now only WBID 3258B2), and WBID 3258E in the Imperial River (now combined with WBID 3258C to become WBID 3258EA).

The Everglades West Coast Basin Management Action Plan (BMAP) was adopted in November 2012 to implement the TN TMDLs within the watershed to address the DO impairment. This Progress Report is the first annual progress report for the Everglades West Coast BMAP, and it describes the activities that occurred during the reporting period from December 1, 2012 through November 30, 2013.

SUMMARY OF LOAD REDUCTIONS

Lee County completed one project completed in the Hendry Creek Basin during the first annual BMAP reporting period, with an estimated reduction of 4,533 lbs/yr of TN. This reduction is in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 6,664 lbs/yr of TN. The progress towards the TN TMDL load reductions is shown in **Figure ES-1**.

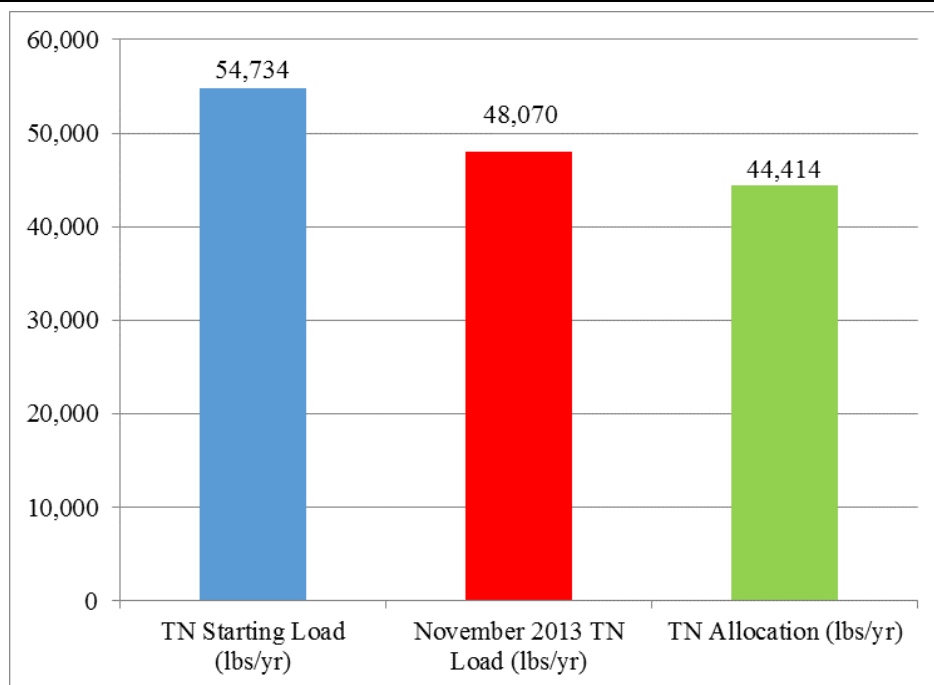


FIGURE ES-1: PROGRESS TOWARDS THE HENDRY CREEK TN TMDL THROUGH NOVEMBER 30, 2013

The City of Bonita Springs completed two projects in the Imperial River Basin during the first annual BMAP reporting period. These projects resulted in an estimated reduction of 1,093 lbs/yr of TN. These reductions are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 3,533 lbs/yr of TN. The progress towards the TN TMDL load reductions is shown in **Figure ES-2**.

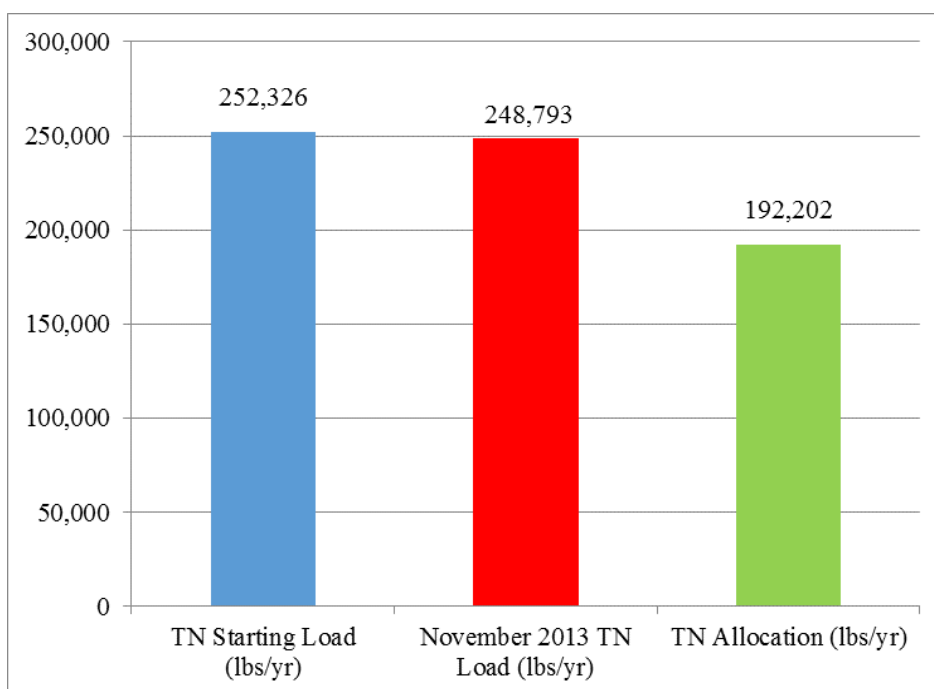


FIGURE ES-2: PROGRESS TOWARDS THE IMPERIAL RIVER TN TMDL THROUGH NOVEMBER 30, 2013

WATER QUALITY MONITORING

Lee County continued monitoring at 14 water quality stations in the Hendry Creek Basin. At four of these stations, the Department's South District collected data quarterly. Lee County also continued monitoring at five water quality stations in the Imperial River Basin. In addition, the City of Bonita Springs continued monitoring at seven water quality stations in the Imperial River Basin.

Section 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the first annual progress report for the Everglades West Coast Basin Management Action Plan (BMAP). **Section 2** and **Section 3** describe the activities that occurred during the period from December 1, 2012 through November 30, 2013 for the Hendry Creek and Imperial River basins, respectively. **Section 4** describes the water quality monitoring that occurred during the reporting period.

1.2 TOTAL MAXIMUM DAILY LOADS FOR THE CALOOSAHCHEE ESTUARY BASIN

Hendry Creek and the Imperial River are both located in the Estero Bay Planning Unit within the Everglades West Coast Basin. Estero Bay proper is a shallow, subtropical lagoon with an area of 17.7 square miles (11,317 acres) and is separated from the Gulf of Mexico by barrier islands. Seagrass beds are common in the bay, but high turbidity restricts seagrass growth to shallow depths. The Estero and Imperial Rivers and Spring, Mullock Creek, and Hendry Creek are the major tributaries that flow into Estero Bay.

Hendry Creek is located in the southwest part of Lee County in southwest Florida, approximately three miles south of the City of Fort Myers, and approximately three miles southeast of the City of Cape Coral (see **Figure 1**). For assessment purposes, Hendry Creek is divided into a predominantly freshwater segment and a predominantly marine segment. U.S. Route 41 runs between the two segments. Hendry Creek flows south for approximately six miles into north Estero Bay and drains a watershed of about 15.35 square miles (9,824 acres). Most development is in the north end of the watershed, and wetlands and water dominate the southern portion.

The Imperial River watershed covers approximately 23.1 square miles (14,784 acres), of which 6.9 square miles (4,416 acres) are surface waters. Oak Creek and Leitner Creek flow into the upstream portion of the Imperial River. Both of these drainage areas, as well as the adjacent watershed, contain extensive areas of cropland and pastureland. As the Imperial River runs adjacent to the city of Bonita Springs, it receives extensive amounts of urban runoff along the majority of its length.

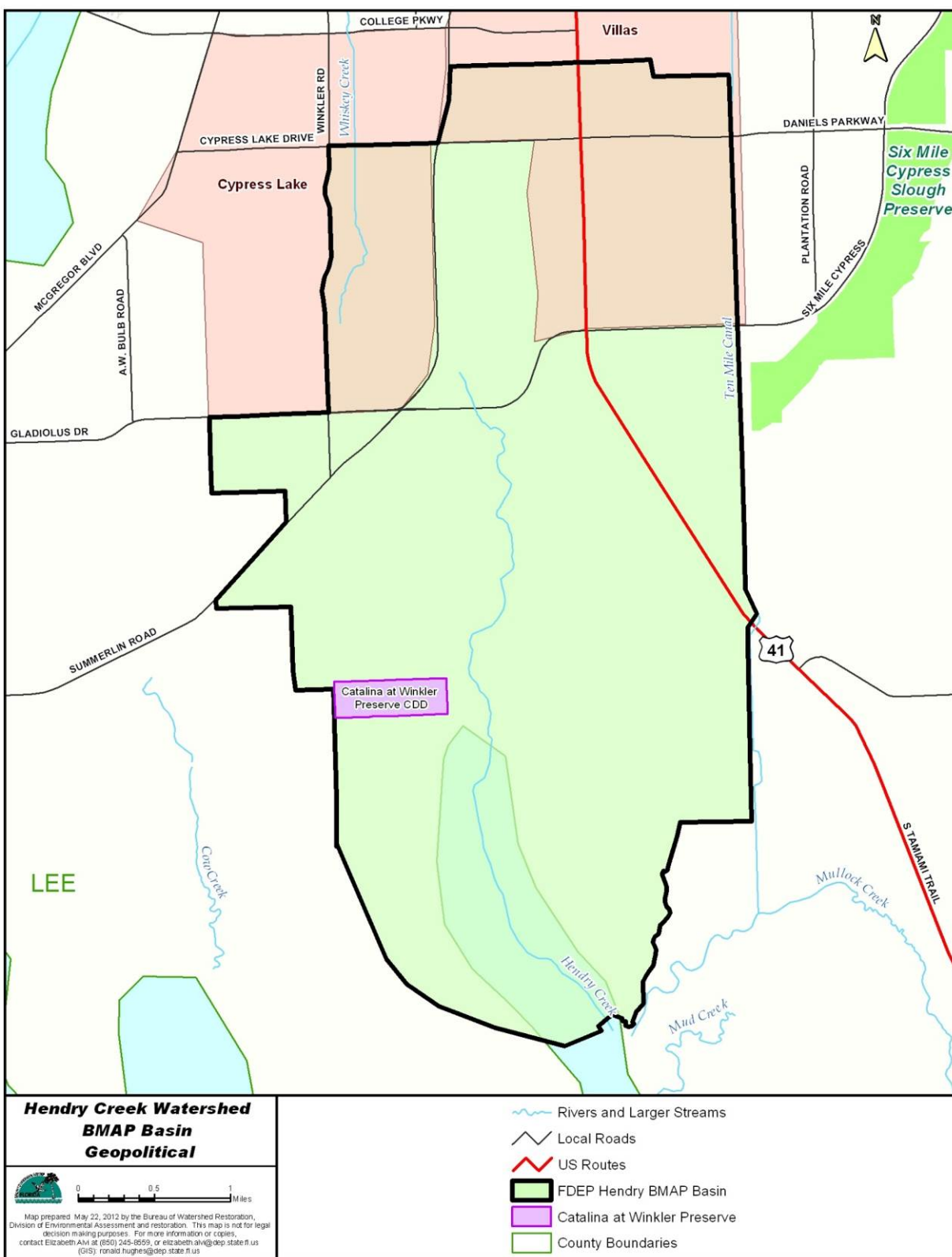


FIGURE 1: HENDRY CREEK BASIN

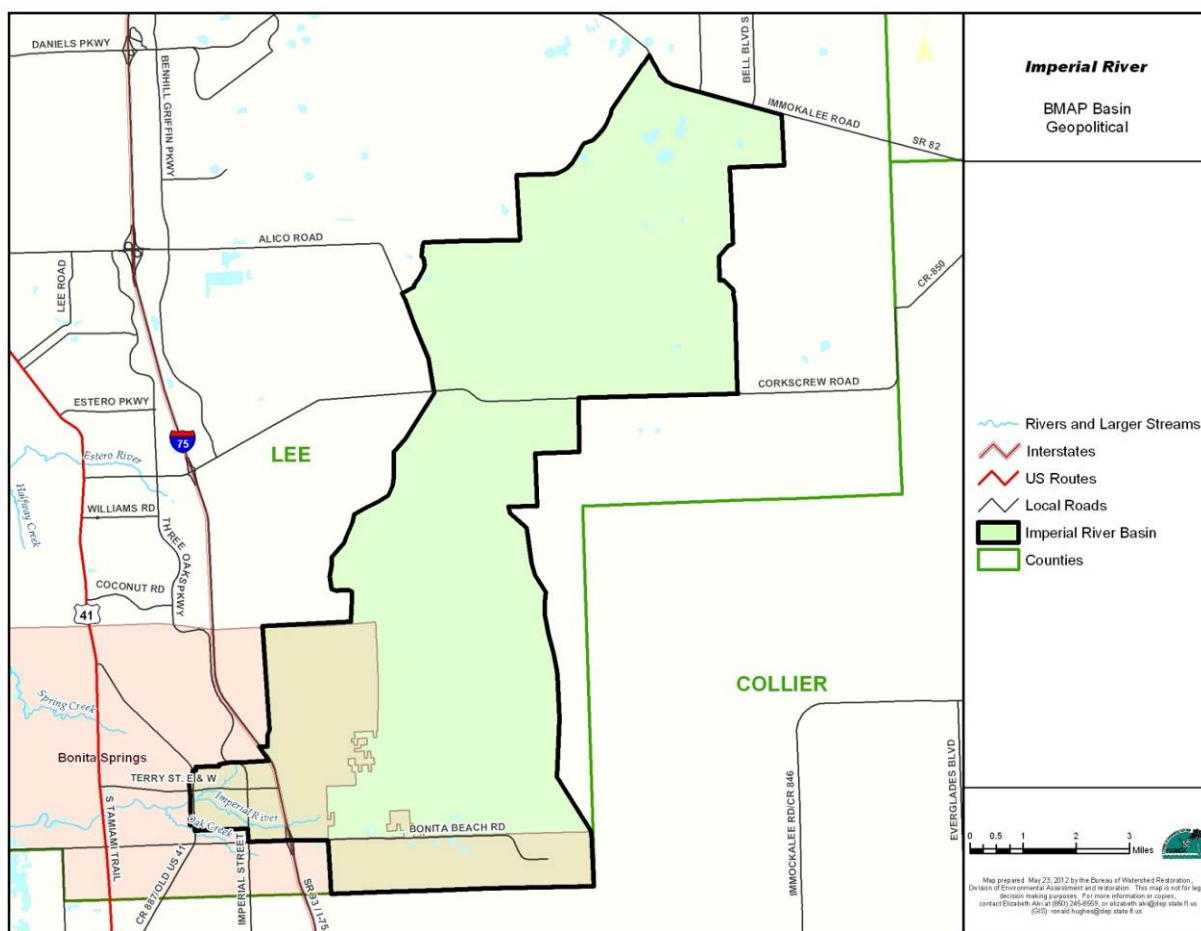


FIGURE 2: IMPERIAL RIVER BASIN

The dissolved oxygen (DO) total maximum daily loads (TMDLs) for Hendry Creek and Imperial River were adopted by the Florida Department of Environmental Protection in August 2008. The Everglades West Coast BMAP addresses the total nitrogen (TN) TMDLs for the following waterbody identification (WBID) numbers: WBID 3258B and WBID 3258B1 in Hendry Creek (now only WBID 3258B2), and WBID 3258E in the Imperial River (now combined with WBID 3258C to become WBID 3258EA).

Table 1 lists the TMDLs and pollutant load allocations adopted by rule for the watershed.

TABLE 1: EVERGLADES WEST COAST TMDLS

WBID	WATERBODY	PARAMETER	TMDL (MG/L)	WASTELOAD ALLOCATION FOR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER (% REDUCTION)	LOAD ALLOCATION (% REDUCTION)
3258B	Hendry Creek	TN	0.74	44%	44%
3258B1	Hendry Creek	TN	0.60	44%	44%
3258E	Imperial River	TN	0.74	24.87%	24.87%

1.3 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

The following organizations and entities are key stakeholders with assigned load reductions in the Hendry Creek portion of the Everglades West Coast BMAP:

- *Agriculture.*
- *Catalina at Winkler Preserve Community Development District (CDD).*
- *Lee County.*
- *Florida Department of Transportation (FDOT) District 1.*

The following organizations and entities are key stakeholders with assigned load reductions in the Imperial River portion of the Everglades West Coast BMAP:

- *Agriculture.*
- *City of Bonita Springs*
- *Lee County.*
- *FDOT District 1.*

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

1.4 BMAP ALLOCATIONS

To assign allocations based on a load reduction, the Department utilized simplified runoff and loading calculations to estimate the land-based TN load, and reduced the resulting value to the TMDL TN concentration. This approach is an interim measure while the Department reevaluates the TMDL. Using the runoff and loading calculations, the nonpoint source background load was calculated. The nonpoint source background load is defined as the load resulting from the watershed if all loads were converted to non-urban and non-agricultural land uses. The second step was to determine the nonpoint source non-background load, which is the difference between the existing load and the nonpoint source background load. This is essentially the anthropogenic nonpoint source load that is used to allocate load reductions. In order to assign allocations, the percent of the total nonpoint source non-background load was determined for each entity. Based on the allocations, the load reductions were assigned to each entity as shown in **Table 2** for Hendry Creek and **Table 3** for Imperial River.

TABLE 2: TN REQUIRED REDUCTIONS FOR THE HENDRY CREEK BASIN ENTITIES

ENTITY	AREA (ACRES)	EXISTING TN LOAD (POUNDS PER YEAR [LBS/YR])	ALLOCATION (LBS/YR)	PERCENT REDUCTION	REDUCTION REQUIRED
Lee County	10,166	53,582	43,498	18.8%	10,084
Catalina CDD	111	158	158	0.2%	0
FDOT	89	325	262	19.4%	63
Agriculture	98	668	495	25.9%	173
Total	10,464	54,734	44,414	18.9%	10,320

TABLE 3: TN REQUIRED REDUCTIONS FOR THE IMPERIAL RIVER BASIN ENTITIES

ENTITY	AREA (ACRES)	EXISTING TN LOAD (LBS/YR)	ALLOCATION (LBS/YR)	PERCENT REDUCTION	REDUCTION REQUIRED
Lee County	26,113	94,469	92,913	1.6%	1,556
City of Bonita Springs	7,154	37,426	27,524	26.5%	9,903
FDOT	96	347	252	27.4%	95
Agriculture	11,597	120,084	71,514	40.4%	48,570
Total	44,960	252,326	192,202	23.8%	60,125

Section 2: HENDRY CREEK ACTIVITIES DURING THE REPORTING YEAR

The accomplishments in the Hendry Creek basin over the past year are described in **Section 2.1** through **Section 2.2**, and the individual project tables are included in **Appendix A**.

2.1 ACTIVITIES BY ENTITY IN THE HENDRY CREEK BASIN

2.1.1 FDOT DISTRICT 1

FDOT District 1 continued to distribute stormwater educational information and implement illicit discharge detection and elimination training (project HC-FDOT-4). Street sweeping activities continued to be performed consistent with executed contracts (project HC-FDOT-3).

2.1.2 LEE COUNTY

Lee County construction of the Lakes Park Water Quality Restoration Project (LC-1) was completed in November 2012 (see **Figure 3**). SFWMD provided \$1.5 million in matched funds to the project in fiscal year 2012, and \$435,000 in previous years. The new 40-acre filter marsh consists of a series of “peninsulas” alternating from the east and west bank of Lakes Park to create a sinuous flow path similar to the Reflection Lakes Flow Way to the north (see **Figure 4**). This sinuous path maximizes the flow distance and contact time between the lake water and the vegetative plantings. The peninsulas are varying in width and height with the highest point being less than 1.0 foot above the control elevation (2.83 feet above sea level). During high flow events, most of the peninsulas will be submerged to allow flood water transport. The peninsulas are planted with trees, shrubs, and herbaceous vegetation native to Florida. The areas adjacent to the peninsulas are underwater “littoral shelves” that extend horizontally at a shallow slope out to a depth of 0.5 feet below sea level. The shelf supports native herbaceous and floating plants to absorb nutrients from the water.



FIGURE 3: LEE COUNTY LAKES PARK WATER QUALITY RESTORATION PROJECT RIBBON CUTTING



FIGURE 4: LEE COUNTY LAKES PARK WATER QUALITY RESTORATION PROJECT

Beyond that point, the slope steepens to the bottom of the lake (average depth approximately -6.0 feet below sea level) to create a main flow way for storm water and provide aquatic life refugia. The filter marsh construction included removing top material and exotic vegetation from the spoil islands in the middle of Lakes Park to convert those areas into shallow, submerged, meandering littoral shelves to support wetland vegetation plantings (see **Figure 5**). Lee County estimates that the filter marsh system alone will remove approximately 8,000 lbs/yr TN and 500 lbs/yr TP by macrophyte uptake, settling, and denitrification as well as bi-annual plant harvesting. Lakes Park Filter Marsh has been harvested three times between December 1, 2012 and November 15, 2013 with a total of 177 cubic yards of vegetation removed at a cost of \$37,440.50.



FIGURE 5: LEE COUNTY LAKES PARK WATER QUALITY RESTORATION PROJECT LITTORAL ISLAND PLANTING

Lee County conducted a pilot study at the Lakes Park Filter Marsh to determine the costs and benefits of ultra-violet (UV)/bio-carbon treatment as an enhancement to passive surface water treatment systems. UV/bio-carbon treatment is an emerging field of research. The lead investigator for this pilot project, HSA Engineers & Scientists, Inc., the county's engineering consultant for the project, specialized in nutrient removal optimization for the Comprehensive Everglades Restoration Project. HSA initially conducted literature research finding strong evidence from various bodies of work that UV light can be used to cleave organic nitrogen, and that the resulting products are ammonia and nitrate. Ammonia and nitrate/nitrite are relatively easy forms of nitrogen to treat. Ammonia is easily converted to nitrate by denitrifying bacteria under aerobic conditions, and under anaerobic conditions, nitrate in the presence of bio-carbon is readily converted to nitrogen gas (denitrification), effectively removing it from surface waters. The pilot study was conducted after the Lakes Park Filter Marsh was operational, at which time HSA and Lee County determined that a new pilot study site had to be selected because the nitrogen levels in the test feed waters at Lakes Park was not sufficient to demonstrate any significant benefit from the treatment. In fact, a comparison of the samples taken before and after construction of the filter marsh, for the pilot project after the filter marsh became operational, show a marked improvement in nitrogen concentrations in the water column unrelated to the pilot testing. **Table 4** shows a comparison of pre-filter marsh samples compared to post-filter marsh construction samples. The pilot will be moved and continued at a site near the Caloosahatchee River this coming year.

TABLE 4: LAKES PARK UV/BIO-CARBON PILOT DATA FOR PRE-FILTER MARSH VERSUS POST-FILTER MARSH SAMPLES

¹Average data (May-September, 2012, source: SFWMD – DB Hydro database).

² Average data from pilot testing.

SAMPLING SITE	SAMPLING DATE	TOTAL AMMONIA (MG/L AS NITROGEN)	TOTAL KJELDAHL NITROGEN (MG/L)	NITRATE/NITRITE (MG/L AS NITROGEN)	TN (MG/L)
Franking Locks S79 (pre-project)	May-Sept 2012 ¹	0.32	1.17	0.45	1.62
Lakes Park (pre-project)	November 2010	0.15	0.79	0.15	0.94
Lakes Park Pilot (post-project)	Mar/Apr 2013 ²	0.008	0.59	0.003	0.59

The county continued its street sweeping in the Hendry Creek Basin (project LC-2), sweeping 31.95 lane miles during the reporting period. In addition, the county continued its education and outreach efforts (project LC-3), which included 2 resolutions of illicit discharge complaints in the Hendry Creek Basin; 2,511 NPDES website hits (countywide); 20 proactive illicit discharge inspections in the Hendry Creek Basin; 154 people in 4 classes for illicit discharge training (countywide); 151 new landscape companies registered with Lee County (countywide); 3,799 people through 64 public outreach presentations (countywide); 300 people in 12 classes for Green Industries-Best Management Practice (BMP) training (countywide); and 4,142 people in 148 classes for Florida Yards and Neighborhoods (FYN) Program training (countywide). The county also implemented its fertilizer ordinance, and the compliance and enforcement activities for this ordinances are summarized in **Table 5**.

TABLE 5: LEE COUNTY FERTILIZER ORDINANCE COMPLIANCE AND ENFORCEMENT ACTIVITIES

COMPLIANCE ACTIVITY	NUMBER OF INSPECTIONS
Compliant with Ordinance	4
Verbal Warning of Non-compliance	0
Written Warning of Non-compliance	0
Written Citation of Non-compliance	0
Total Inspections for 12/2012 to 11/2013	4

In addition to the compliance inspection, enforcement, and public education and outreach activities listed above, Lee County Division of Natural Resources has partnered with the Charlotte Harbor National Estuary, the City of Bonita Springs, Lee County Hyacinth Control District, private businesses, and private homeowners to conduct neighborhood stormwater pond workshops. The county's first workshop of this kind was at the City of Bonita Springs Town Hall on September 24, 2013. The workshop lasted four hours, and there were eight volunteers assisting 65 attendees represented by homeowners associations, individuals, CDDs, private businesses, students, and lake managers. The content was well received, and in addition to developing new content for future use, the county distributed a lot of useful information to the group. Lee County plans to conduct more workshops in the future in an effort to increase awareness of sustainable pond management practices and stormwater runoff pollution. The county previously applied for grant funding through the Charlotte Harbor National

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Estuary Program, and although they were not successful in obtaining funds, the county plans to continue applying for other grant sources and working with homeowners on education and implementing low-cost BMPs. The Charlotte Harbor National Estuary Program did provide \$2,200 in matched funds in November 2013 for Lee County's new Citizen's Stormwater Academy public education program.

2.1.3 AGRICULTURE

To date, FDACS has enrolled 30.7 acres of the agricultural lands in the Hendry Creek Basin in BMPs. This represents 33.7% of the agricultural lands in the basin (**Table 3**).

TABLE 6: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE HENDRY CREEK BASIN

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.
N/A – Not applicable

2004 SFWMD LAND USE	2004 ACRES	FDACS-ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOTICES OF INTENT
Pasture	0.2	N/A	Cow/Calf, Future (Hay)	0.0	0
Row/Field/Mixed Crops	87.1	50.5	Vegetable/Agronomic Crops	0.0	0
Tree Nurseries	0.0	5.0	Future Nursery, Specialty Fruit and Nut	0.0	0
Ornamentals	10.6	35.6	Container Nursery	30.7	2
Totals	97.9	91.1	N/A	30.7	2
Five-year Enrollment Goal (50%)	N/A	45.6	N/A	N/A	N/A
Acreage Enrolled (as of December 31, 2011)	N/A	30.7	N/A	N/A	N/A
Remaining Acres to Enroll	N/A	60.4	N/A	N/A	N/A

2.2 SUMMARY OF LOAD REDUCTIONS IN THE HENDRY CREEK BASIN

The project completed in the Hendry Creek Basin during the first annual BMAP reporting period is shown summarized in **Table 7**, and this project resulted in an estimated reduction of 4,533 lbs/yr of TN. This reduction is in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 6,664 lbs/yr of TN.

The progress towards the TN TMDL load reductions is shown in **Figure 6**. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current estimated loading with the implementation of projects. The third bar shows the total allocation for stormwater runoff to meet the TMDL.

TABLE 7: SUMMARY OF PROJECTS COMPLETED IN THE REPORTING PERIOD (DECEMBER 1, 2012 THROUGH NOVEMBER 30, 2013) IN THE HENDRY CREEK BASIN

ENTITY	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)
Lee County	LC-1	Lake Park Water Quality Restoration	4,533
Total	N/A	Total Reductions in Reporting Period	4,533

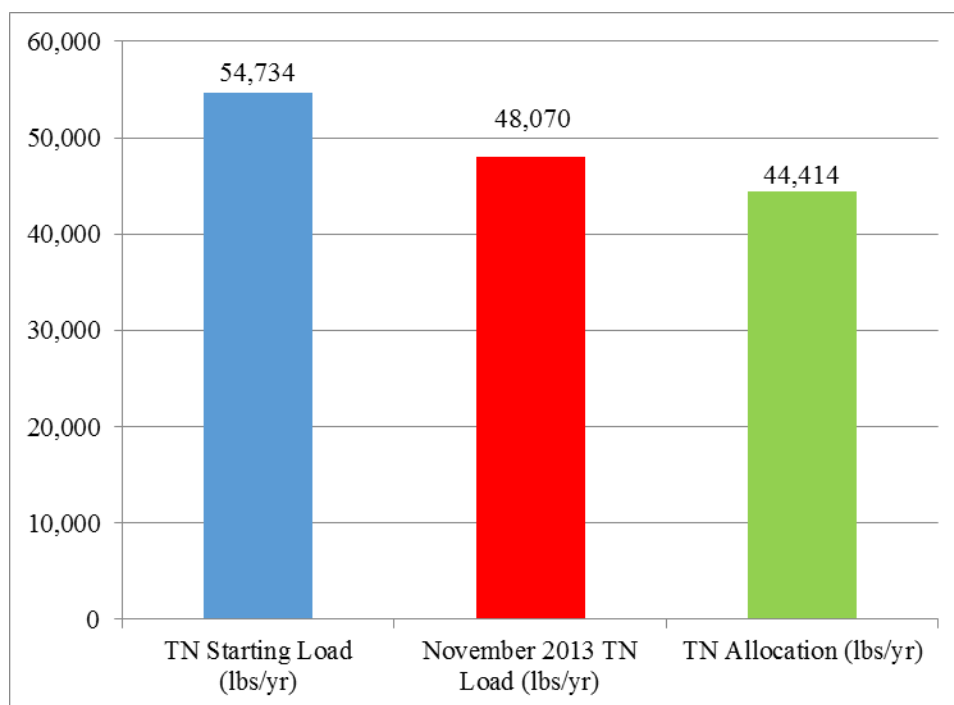


FIGURE 6: PROGRESS TOWARDS THE HENDRY CREEK TN TMDL THROUGH NOVEMBER 30, 2013

Section 3: IMPERIAL RIVER ACTIVITIES DURING THE REPORTING YEAR

The accomplishments in the Imperial River basin over the past year are described in **Section 2.1** through **Section 2.2**, and the individual project tables are included in **Appendix A**.

3.1 ACTIVITIES BY ENTITY

3.1.1 CITY OF BONITA SPRINGS

The City of Bonita Springs completed the Felts Avenue Stormwater Treatment project (BS-7). The city also began implementation of the FYN Program in February 2013. The City of Bonita Springs hosted FYN Introductory Workshops on April 10, 2013, April 27, 2013, and June 22, 2013. The city also hosted a FYN Neighborhood Lakes and Ponds Management Workshop on September 14, 2013, and a FYN native plant sale on February 9, 2013. The city spend \$66,200 on TMDL monitoring, \$10,000 on BMAP assistance, and \$200,000 on implementation of the stormwater master plan in fiscal year 2012-2013.



FIGURE 7: CITY OF BONITA SPRINGS FELTS AVENUE STORMWATER PROJECT



FIGURE 8: CITY OF BONITA SPRINGS FELTS AVENUE STORMWATER PROJECT



FIGURE 9: CITY OF BONITA SPRINGS FELTS AVENUE STORMWATER PROJECT

3.1.2 FDOT DISTRICT 1

FDOT District 1 continues to distribute stormwater educational information and implement Illicit Discharge Detection and Elimination Training (project IR-FDOT-3).

3.1.3 LEE COUNTY

Lee County continued its street sweeping in the Imperial River Basin (project LC-3), which included sweeping 7.95 lane miles. The county also continued its education and outreach efforts (project LC-5). In addition to the efforts summarized in **Section 2.1.2**, the county resolved to five illicit discharge complaints and conducted 55 proactive illicit discharge inspections in the Imperial River Basin.

3.1.4 AGRICULTURE

To date, FDACS has enrolled 6,273.7 acres of the agricultural lands in the Imperial River Basin in BMPs. This represents 95.3% of the agricultural lands in the basin; therefore, FDACS has more than achieved the 50% enrollment goal for the first, five-year BMAP iteration (**Table 3**).

TABLE 8: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE IMPERIAL RIVER BASIN

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.
N/A – Not applicable

2004 SFWMD LAND USE	2004 ACRES	FDACS-ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOTICES OF INTENT
Pasture	5,076.5	3,245.9	Cow/Calf, Future (Hay)	0.0	0
Row/Field/Mixed Crops	5,098.8	2,535.3	Vegetable/Agronomic Crops	5,463.3	3
Fallow Cropland	319.4	N/A	N/A	N/A	N/A
Citrus	944.0	717.8	Ridge Citrus, Flatwoods Citrus	736.9	1
Tree Nurseries	68.5	23.3	Future Nursery, Specialty Fruit and Nut	0.0	0
Ornamentals	67.7	51.7	Container Nursery	73.5	5
Specialty Farms	29.7	12.1	Conservation Plan Rule	N/A	N/A
Totals	11,604.6	6,586.2	N/A	6,273.7	9
Five-year Enrollment Goal (50%)	N/A	3,293.1	N/A	N/A	N/A
Acreage Enrolled (as of December 31, 2011)	N/A	6,273.7	N/A	N/A	N/A
Remaining Acres to Enroll	N/A	312.5	N/A	N/A	N/A

3.2 SUMMARY OF ACCOMPLISHMENTS IN THE IMPERIAL RIVER BASIN

The projects completed in the Imperial River Basin during the first annual BMAP reporting period are summarized in **Table 7**. These projects resulted in an estimated reduction of 1,093 lbs/yr of TN. These reductions are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 3,533 lbs/yr of TN.

The progress towards the TN TMDL load reductions is shown in **Figure 6**. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current estimated loading with the implementation of projects. The third bar shows the total allocation for stormwater runoff to meet the TMDL.

TABLE 9: SUMMARY OF PROJECTS COMPLETED IN THE REPORTING PERIOD (DECEMBER 1, 2012 THROUGH NOVEMBER 30, 2013) IN THE IMPERIAL RIVER BASIN

ENTITY	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)
City of Bonita Springs	BS-2	FYN Program	835
City of Bonita Springs	BS-7	Felts Avenue Stormwater Treatment	258
Total	N/A	Total Reductions in Reporting Period	1,093

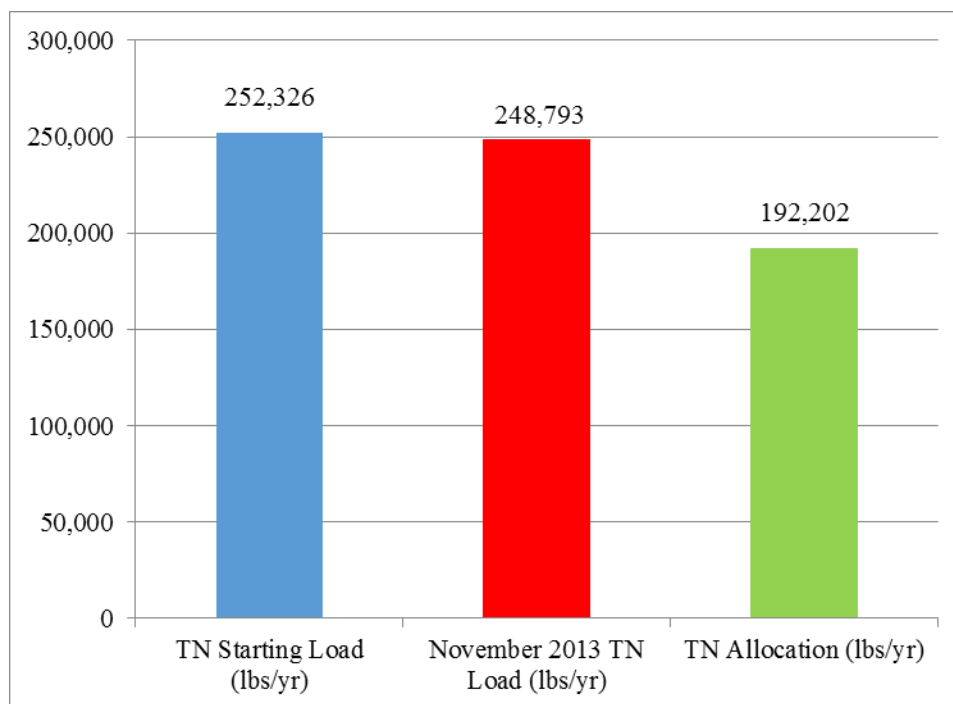


FIGURE 10: PROGRESS TOWARDS THE IMPERIAL RIVER TN TMDL THROUGH NOVEMBER 30, 2013

Section 4: WATER QUALITY MONITORING

The Everglades West Coast BMAP monitoring plan was designed to enhance the understanding of basin loads, identify areas with high nutrient concentrations, and track water quality trends. The information gathered through the monitoring plan will measure progress toward achieving the TMDL and provide a better understanding of the watershed loading. A detailed water quality evaluation will be conducted no later than Years Four of BMAP implementation to determine water quality improvements in the basin from actions included in the first BMAP iteration. All responsible stakeholders participated in the monitoring plan in the first year of BMAP implementation. A few highlights of the monitoring efforts are described below.

4.1 HENDRY CREEK WATER QUALITY MONITORING

Lee County continued monitoring at 14 water quality stations in the basin, and the data are uploaded to the STORET database. In addition, at four of these stations, the Department's South District collected data quarterly.

4.2 IMPERIAL RIVER WATER QUALITY MONITORING

Lee County continued monitoring at five water quality stations in the basin, and the data are uploaded to the STORET database. The City of Bonita Springs continued monitoring at seven water quality stations in the basin, and the data are uploaded to STORET.

APPENDIX A: BMAP PROJECTS

The BMAP project tables below show the implementation status of the BMAP projects as of November 30, 2013. 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.

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TABLE A-1: LEE COUNTY PROJECTS IN HENDRY CREEK BASIN

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	TYPE OF BMP	ACRES TREATED	ESTIMATED COST	STATUS	PROJECT TN REDUCTION (LBS/YR)
LC-1	Lakes Park WQ Restoration	Hydraulic Restoration	1,749	\$3,500,000	Completed	4,533
LC-2	Street Sweeping	Street Sweeping	10,166	N/A	Ongoing	26
LC-3	Education/Fertilizer Ordinance	Ordinances	10,166	N/A	Completed	1,980
LC-4	Island Park Filter Marsh	Hydraulic Restoration	N/A	\$925,000	Completed	TBD
N/A	N/A	N/A	N/A	N/A	Total	6,539

TABLE A-2: FDOT PROJECTS IN THE HENDRY CREEK BASIN

N/A = Not applicable

¹ Projects were listed but had unproved credit.

PROJECT NUMBER	PROJECT NAME	TYPE OF BMP	ACRES TREATED	ESTIMATED COST	STATUS	PROJECT TN REDUCTION (LBS/YR)
HC-FDOT-1	Wet Detention Ponds (1, 2, & 3)	Wet Detention	89	N/A	Completed	105
HC-FDOT-2	Roadside Swales	Swale with Ditch Blocks	N/A	N/A	Completed	N/A
HC-FDOT-3	Street Sweeping	Sweeping	89	N/A	Ongoing	17
HC-FDOT-4	Education/Fertilizer Ordinance	Ordinances	89	N/A	Completed	3
N/A	N/A	N/A	N/A	N/A	Total	125

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TABLE A-3: LEE COUNTY PROJECTS IN THE IMPERIAL RIVER BASIN

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	TYPE OF BMP	ACRES TREATED	ESTIMATED COST	STATUS	PROJECT TN REDUCTION (LBS/YR)
LC-1	CREW	Conservation Purchase	15	N/A	Completed	0
LC-2	Pine Lake Preserve	Conservation Purchase	129	N/A	Completed	1
LC-3	Street Sweeping	Street Sweeping	26,113	N/A	Ongoing	7
LC-4	Imperial Marsh	Conservation Purchase	477	N/A	Completed	1,440
LC-5	Education/Fertilizer Ordinance	Ordinances	26,113	N/A	Completed	6
N/A	N/A	N/A	N/A	N/A	Total	1,454

TABLE A-4: BONITA SPRINGS PROJECTS IN THE IMPERIAL RIVER BASIN

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	TYPE OF BMP	ACRES TREATED	ESTIMATED COST	STATUS	PROJECT TN REDUCTION (LBS/YR)
BS-1	Education/Fertilizer Ordinance	Ordinances	7,154	N/A	Completed	696
BS-2	FYN Program	Ordinances	7,154	N/A	Ongoing	835
BS-3	Old 41 Catch Basin Inserts	Catch Basin Inserts	21	N/A	Completed	5
BS-4	Residential Dry Detention	Dry Detention	4	N/A	Completed	1
BS-5	Morton Avenue Swales	Swale with Raised Inlet	26	N/A	Completed	212
BS-6	Marni Fields	Dry Detention	16	N/A	Completed	6
BS-7	Felts Avenue Stormwater Treatment	Dry Retention	31	N/A	Completed	258
BS-8	Street Sweeping	Street Sweeping	7,154	N/A	Ongoing	45
N/A	N/A	N/A	N/A	N/A	Total	2,058

TABLE A-5: FDOT PROJECTS IN THE IMPERIAL RIVER BASIN

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	TYPE OF BMP	ACRES TREATED	ESTIMATED COST	DEADLINE	PROJECT TN REDUCTION (LBS/YR)
IR-FDOT-1	Wet Detention Ponds (5d, 7C, & 9B)	Wet Detention	96	N/A	Completed	18
IR-FDOT-2	Roadside Swales	Swale with Ditch Blocks	N/A	N/A	Completed	N/A
IR-FDOT-3	Education/Fertilizer Ordinance	Ordinances	96	N/A	Completed	3
N/A	N/A	N/A	N/A	N/A	Total:	21