

2014 PROGRESS REPORT

for the Caloosahatchee Estuary Basin Management Action Plan

prepared by the

Division of Environmental Assessment and Restoration

Water Quality Restoration Program

Florida Department of Environmental Protection

Tallahassee, Florida 32399

in cooperation with the

Caloosahatchee Estuary Stakeholders

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ACKNOWLEDGMENTS

This 2014 Progress Report for the Caloosahatchee Estuary Basin Management Action Plan 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 Caloosahatchee Estuary stakeholders.



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TABLE OF CONTENTS

LIST OF ACRONYMS AND ABBREVIATIONS	V
SUMMARY	VI
SECTION 1 : INTRODUCTION	1
1.1 Purpose of the Report	1
1.2 Total Maximum Daily Loads for the Caloosahatchee Estuary Basin	1
1.3 Responsible Parties and Key Stakeholders.....	3
1.4 BMAP Allocations.....	3
SECTION 2 : ACTIVITIES DURING THE REPORTING YEAR	5
2.1 Activities by Entity	5
2.1.1 Charlotte County.....	5
2.1.2 City of Cape Coral.....	5
2.1.3 City of Fort Myers.....	6
2.1.4 ECWCD.....	6
2.1.5 FDOT District 1.....	10
2.1.6 Lee County	10
2.1.7 Agriculture	17
2.2 Summary of Accomplishments	19
SECTION 3 : WATER QUALITY AND BIOLOGICAL MONITORING	21
3.1 Water Quality Monitoring.....	21
3.2 Biological Monitoring	22
APPENDIX A: BMAP PROJECTS.....	24

LIST OF FIGURES

Figure ES-1: Progress towards the Caloosahatchee TN TMDL through November 30, 2014.....	vii
Figure 1: Caloosahatchee Estuary Basin.....	2
Figure 2: City of Cape Coral FYN Class at Rotary Park, July 25, 2014	5
Figure 3: City of Fort Myers Carrell Canal Water Quality Retrofit	6
Figure 4: ECWCD Wings over Water Festival Speaker.....	7
Figure 5: ECWCD Staff and Volunteers Picking Up Trash at the Great American Cleanup	8
Figure 6: ECWCD Trailer Load of Collected Trash During the Great American Cleanup	9
Figure 7: Rehydrated Wetland in the Mirror Lakes Preserve after ECWCD Pumping.....	9
Figure 8: Lee County Nalle Grade Stormwater Park Concept 6	10
Figure 9: Lee County Watershed Education Training – Ponds, Lakes, and Neighborhoods Workshop, November 2014	12
Figure 10: Lee County Fertilize Smart Campaign Entitled “Don’t Feed the Monster”	13
Figure 11: Lee County UV Light Filter Nitrogen Reduction, Phase II Pilot Project.....	15

Figure 12:	Lee County Habitat Assessment, Caloosahatchee Tributaries, Summer 2014	16
Figure 13:	FDACS' BMP Program Enrollments as of December 2014.....	17
Figure 14:	Progress towards the Caloosahatchee TN TMDL through November 30, 2014.....	20
Figure 15:	Lee County Random Sample Collection, San Carlos Bay, December 2014.....	21

LIST OF TABLES

Table 1:	Caloosahatchee Estuary TMDLs.....	2
Table 2:	Initial Allowable Load Determination	4
Table 3:	Lee County Vegetation Harvested in 2014	11
Table 4:	Lee County Fertilizer Ordinance Compliance and Enforcement Activities.....	13
Table 5:	Lee County Public Education and Outreach Activities.....	14
Table 6:	Agricultural Acreage, BMP Enrollment, and Future Enrollment Goals for the Caloosahatchee Estuary Basin.....	18
Table 7:	Summary of Agricultural Enrollment.....	19
Table 8:	Summary of Projects Completed in the Reporting Period (December 1, 2013– November 30, 2014).....	19
Table 9:	SFWMD Biological Monitoring	22
Table 10:	Department's South District Biological Monitoring.....	23
Table A-1:	Charlotte County Projects	25
Table A-2:	City of Cape Coral Projects.....	25
Table A-2:	City of Fort Myers Projects	26
Table A-3:	ECWCD Projects.....	26
Table A-4:	FDOT Projects.....	27
Table A-5:	Lucaya CDD Projects	27
Table A-6:	Lee County Projects	28
Table A-7:	FDACS' NOI Enrollment Reduction Estimates as of December 2014.....	29

LIST OF ACRONYMS AND ABBREVIATIONS

BMAP	Basin Management Action Plan
BMP	Best Management Practice
CDD	Community Development District
CHNEP	Charlotte Harbor National Estuary Program
CRE	Caloosahatchee River Estuary
Department	Florida Department of Environmental Protection
DO	Dissolved Oxygen
ECWCD	East County Water Control District
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FY	Fiscal Year
FYN	Florida Yards and Neighborhoods (Program)
kg/yr	Kilograms Per Year
lbs/yr	Pounds Per Year
MS4	Municipal Separate Storm Sewer System
NNC	Numeric Nutrient Criteria
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAWP	FDACS' Office of Agricultural Water Policy
PSA	Public Service Announcement
SFWMD	South Florida Water Management District
STORET	STOrage and RETrieval (Database)
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
EPA	United States Environmental Protection Agency
WBID	Waterbody Identification

SUMMARY

TOTAL MAXIMUM DAILY LOADS

The Caloosahatchee River extends from Lake Okeechobee through a series of locks to San Carlos Bay, and has both freshwater and marine segments. The freshwater segment runs from Lake Okeechobee to Franklin Lock (S-79). The marine segment, referred to as the Caloosahatchee Estuary or Tidal Caloosahatchee, extends from Franklin Lock (S-79) to Shell Point. The Caloosahatchee Estuary Basin receives fresh water from S-79 and from various tributaries and canal systems that discharge directly to the estuary below S-79. The basin encompasses portions of Lee County and Charlotte County and areas within the cities of Cape Coral and Fort Myers.

The Florida Department of Environmental Protection identified the Caloosahatchee Estuary as impaired by nutrients (chlorophyll-*a*). In December 2009, the Department adopted the Caloosahatchee Estuary Total Maximum Daily Load for total nitrogen (TN), which is linked to high chlorophyll-*a* concentrations in the Caloosahatchee River and Estuary downstream of the Franklin Lock and Dam.

The Caloosahatchee Estuary Basin Management Action Plan was adopted in November 2012 to implement the TN TMDL in the watershed. This is the second annual Progress Report for the Caloosahatchee Estuary BMAP, and it describes the activities that occurred during the reporting period from December 1, 2013, through November 30, 2014.

SUMMARY OF LOAD REDUCTIONS

During the reporting period, the city of Cape Coral implemented street sweeping in the basin, reducing TN by an estimated 676 pounds per year (lbs/yr). The Florida Department of Transportation (FDOT) increased the annual road miles swept in the basin to 2,992, reducing TN by an additional 473 lbs/yr. Lee County also increased street sweeping in the basin, reducing TN by an additional 220 lbs/yr. The city of Fort Myers completed the Carrell Canal water quality retrofit project, reducing TN by an estimated 1,275 lbs/yr. In addition, the reductions from agricultural best management practice (BMP) implementation were quantified and are estimated at 29,092 lbs/yr of TN. The reductions mentioned above are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 172,201 lbs/yr of TN, or 44.3% of the reductions needed to meet the portion of the TMDL allocated to the Caloosahatchee Estuary Basin. **Figure ES-1** shows progress towards the TN TMDL load reductions.

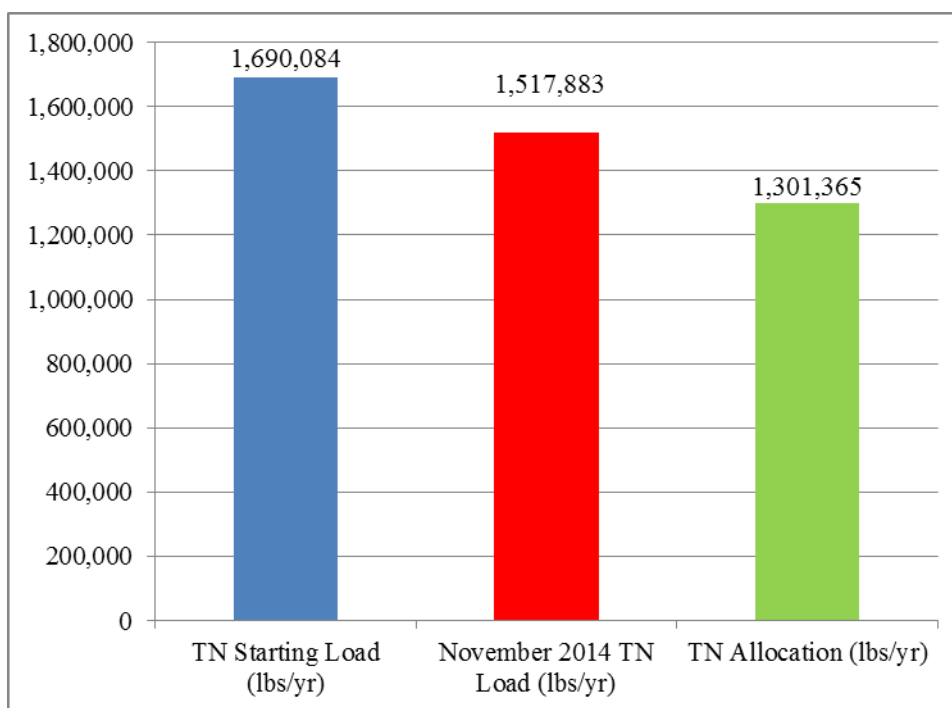


FIGURE ES-1: PROGRESS TOWARDS THE CALOOSAHATCHEE TN TMDL THROUGH NOVEMBER 30, 2014

WATER QUALITY AND BIOLOGICAL MONITORING

The city of Cape Coral, city of Fort Myers, Lee County, and the Department's South District continued water quality monitoring consistent with the BMAP monitoring plan. The South Florida Water Management District (SFWMD) continued monitoring all of the stations in the BMAP monitoring plan, as well as one additional station (CES02, Caloosahatchee Waterway Marker 2). In addition, the SFWMD conducted biological sampling for oysters and seagrass, and the Department's South District continued quarterly sampling for seagrass.

Section 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the second annual Progress Report for the Caloosahatchee Estuary Basin Management Action Plan. **Section 2** describes the activities that occurred during the period from December 1, 2013, through November 30, 2014. **Section 3** describes the water quality and biological monitoring that occurred during the reporting period.

1.2 TOTAL MAXIMUM DAILY LOADS FOR THE CALOOSAHATCHEE ESTUARY BASIN

The Caloosahatchee River extends from Lake Okeechobee through a series of locks to San Carlos Bay, and has both freshwater and marine segments. The freshwater segment is from Lake Okeechobee to Franklin Lock (S-79). The marine segment, referred to as the Caloosahatchee Estuary or Tidal Caloosahatchee, extends from S-79 to Shell Point, adjacent to San Carlos Bay, with Pine Island Sound to the northwest and Estero Bay to the southeast. The Caloosahatchee Estuary Basin receives fresh water from S-79 and from various tributaries and canal systems that discharge directly to the estuary below S-79. The basin encompasses portions of Lee County and Charlotte County and areas within the cities of Cape Coral and Fort Myers (see **Figure 1**). Approximately 75% of the Tidal Caloosahatchee watershed is located in Lee County, with the remaining 25% in Charlotte County.

The Florida Department of Environmental Protection identified the Caloosahatchee Estuary as impaired by nutrients (chlorophyll-*a*). In December 2009, the Department adopted the Caloosahatchee Estuary TMDL for total nitrogen (TN), which is linked to high chlorophyll-*a* concentrations in the Caloosahatchee River and Estuary downstream of Franklin Lock and Dam. The Caloosahatchee Estuary BMAP includes the three segments with waterbody identification (WBID) numbers that make up the tidal Caloosahatchee River: WBIDs 3240A, 3240B, and 3240C. **Table 1** lists the TMDL and pollutant load allocations adopted by rule for the watershed (based on updates to the loading to the watershed).

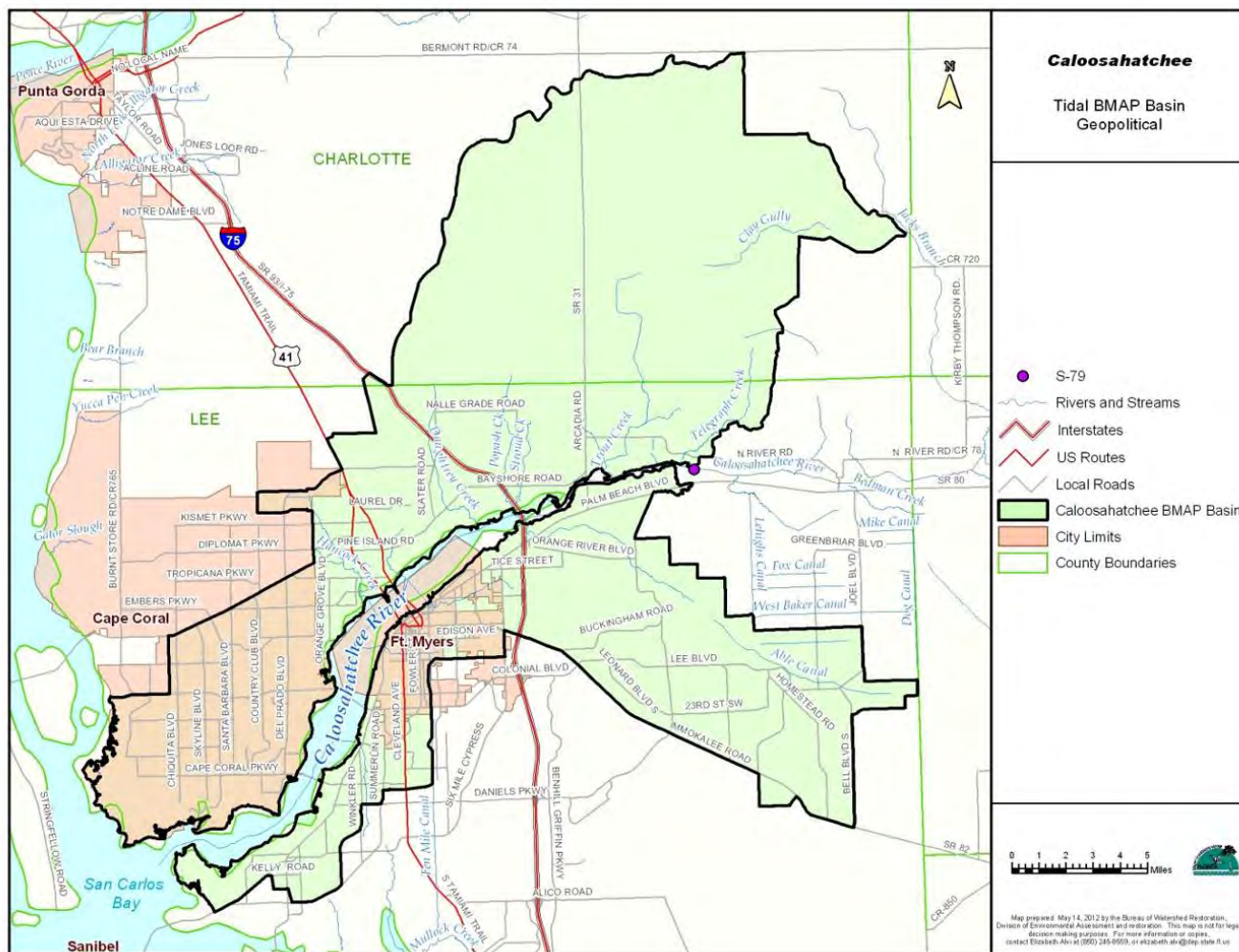


FIGURE 1: CALOOSAHATCHEE ESTUARY BASIN

TABLE 1: CALOOSAHATCHEE ESTUARY TMDLS

¹ Domestic wastewater treatment plant and stormwater loads have been updated since the original TMDL report.

² The TMDL load applies only to stormwater loads and is based on loads that have been updated since the original TMDL.

lbs/yr = Pounds per year; NPDES = National Pollutant Discharge Elimination System

PARAMETER	WASTELOAD ALLOCATION FOR WASTEWATER (LBS/YR)	CURRENT DOMESTIC WASTEWATER LOADING (LBS/YR) ¹	WASTELOAD ALLOCATION FOR NPDES STORMWATER (% REDUCTION)	LOAD ALLOCATION (% REDUCTION)	CURRENT STORMWATER LOADING (LBS/YR) ¹	TMDL LOAD (LBS/YR) ²
TN	Permitted loads	64,158	23%	23%	1,690,084	1,301,365

1.3 RESPONSIBLE PARTIES AND KEY STAKEHOLDERS

The following organizations and entities are key stakeholders with assigned load reductions in the Caloosahatchee Estuary BMAP:

- Agriculture.
- Charlotte County.
- City of Cape Coral.
- City of Fort Myers.
- East County Water Control District (ECWCD).
- Florida Department of Transportation (FDOT) District 1.
- Lee County.
- Lucaya Community Development District (CDD).

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

1.4 BMAP ALLOCATIONS

BMAP stakeholders determined that assigning detailed allocations was the best approach for achieving the TMDL reductions. The TMDL did not include detailed allocations for the wastewater treatment facilities in the basin; therefore, the BMAP only assigned detailed allocations for the stormwater sources in the Tidal Caloosahatchee Basin. Scenarios that were simulated during TMDL development (existing conditions, TMDL, and background) were used to determine allocations. The background condition scenario simulated loading to the estuary after all developed land uses were changed back to natural conditions (wetland and upland forests) and combined with a flow from Lake Okeechobee at the target nutrient levels established by the Lake Okeechobee phosphorus TMDL. The TMDL run simulated the condition in the estuary where light attenuation in the target area (San Carlos Bay) is at a level consistent with maintaining healthy seagrass growth at a depth of 2.2 meters. A comparison of the existing condition with the TMDL and background conditions, as well as previous research in the estuary, demonstrated a required 23% TN load reduction. This meant reducing the TN load by 388,719 lbs/yr, and this load reduction was allocated based on each stakeholder's percentage of the developed load.

The load reductions were allocated to each stakeholder based on the percentage of the current developed lands shown in **Table 2**. It should be recognized that the results of this process are based on the original TMDL modeling, which is expected to be refined as part of the updated modeling performed in the near future. These values do not, therefore, represent final allocations but rather an initial application of the allocation process.

TABLE 2: INITIAL ALLOWABLE LOAD DETERMINATION

ENTITY	ALLOWABLE LOAD BY PERCENT NONBACKGROUND (LBS/YR)	BACKGROUND + ALLOWABLE NONBACKGROUND LOAD (LBS/YR)	LOAD REDUCTION (LBS/YR)
Agriculture	21,224	230,557	55,597
Charlotte County	360	232,047	943
City of Cape Coral	39,478	224,811	103,414
City of Fort Myers	15,623	117,623	40,924
ECWCD	14,405	121,072	37,736
FDOT	3,481	14,815	9,119
Lee County	53,770	359,770	140,853
Lucaya CDD	51	671	132
TOTAL	148,391	1,301,365	388,719

Section 2: ACTIVITIES DURING THE REPORTING YEAR

Section 2.1 and **Section 2.2** describe the accomplishments over the past year. The individual project tables are included in **Appendix A**, and **Section 2.1** contains photographs of project implementation efforts.

2.1 ACTIVITIES BY ENTITY

2.1.1 CHARLOTTE COUNTY

Charlotte County continued BMAP efforts through educational activities, including a fertilizer ordinance and the distribution of pamphlets.

2.1.2 CITY OF CAPE CORAL

City of Cape Coral staff made 17 presentations related to the Florida Yards and Neighborhoods (FYN) Program and illicit discharge awareness, reaching approximately 800 people with these talks (see **Figure 2**). The city continues to provide information through a website, which has received over four thousand hits on these topics. Street sweeping continues in Cape Coral in the downtown area, alleys, and commercial corridors.



FIGURE 2: CITY OF CAPE CORAL FYN CLASS AT ROTARY PARK, JULY 25, 2014

2.1.3 CITY OF FORT MYERS

Construction was completed on the city of Fort Myers Carrell Canal Water Quality Retrofit Project (Project FM-11) (see **Figure 3**), which received TMDL grant funding from the Department. The project includes two detention areas and five filter marshes, as well as the renovation of the existing golf course in the area. Construction on the project began in July 2014 and was completed in October 2014. The project reduced TN loading by an estimated 1,275 lbs/yr.



FIGURE 3: CITY OF FORT MYERS CARRELL CANAL WATER QUALITY RETROFIT

2.1.4 ECWCD

ECWCD provides public outreach/education to its residents and has created and implemented several programs, projects, and initiatives. ECWCD held the third annual Wings over Water Festival on Friday, February 28 and Saturday, March 1, 2014, at Harns Marsh (see **Figure 4**). This environmental education event brings agencies and organizations together with the common goal of connecting residents with the outdoors and sharing environmental messages and programs. For 2014, new sponsors were added, and there was increased media coverage of the event. ECWCD received \$4,500 (in-kind) in print advertisements from the *News-Press* for the event, including stories in the *Lehigh Acres NewsStar* and *Lehigh Acres Citizen*, as well as other coverage. More than 300 participants attended.

During the reporting period, ECWCD distributed approximately 3,000 brochures, bookmarks, and magnets educating the public on the importance of preventing stormwater pollution and conserving water.



FIGURE 4: ECWCD WINGS OVER WATER FESTIVAL SPEAKER

Additional community outreach events from December 1, 2013, through November 30, 2014, included the following:

1. **East Lee County High School Event, January 2014** – Field trip with Advanced Placement Environmental Sciences class to Harns Marsh and Jim Fleming Ecological Park.
2. **Lehigh Acres Spring Festival Parade, March 22, 2014** – ECWCD staff entered a float in the annual spring festival parade with a theme of “Conserve, Preserve, Protect,” which focused on the proper use of fertilizers.
3. **The Great American Cleanup Effort** – ECWCD staff partnered with the Sheriff’s Office and Lehigh Acres Community Initiative to focus on a canal cleanout effort in the Leonard area. Staff provided cleanup in this area during normal service times (see **Figure 5** and **Figure 6**).

4. **All-terrain vehicle impacts brochure** – ECWCD formed a partnership with the Sheriff's Office of Lee and Hendry Counties and neighboring property owners at Halfway Pond. A joint brochure was created and disseminated, educating individuals on the negative impacts of all-terrain vehicle use in and around sensitive district lands.
5. **The following presentations:**
 - a. Rotary Club of Lehigh Acres Infrastructure Update, May 15, 2014.
 - b. Headwaters Meeting Infrastructure Update, May 15, 2014.
 - c. Lehigh Acres Community Council, June 16, 2014.
 - d. Headwaters Meeting Infrastructure Update, August 7, 2014.
 - e. Greater Lehigh Acres Chamber of Commerce, August 26, 2014.
 - f. Approximately 400 students in Grades 1 through 4 at the Sunshine Elementary School listened to a presentation on ECWCD's operations and environmental impacts.



FIGURE 5: ECWCD STAFF AND VOLUNTEERS PICKING UP TRASH AT THE GREAT AMERICAN CLEANUP



FIGURE 6: ECWCD TRAILER LOAD OF COLLECTED TRASH DURING THE GREAT AMERICAN CLEANUP

To date, ECWCD has pumped 1,864.17 acre-feet of stormwater out of its canal system that would have eventually made its way to the Caloosahatchee River. This pumped water helped rehydrate a 346-acre natural wetland located in the Mirror Lakes Preserve (see **Figure 7**).



FIGURE 7: REHYDRATED WETLAND IN THE MIRROR LAKES PRESERVE AFTER ECWCD PUMPING

2.1.5 FDOT DISTRICT 1

FDOT District 1 continued to implement a stormwater education program, which includes stormwater pamphlet distribution, stormwater education, illicit discharge inspections, and training for FDOT staff and contractors. The district also continued to implement street sweeping throughout Lee County and the Caloosahatchee Basin. In addition, FDOT started the statewide implementation of mandatory illicit discharge detection and elimination training for all staff and contractors working in FDOT's rights-of-way. Nitrogen reductions for the current reporting period are reflected in **Appendix A**.

2.1.6 LEE COUNTY

Lee County's Nalle Grade Stormwater Park Project is in the Phase I stage of development, design, and permitting. The county's consultant developed six conceptual designs for the park, and county engineering staff reviewed and selected Concept #6 (see **Figure 8**) based on the nutrient reduction and cost-benefit analyses. The estimated load removal for Concept #6 is 1,127.51 kilograms per year (kg/yr) TN and 162.37 kg/yr total phosphorus (TP). The budget is awaiting approval from the Board of County Commissioners, after which the county plans to move forward with permitting and construction for the project.

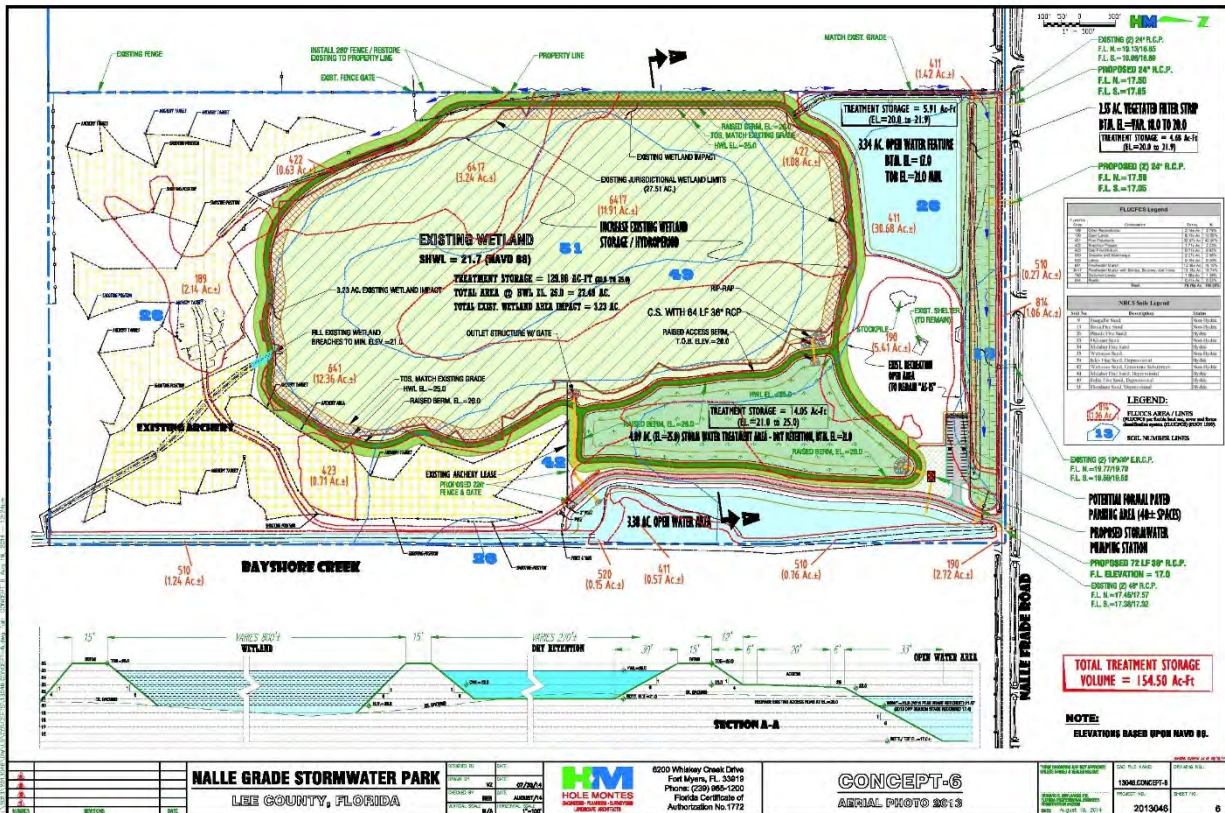


FIGURE 8: LEE COUNTY NALLE GRADE STORMWATER PARK CONCEPT 6

Several vegetation harvesting maintenance events were conducted in 2014. **Table 3** lists the total amount of vegetation harvested for each project during all events in 2014.

TABLE 3: LEE COUNTY VEGETATION HARVESTED IN 2014

PROJECT	AMOUNT HARVESTED (CUBIC YARDS)
Powell Creek Extension	80
Powell Creek Filter Marsh	90
Powell Creek Filter Marsh	50
Popash Creek Preserve Filter Marsh	200

The Lee County Department of Transportation continued its street sweeping program and recycled 294.5 tons of street sweepings in the Tidal Caloosahatchee watershed during Fiscal Year (FY) 2013/2014.

Five Watershed Education Training – Ponds, Lakes, and Neighborhoods workshops were held during the reporting period, with a total of 325 homeowners in attendance (see **Figure 9**). Through this program, 367 educational handouts were distributed and a [website](#) was created that includes educational materials and announcements for workshops held in the Caloosahatchee Estuary watershed. Public outreach initiatives included partnerships with the Charlotte Harbor National Estuary Program (CHNEP), neighboring municipalities, Lee County Hyacinth Control District, local private consulting firms, SFWMD, Lee County Extension Services, Florida Native Plant Society volunteers, Florida Gulf Coast University, CDDs, homeowner associations, and volunteer homeowner groups. These initiatives educated residents on stormwater pollution prevention, with an emphasis on impacts to neighborhood ponds and issues pertaining to pond management. In some cases, the initiatives focused on gaining homeowner consensus for participation in pilot projects to implement water quality best management practices (BMPs).



FIGURE 9: LEE COUNTY WATERSHED EDUCATION TRAINING – PONDS, LAKES, AND NEIGHBORHOODS WORKSHOP, NOVEMBER 2014

CHNEP is currently seeking grant funding to expand educational initiatives and develop a fund to help homeowner associations install water quality improvement BMPs in their neighborhood lakes and ponds. In addition, the Watershed Education Training – Ponds, Lakes, and Neighborhoods curriculum supports the level of detail required for Lee County Extension Services to be able to offer continuing education units for professionals who participate in the workshops, expanding interest in the workshops and increasing attendance.

Through the Citizen's Stormwater Academy, staff provided presentations with visual examples of stormwater pollution and how pollution affects individuals personally. Facts were provided about the watersheds, and brochures were distributed containing information about pollution prevention and contact information for reporting pollution issues. Training was provided on how to identify and report pollution issues, and training, assistance, and materials on how to mark storm drains were made available. Materials for this public education initiative were funded in partnership with CHNEP and delivered by Lee County staff to the county's NPDES co-permittee drainage districts.

In addition to a curriculum delivered by staff, neighborhood stewardship activities included marking storm drains to raise awareness and conducting follow-up visits to help concerned citizens troubleshoot pollution issues in their neighborhoods. Materials made available to complement the Citizen's Stormwater

Academy curriculum included a custom “frequently asked questions” sheet entitled “Choices Matter.” Other materials included water drop-shaped refrigerator magnets that list contact information for reporting stormwater system problems to Lee County Natural Resources and the Department of Transportation, and storm drain-marking materials. There have also been requests for additional monthly scheduling of workshops from Lee County’s co-permittees.

Lee County rolled out an updated Fertilize Smart campaign entitled “Don’t Feed the Monster,” including an updated [website](#), a [Facebook site](#), brochure materials, and a public service announcement (PSA) [video](#) featuring “The Slime Monster” (see **Figure 10**).



FIGURE 10: LEE COUNTY FERTILIZE SMART CAMPAIGN ENTITLED “DON’T FEED THE MONSTER”

Lee County also continued compliance and enforcement activities (**Table 4**) for the county fertilizer ordinance. **Table 5** summarizes Lee County’s public education and outreach activities.

TABLE 4: LEE COUNTY FERTILIZER ORDINANCE COMPLIANCE AND ENFORCEMENT ACTIVITIES

COMPLIANCE ACTIVITY	NUMBER OF INSPECTIONS
Compliant with Ordinance	26
Warning of Noncompliance	7
Written Citation of Noncompliance (with Fine)	16
TOTAL INSPECTIONS FROM 12/2013 TO 11/2014	49

TABLE 5: LEE COUNTY PUBLIC EDUCATION AND OUTREACH ACTIVITIES

N/A – Not applicable; FFL – Florida-friendly landscaping

CATEGORY	TOTAL 2013	FYN 2014	FFL 2014	TOTAL 2014
Estimated Percentage of Population Reached by Activities in Total	5%	5%	15%	5%
Brochure/Flyers/Fact Sheets Distributed	14,000	3,632	96,000	99,632
Newspaper/Magazine Articles Published/Distributed	N/A	N/A	35	35
Newspaper/Magazine Readers (actual and online)	N/A	N/A	210,000	210,000
Neighborhood Presentations: Number of Participants	5,800	1,721	2,904	4,625
Neighborhood Presentations: Number Conducted	55	22	54	72
Public Displays (e.g., kiosks, storyboards, posters, etc.)	22	16	8	24
Radio or Television PSAs	2	1	5	6
YouTube Views	N/A	N/A	121,831	121,831
School Presentations: Number of Participants	18	221	0	221
Seminars/Workshops: Number of Participants	15,200	789	3,100	3,889
Special Events: Number Conducted	8	3	1	4
Special Events: Numbers of Participants	8,200	2,300	4,000	6,300
Website: Number of Hits/Visitors to Stormwater-Related Pages	79,000	87,000	250,000	337,000

In the fall of 2014, Lee County concluded a study that determined the effectiveness of ultraviolet (UV) light as a treatment BMP for denitrification. A pilot system (see **Figure 11**) was installed in a trailer located upstream of the S-79 lock, near the Olga Water Treatment Plant in Lee County. The pilot system consisted of an intake unit that pumped water into the trailer from the Caloosahatchee (feed water), a Trojan UV light reactor, and two columns with lime rock substrate—one that contained aerobic bacteria and one carbon substrate included in anoxic conditions. Supplemental air was supplied to Column 1 to enhance nitrification, while lower dissolved oxygen (DO) conditions were maintained in Column 2 to encourage denitrification. Samples were collected at four locations: feed water, post-UV filter, after Column 1, and after Column 2. Field parameters were measured on site. Lee County Natural Resources expects to publish the results of this study in 2015.



FIGURE 11: LEE COUNTY UV LIGHT FILTER NITROGEN REDUCTION, PHASE II PILOT PROJECT

During the reporting period, Lee County Natural Resources partnered with FDACS to identify commercial agricultural producers not yet enrolled in FDACS' BMP Program in the Trout Creek/East Lee County portion of the Caloosahatchee Estuary watershed. This was an effort to address the United States Environmental Protection Agency (EPA) Trout Creek TMDL and was a requirement of the associated NPDES permit. County staff recognized the need to partner in this area due to the lack of a land or municipal separate storm sewer system (MS4) management role that would address the majority of the watershed runoff. This partnership has also led to other discussions of smaller-scale projects and educational initiatives that Lee County may consider adapting in the future to address fecal coliform and nutrient pollution sources in agricultural/rural land preserve areas.

Lee County Natural Resources staff have been meeting monthly to discuss data analysis done offline to characterize and prioritize watersheds for capital improvement planning and budgeting. Various criteria are used, including the following:

- Impairment, BMAP, or TMDL status.
- Annual geometric mean TN values and their percent exceedance over the new numeric nutrient criteria (NNC).
- Habitat assessment (see **Figure 12**).

The prioritization of watersheds has been used in mapping exercises to identify vacant lands that could be potential sites for stormwater improvement projects. Over the last year, 42 vacant parcels were identified for potential water quality project sites in the Caloosahatchee watershed.



FIGURE 12: LEE COUNTY HABITAT ASSESSMENT, CALOOSAHATCHEE TRIBUTARIES, SUMMER 2014

2.1.7 AGRICULTURE

FDACS currently has five field staff in the SFWMD region who work with producers on BMP enrollment and implementation. Some of FDACS' activities include initial enrollment, follow up to provide technical assistance, BMP implementation assurance visits, the management of water quality- and water supply-related projects and contracts, and coordination with the SFWMD on agriculture-related permitting questions. Staff also participate in the development of the various BMAPs in the region.

Landowners who sign Notices of Intent (NOIs) agree to implement applicable BMPs on their enrolled properties. As of December 31, 2014, FDACS had enrolled 65,998.03 acres in BMPs (**Table 6**) based on the entire parcel acreage.

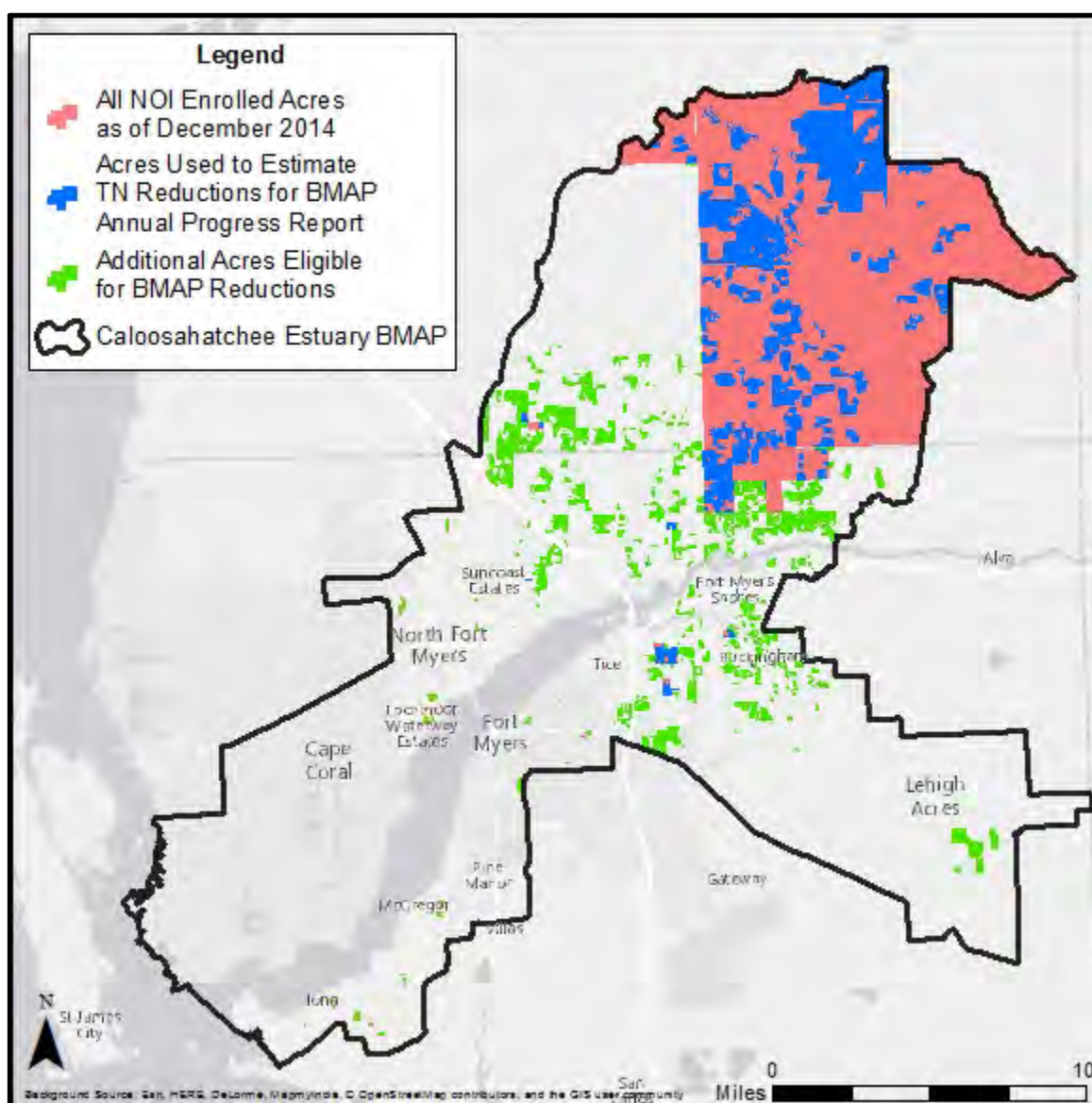


FIGURE 13: FDACS' BMP PROGRAM ENROLLMENTS AS OF DECEMBER 2014

The acreage enrolled under the cow/calf BMP manual exceeds the total acreage identified as pasture in the 2004 SFWMD land use coverage. This exceedance is due to the inclusion of the entire Babcock Ranch property parcel, which includes nonagricultural as well as agricultural areas. The Department will work with FDACS to identify which lands on the Babcock Ranch property are in production and will update the estimated load reductions associated with BMP implementation in the next Progress Report. In the next BMAP iteration, the acreages assigned to various land uses will be adjusted to account for the agricultural activities on this property.

TABLE 6: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE CALOOSAHATCHEE ESTUARY BASIN

¹ FDACS staff-adjusted acreage for the 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 dairy operations in the BMAP area, and this was confirmed by FDACS' Division of Animal Industry.

³ Acreage enrolled as part of the Babcock Ranch cow/calf operation was not classified as agricultural land use in the 2004 land use coverage.

Note: Figures do not include forestry or aquaculture.

N/A – Not applicable.

2004 SFWMD LAND USE	2004 ACRES	FDACS-ADJUSTED ACRES FOR ENROLLMENT ¹	RELATED FDACS' BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIS
Pasture (2100, 2110, 2120, 2130)	29,890.2	28,981.2	Cow/Calf, Future (Hay)	65,196.3 ³	6
Row/Field/Mixed Crops	6,081.9	6,041.3	Vegetable/Agronomic Crops	120.0	1
Sod	N/A	N/A	Sod	453.6	1
Fallow Cropland	1,499.3	N/A	N/A	N/A	N/A
Horse Farm	24.3	24.3	Future Equine	N/A	N/A
Citrus	817.7	359.1	Ridge Citrus, Flatwoods Citrus	19.1	1
Abandoned Groves	0.0	N/A	No Enrollment Needed	N/A	N/A
Fruit Orchards/Other Groves	154.1	154.1	Specialty Fruit and Nut	0.0	0
Tree Nurseries	230.3	230.3	Future Nursery, Specialty Fruit and Nut	0.0	0
Ornamentals	285.1	285.1	Container Nursery	209.0	22
Specialty Farms	67.2	67.2	Conservation Plan Rule	0.0	0
Dairies ²	37.9	37.9	Conservation Plan Rule	0.0	0
TOTAL	39,088.0	36,181	N/A	65,998	31

Applicable agricultural operations for BMP enrollment include citrus, cropland, improved pasture, and tree crops. According to 2004 land use data, these comprise about 30,048 acres within the BMAP boundary. When looking at the portion of the enrolled acreage associated with these agricultural land uses, a total of 17,724 acres was enrolled as of December 2014. The BMPs implemented on this acreage result in estimated reductions of 29,092 lbs/yr of TN (**Table 7**). Not all of the acreage listed as agriculture in **Table 6** is included in enrollment calculations, because the NOIs only document the estimated total number of acres on which applicable BMPs are implemented, not the land use acreage mapped as agriculture. Land use data can contain nonproduction acres (such as buildings, parking lots, and fallow

acres) that will not be used in BMAP reduction calculations. There also may be acreage that is not appropriate for enrollment in FDACS' Office of Agricultural Water Policy (OAWP) BMPs, such as lands not in commercial production.

TABLE 7: SUMMARY OF AGRICULTURAL ENROLLMENT

CATEGORY	ACRES
Total Agricultural Acres in BMAP	30,049
Enrolled Acres Used for TN Reduction Estimates	17,724
Remaining Acres To Enroll	12,325

2.2 SUMMARY OF ACCOMPLISHMENTS

Table 8 summarizes the projects completed during the second annual BMAP reporting period. The city of Cape Coral added street sweeping to its projects, and FDOT and Lee County increased street sweeping in the basin. The city of Fort Myers completed a stormwater quality retrofit project. In addition, the reductions from agricultural BMP implementation were quantified based on agricultural land uses in the 2004 SFWMD coverage; the reductions are 29,092 lbs/yr of TN. The projects resulted in an estimated reduction of 31,736 lbs/yr of TN. These reductions are in addition to those projects given credit before BMAP adoption. Therefore, the total reductions to date are 172,201 lbs/yr of TN, or 44.3% of the reductions needed to meet the portion of the TMDL allocated to the Caloosahatchee Estuary Basin.

TABLE 8: SUMMARY OF PROJECTS COMPLETED IN THE REPORTING PERIOD (DECEMBER 1, 2013–NOVEMBER 30, 2014)

N/A = Not applicable

ENTITY	PROJECT NUMBER	PROJECT NAME	TN REDUCTION (LBS/YR)
Cape Coral	CC-2	Street Sweeping	676
FDOT	FDOT-4	Street Sweeping – New Reductions	473
Fort Myers	FM-11	Carrell Canal Water Quality Retrofit	1,275
Lee County	LC-16	Street Sweeping – New Reductions	220
Agriculture	N/A	Agricultural BMPs	29,092
TOTAL	N/A	TOTAL REDUCTIONS IN REPORTING PERIOD	31,736

Figure 14 shows the progress towards the TN TMDL load reductions. The first bar shows the starting load for urban and agricultural stormwater runoff. The second bar shows the current estimated loading based on those projects shown as completed in the BMAP, those completed as part of the *2013 Progress Report*, and those listed above. The third bar shows the total allocation for stormwater runoff to meet the TMDL.

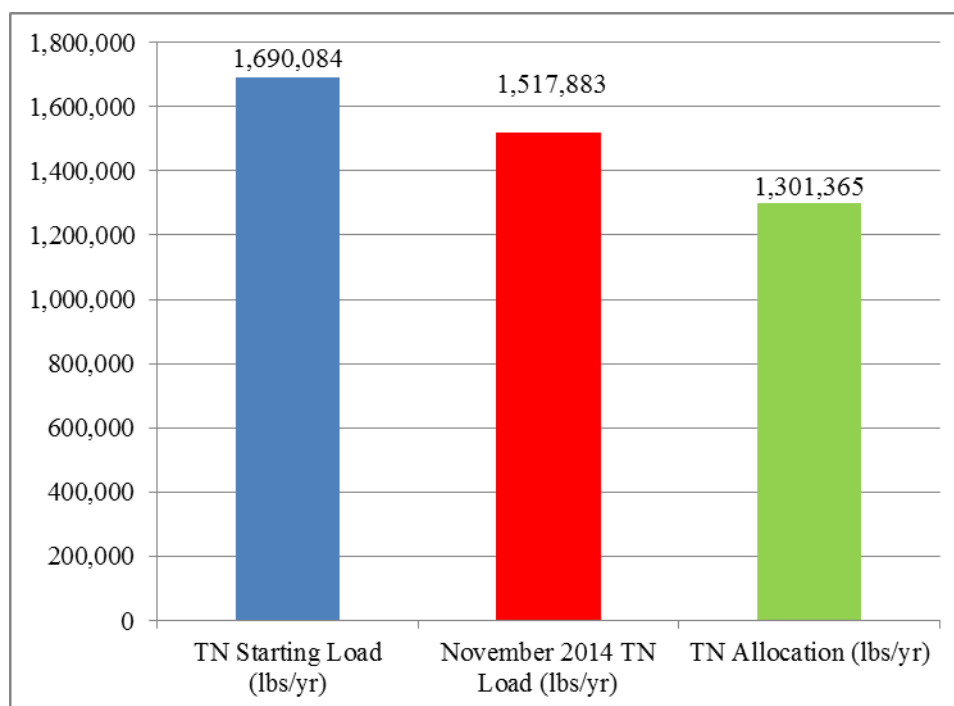


FIGURE 14: PROGRESS TOWARDS THE CALOOSAHATCHEE TN TMDL THROUGH NOVEMBER 30, 2014

Section 3: WATER QUALITY AND BIOLOGICAL MONITORING

The Caloosahatchee Estuary 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 watershed loading. The BMAP monitoring plan consists of ambient water quality sampling and biological monitoring. All responsible stakeholders participated in the monitoring plan in the second year of BMAP implementation. A few highlights of the BMAP monitoring efforts are described below.

3.1 WATER QUALITY MONITORING

The city of Cape Coral continued water quality monitoring in the basin, and has been uploading the data to the Florida Storage and Retrieval (STORET) database. The city of Fort Myers continued water quality monitoring in the basin; however the results are not yet uploaded to STORET. The city of Fort Myers is working with a subcontractor to get any missing data into STORET as soon as possible. Lee County continued water quality monitoring in the basin, and the data have been uploaded to STORET **Figure 15**.



FIGURE 15: LEE COUNTY RANDOM SAMPLE COLLECTION, SAN CARLOS BAY, DECEMBER 2014

SFWMD continued monitoring at 11 stations in the BMAP area. The Department’s South District has also continued water quality monitoring at 15 stations in the basin.

In addition, Lee County, the city of Fort Myers, the city of Cape Coral, ECWCD, Lucaya CDD, and FDOT District 1 are regulated under Phase I MS4 permits, for which they submit monitoring data and analyses to the Department annually. Charlotte County is regulated under a Phase II MS4 permit.

3.2 BIOLOGICAL MONITORING

SFWMD continued biological sampling for oysters and seagrass. Seagrass monitoring continued at all seven sites, but the sampling frequency has been updated, as shown in **Table 9**. Monitoring is focused between March and September, and two sites are also monitored in December. Oyster density at all four sites is monitored monthly.

The Department’s South District continues to carry out quarterly monitoring of seagrass in the basin at the stations listed in **Table 9**.

TABLE 9: SFWMD BIOLOGICAL MONITORING

¹ Twenty haphazardly generated points in the upper Caloosahatchee River Estuary (CRE). Points are generated monthly dependent on the previous month’s results.

² Three-meter x three-meter quadrant divided into nine square-meter quadrants.

PROJECT	STATION NAME	SAMPLING FREQUENCY
Estuary Patch Scale Seagrass Monitoring	Upper CRE1	March, May, July, and September- 20 Quadzilla ²
Estuary Patch Scale Seagrass Monitoring	CRE_2	March, April, May, June, July, August, September, and December-30 Quads
Estuary Patch Scale Seagrass Monitoring	CRE_4	March, May, July, and September-30 Quads
Estuary Patch Scale Seagrass Monitoring	CRE_5	March, May, July, and September-30 Quads
Estuary Patch Scale Seagrass Monitoring	CRE_6B	March, May, July, and September-30 Quads
Estuary Patch Scale Seagrass Monitoring	CRE_7	March, May, July, and September-30 Quads
Estuary Patch Scale Seagrass Monitoring	CRE_8	March, April, May, June, July, August, September, and December-30 Quads
Oyster Monitoring	Pepper Tree Pointe	Monthly
Oyster Monitoring	Iona Cove	Monthly
Oyster Monitoring	Bird Island	Monthly
Oyster Monitoring	Kitchel Key	Monthly

TABLE 10: DEPARTMENT’S SOUTH DISTRICT BIOLOGICAL MONITORING

PROJECT	STATION NAME	SAMPLING FREQUENCY
Seagrass Monitoring	CR02	Quarterly
Seagrass Monitoring	CR04	Quarterly
Seagrass Monitoring	CR05	Quarterly
Seagrass Monitoring	SC03	Quarterly
Seagrass Monitoring	MP04	Quarterly
Seagrass Monitoring	MP05	Quarterly

APPENDIX A: BMAP PROJECTS

The BMAP project tables below show the implementation status of the BMAP projects as of November 30, 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 to meet its 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 period.

TABLE A-1: CHARLOTTE COUNTY PROJECTS

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
CH-1	Education Efforts	Fertilizer ordinance, pamphlets	Ongoing	52

Total Projects Reduction = 52 lbs/yr

TABLE A-2: CITY OF CAPE CORAL PROJECTS

¹ Projects were listed but had unproved credit.

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
CC-1	Education Efforts	FYN, landscaping ordinance, irrigation ordinance, fertilizer ordinance, pet waste ordinance, pamphlets, PSAs, website, illicit discharge program	Ongoing	15,429
CC-2	SE-1 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-3	SW-1 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-4	SW-2 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-5	SW-3 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-6	SW-4 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-7	SW-5 Swale/Inlet Replacement	Installed raised inlets to provide additional water quality in roadside swales	Completed	0 ¹
CC-8	SE Pipe Replacement	SE pipe replacement	Completed	0 ¹
CC-9	Unit 23-SE 8 th Street Drainage	Unit 23-SE 8 th street drainage	Completed	0 ¹
CC-10	Freshwater Canal Detention	Regulation of freshwater canals through existing control structures	Completed	4,769
CC-11	Freshwater Canal Irrigation	Pump stormwater stored in canals into irrigation supply network	Completed	11,507
CC-12	Weir #6 Elevation/Basin 12	Installed riser on weir in freshwater canal system that provides additional retention volume in canals	Completed	7,597
CC-13	Weir #1 Elevation/Basin 15	Installed riser on weir in freshwater canal system that provides additional retention volume in canals	Completed	8,184
CC-14	Street Sweeping	Street sweeping of downtown area, alleys, and commercial roads	Ongoing	676

Total Projects Reduction = 48,162 lbs/yr

TABLE A-2: CITY OF FORT MYERS PROJECTS

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
FM-1	Manuels Branch Watershed Imp.	Exfiltration trenches	Completed	836
FM-2	Education Efforts	FYN, fertilizer ordinance, pamphlets, PSAs, website, illicit discharge program	Ongoing	2,101
FM-3	Utility & Streetscape Improvements	Installation of Stormceptors™	Completed	40
FM-4	Manuels Branch Siltation Structures	Installation of siltation structure designed to receive incoming flow, reduce its velocity, and allow for settling of suspended particles.	Completed	1,078
FM-5	Manuels Branch Control Structures	Series of two weirs constructed along Manuel's Branch between Royal Palm Avenue and Grand Avenue that act as detention structures to increase storage and attenuation in canal	Completed	2,202
FM-6	Billy's Creek Wetland	Billy Creek filter marsh park	Completed	4,025
FM-7	Brookhill Utility Drainage Improvement	Installation of nutrient baffle boxes	Completed	11
FM-8	Street Sweeping	Four zones swept at varying frequencies based on pollutant accumulation	Ongoing	2,582
FM-9	Ford Street Preserve	Constructed wetland treatment system to remove pollutants from Ford Street Canal, which serves 811 acres of highly urbanized watershed	Future	7,293
FM-10	Riverfront Development Phase 1	Wet detention	Completed	90
FM-11	Carrell Canal Water Quality Retrofit	Two detention areas, five filter marshes, and golf course renovation	Completed	1,275

Total Projects Reduction = 21,533 lbs/yr

TABLE A-3: ECWCD PROJECTS

N/A – Not applicable

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
EC-1	Education/Fertilizer	N/A	Ongoing	1,646
EC-2	Freshwater Canal Detention	Regulation of freshwater canals through existing control structures	Completed	7,940
EC-3	Weir Elevation Improvements	Replacement of weir structures at increased control elevations to provide additional attenuation	Completed	7,543
EC-4	Harn's Marsh Phases I & II	Replacement of weir structures and redirection of flows into filter marsh	Completed	4,682
EC-5	Jim Flemming Eco-Park	Wetland rehydration and treatment	Completed	N/A
EC-6	Mirror Lake Phase I	Detention pond	Completed	1,357

Total Projects Reduction = 23,168 lbs/yr

TABLE A-4: FDOT PROJECTS

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
FDOT-1	Existing Stormwater Dry Ponds	Dry detention	Completed	55
FDOT-2	Discontinuing Fertilization	No longer fertilizing rights-of-ways in watershed	Completed	1,941
FDOT-3	Education Efforts	Pamphlets, PSAs, illicit discharge program	Ongoing	232
FDOT-4	Street Sweeping	2,992 pavement miles swept annually	Ongoing	944
FDOT-5	Ditch Blocked Swales	Swales with ditch blocks	Completed	826
FDOT-6	Swales w/o Ditch Blocks	Swales without blocks	Completed	4,949
FDOT-7	Existing Stormwater Wet Ponds	Wet detention	Completed	2,646
FDOT-8	SR 78 Project	Wet detention	Completed	264

Total Projects Reduction = 11,857 lbs/yr

TABLE A-5: LUCAYA CDD PROJECTS

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
LU-1	Education/Fertilizer	Education/fertilizer	Completed	0

Total Projects Reduction = 0 lbs/yr

TABLE A-6: LEE COUNTY PROJECTS

¹ Project was listed but had unproven credit.

PROJECT NUMBER	PROJECT NAME	PROJECT DETAIL	STATUS	TN REDUCTION (LBS/YR)
LC-1	Yellow Fever Creek Preserve	Purchase and conversion to conservation lands	Completed	32
LC-2	Billy's Creek Preserve	Purchase and conversion to conservation lands	Completed	17
LC-3	Six Mile Cypress Preserve	Purchase and conversion to conservation lands	Completed	13
LC-4	Bob Jane's Preserve	Conservation purchase	Completed	0 ¹
LC-5	Buckingham Trails Preserve	Purchase and conversion to conservation lands	Completed	13
LC-6	Caloosahatchee Cks Preserve	Purchase and conversion to conservation lands	Completed	15
LC-7	Deep Lagoon Preserve	Purchase and conversion to conservation lands	Completed	3
LC-8	Hickory Swamp Preserve	Purchase and conversion to conservation lands	Completed	3
LC-9	Orange River Preserve	Purchase and conversion to conservation lands	Completed	3
LC-10	Prairie Pines Preserve	Purchase and conversion to conservation lands	Completed	3
LC-11	Telegraph Creek Preserve	Conservation purchase	Completed	0 ¹
LC-12	West Marsh Preserve	Purchase and conversion to conservation lands	Completed	3
LC-13	Yellow Fever Creek Preserve	Conservation purchase	Completed	0 ¹
LC-15	Education Efforts	FYN, landscaping ordinance, irrigation ordinance, fertilizer ordinance, pamphlets, PSAs, website, illicit discharge program	Ongoing	20,445
LC-16	Street Sweeping	345.9 lane miles swept annually	Ongoing	416
LC-17	NFM Powell Creek Extension/ Lost Lane Levee	Conveyance improvements to increase residence time, rehydrate offsite wetlands on adjacent properties, and accommodate offsite flows	Completed	2,976
LC-18	Whiskey Creek Weir Reconstruction	Retention lake weir repairs to restore originally intended design and operation	Completed	3,364
LC-19	Caloosahatchee Creeks	Hydrologic restoration	Completed	4,251
LC-20	Powell Creek Filter Marsh	Created wetland areas, boardwalks, and trails and stabilized crossing of Powell Creek	Completed	1,693
LC-21	Nalle Grade Stormwater Park	Dry retention pond	Future	300
LC-22	Deep Lagoon Hydraulic Restoration	Hydrologic restoration and enhancement, water conservation, wildlife habitat enhancement, and flood protection for surrounding area	Completed	3,097
LC-23	Popash Creek Restoration	Hydrologic restoration to more natural flow regime by increasing water storage on property and improving both on- and offsite flows	Completed	6,596
LC-23	Billy's Creek Wetland	Billy Creek filter marsh park	Completed	2,684

Total Projects Reduction = 45,927 lbs/yr

TABLE A-7: FDACS' NOI ENROLLMENT REDUCTION ESTIMATES AS OF DECEMBER 2014

N/A – Not applicable

2004 SFWMD LAND USE	ACREAGE	TN LOAD DELIVERED (LBS/YR)	TN REDUCTION ESTIMATE	TN REDUCTION (LBS/YR)
Citrus	49	303	10%	30
Cropland/improved pasture/tree crops	17,675	116,246	25%	29,062
TOTAL	17,724	116,549	N/A	29,092