# 2015 ANNUAL PROGRESS REPORT

## for the Manatee River
## Basin Management Action Plan

prepared by the
**Division of Environmental Assessment and Restoration**
Watershed Restoration Program
Florida Department of Environmental Protection

in cooperation with the
**Manatee River Stakeholders**

July 2015

**2600 Blair Stone Road**
**Tallahassee, FL 32399-2400**

# ACKNOWLEDGMENTS

This *2015 Progress Report for the Manatee River 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 with participation from Manatee River Basin stakeholders. Additional input was received from members of the Tampa Bay Estuary Program and Tampa Bay Nutrient Management Consortium who are not specifically mentioned below.

### MANATEE RIVER BASIN PARTICIPANTS

- Manatee County.
- Florida Department of Agriculture and Consumer Services.
- Florida Department of Transportation.
- Florida Power and Light.
- City of Palmetto.
- SMR Farms.
- CSX.
- Tampa Bay Regional Planning Council.
- Southwest Florida Water Management District.
- Tampa Bay Estuary Program.
- Sierra Club.
- The Mosaic Company.
- Lakewood Ranch.
- City of Bradenton.
- CF Industries.
- Schroeder-Manatee Ranch.
- Braden River Utilities.
- Florida Department of Health.

For additional information on the watershed management approach in the Manatee River Basin, contact:

Terry Hansen, P.G., Basin Coordinator
Florida Department of Environmental Protection
Watershed Restoration Program, Watershed Planning and Coordination Section
2600 Blair Stone Road, Mail Station 3565
Tallahassee, FL 32399-2400
Email: terry.hansen@dep.state.fl.us
Phone: (850) 245–8561

# Table of Contents

## List of Figures



## List of Tables

# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BMAP | Basin Management Action Plan |
| BMP | Best Management Practice |
| $BOD_5$ | Five-Day Biochemical Oxygen Demand |
| CES | Cooperative Extension Service |
| DEP | Florida Department of Environmental Protection |
| DO | Dissolved Oxygen |
| FDACS | Florida Department of Agriculture and Consumer Services |
| FDOT | Florida Department of Transportation |
| LA | Load Allocation |
| mg/L | Milligrams Per Liter |
| MS4 | Municipal Separate Storm Sewer System |
| NMC | (Tampa Bay) Nitrogen Management Consortium |
| NPDES | National Pollutant Discharge Elimination System |
| STORET | STOrage and RETrieval (database) |
| SWFWMD | Southwest Florida Water Management District |
| TBEP | Tampa Bay Estuary Program |
| TMDL | Total Maximum Daily Load |
| TN | Total Nitrogen |
| TP | Total Phosphorus |
| WBID | Waterbody Identification |
| WLA | Wasteload Allocation |

# SUMMARY

The Manatee River Basin Management Action Plan (BMAP) was developed with participation from areawide stakeholders with the assistance of the Tampa Bay Estuary Program (TBEP) and the Tampa Bay Nitrogen Management Consortium (NMC). The TBEP has been successful in coordinating a plan to reduce nutrient inputs to Tampa Bay by working with NMC members to assess the actual loads generated, implement actions to reduce nitrogen loadings, and then monitor improvements in seagrass coverage throughout the bay. Through the implementation of projects, activities, and additional source assessment, stakeholders expect the following outcomes:

- Continued improvements in water quality trends in the Manatee River.
- Decreased loading of the target pollutant, total nitrogen (TN).
- Identification of potential sources of fecal coliform impairments.
- Increased coordination between state BMAP efforts and TBEP and NMC members in problem solving for surface water quality restoration.
- Determination of effective projects through the stakeholder decision-making and priority-setting processes.

## Total Maximum Daily Loads (TMDLs)

The Florida Department of Environmental Protection (DEP) adopted fecal, nutrient, and dissolved oxygen (DO) TMDLs for the Manatee River Basin in 2009. The Manatee River BMAP was adopted in April 2014 to implement these TMDLs. This 2015 Progress Report is the annual assessment report for the Manatee River BMAP, and it describes the major accomplishments and issues identified during the reporting period from April 1, 2014, to March 31, 2015.

## Major Accomplishments

The first year of BMAP implementation has been successful. The BMAP includes 61 projects. Of those projects, 54 are completed, and the remainder are ongoing activities.

## Water Quality Trends

DEP has collected samples in the Manatee River since 1990. To enhance the understanding of basin loads, track project implementation, and identify long-term water quality trends, water quality data were collected for DO, DO percent saturation, TN and total phosphorus (TP). The Southwest Florida Water Management District (SWFWMD) monitors the health of Tampa Bay. The information gathered will measure progress toward achieving the TN and TP TMDLs and provide a foundation for continued improvement in cost-effective project implementation.

# Section 1: INTRODUCTION

## 1.1 PURPOSE OF THE REPORT

The Manatee River Basin Management Action Plan (BMAP) was developed in collaboration with areawide stakeholders with the assistance of the Tampa Bay Estuary Program (TBEP) and the Tampa Bay Nitrogen Management Consortium (NMC). The TBEP has been successful in coordinating a plan to reduce nutrient inputs to Tampa Bay by working with NMC members to assess the actual loads generated, implement actions to reduce nitrogen loadings, and then monitor improvements in seagrass coverage throughout the bay. The BMAP incorporates those efforts.

This is the first annual Progress Report for the Manatee River BMAP. **Section 2** describes the water quality monitoring and trends that occurred during the period from April 1, 2014, to March 31, 2015, for the Manatee River Basin. **Section 3** describes the projects and activities that occurred during the reporting period.

## 1.2 TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR THE ALAFIA RIVER BASIN

The Manatee River BMAP addresses the total nitrogen (TN), total phosphorus (TP), and fecal coliform TMDLs for the following segments with waterbody identification (WBID) numbers: WBID 1923, WBID 1926, WBID 1913, and WBID 1914. **Table 1** lists the TMDLs and pollutant load allocations adopted by rule for the watershed.

**Table 1: Manatee River Basin TMDLs**

| WBID | Waterbody Name | TMDL Components |
|---|---|---|
| **1923** | Rattlesnake Slough | **TP (% load reduction)**<br>– Wasteload Allocation (WLA) (National Pollutant Discharge Elimination System [NPDES] stormwater) = 21%<br>– Load Allocation (LA) = 21%<br>**TN (% load reduction)**<br>– WLA (NPDES stormwater) = 30% reduction<br>– LA = 30% reduction<br>**Five-Day Biological Oxygen Demand ($BOD_5$) (% load reduction)**<br>– WLA (NPDES stormwater) = 31% reduction |
| **1923** | Rattlesnake Slough | **Fecal Coliform Concentration (% load reduction)**<br>– WLA (NPDES stormwater) = 43% reduction<br>– LA = 43% reduction |
| **1926** | Cedar Creek | **Fecal Coliform Concentration (% load reduction)**<br>– WLA (NPDES stormwater) = 61% reduction<br>– LA = 61% reduction |
| **1913** | Nonsense Creek | **Fecal Coliform Concentration (% reduction)**<br>– WLA (NPDES stormwater) = 57% reduction<br>– LA = 57% reduction |

| WBID | Waterbody Name | TMDL Components |
|---|---|---|
| **1913** | Nonsense Creek | **TN (% load reduction)**<br>– WLA (NPDES stormwater) = 27% reduction<br>– LA = 27% reduction<br>**$BOD_5$ (% load reduction)**<br>– WLA (NPDES stormwater) = 36 % reduction<br>– LA = 36% reduction |
| **1914** | Braden River above Evers Reservoir | **Fecal Coliform Concentration (% reduction)**<br>– WLA (NPDES stormwater) = 43% reduction<br>– LA = 43% reduction |

## 1.3 AREA COVERED BY THE MANATEE RIVER BMAP

**Figure 1** shows the locations of the WBIDs addressed in the Manatee River BMAP.

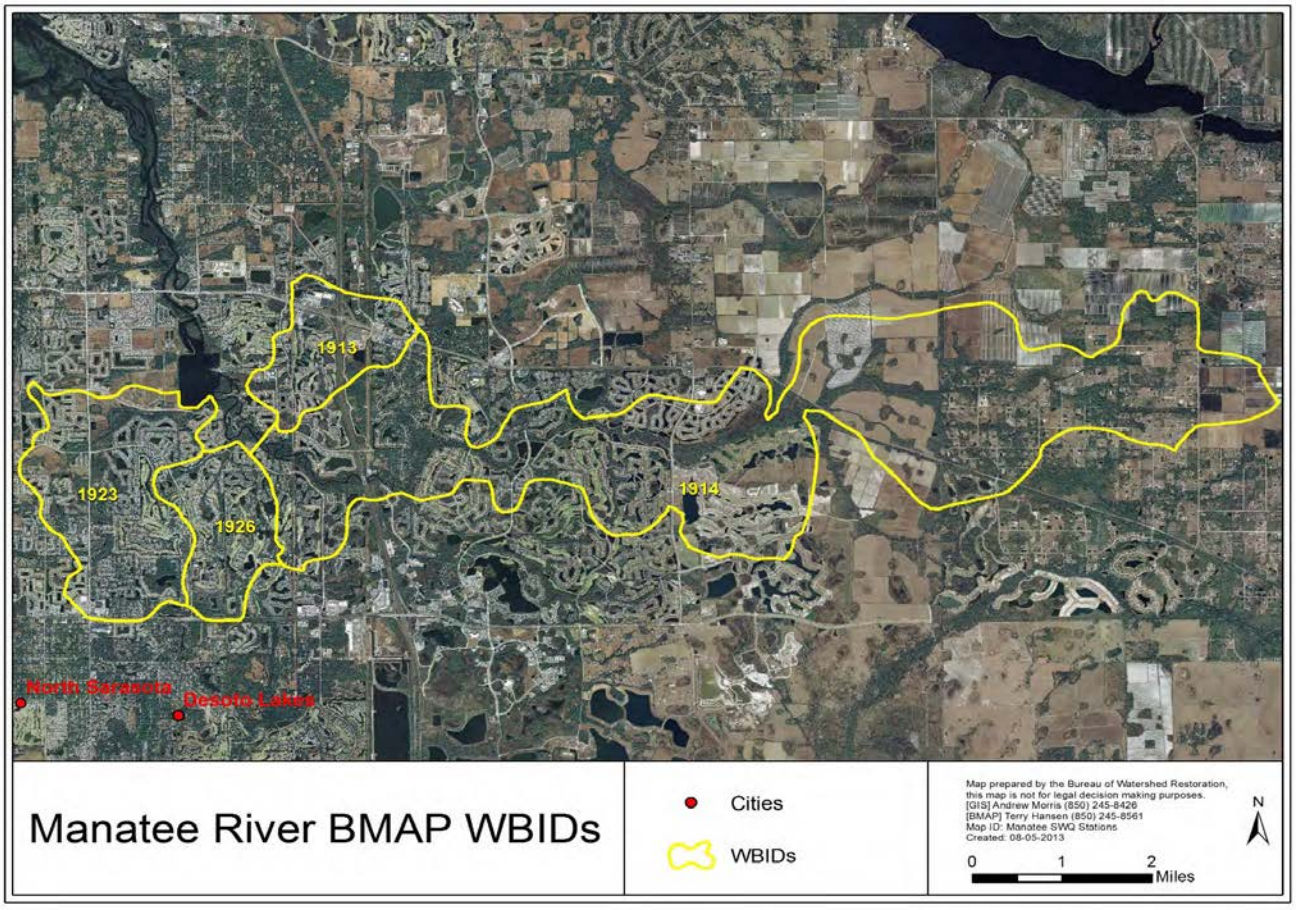


**Figure 1: Manatee River Basin WBIDs addressed in the BMAP**

# Section 2. WATER QUALITY MEASUREMENTS AND TRENDS

## 2.1 WATER QUALITY MONITORING

DEP has collected samples in the Manatee River since the 1990s. The Southwest Florida Water Management District (SWFWMD) also monitors the health of Tampa Bay. To enhance the understanding of basin loads, track project implementation, and identify long-term water quality trends, water quality data were collected for dissolved oxygen (DO), DO percent saturation, TN, and TP. The information gathered will measure progress toward achieving the TN and TP TMDLs and provide a foundation for continued improvement in cost-effective project implementation.

## 2.2 WATER QUALITY MONITORING OBJECTIVES

Focused objectives are critical for a monitoring strategy to provide the information needed to evaluate implementation success. The primary and secondary objectives of the monitoring strategy for the tributaries, described below, will be used to evaluate the success of the BMAP, help interpret the data collected, and provide information for potential future refinements of the BMAP.

### *2.2.1 Primary Objective*

On a baywide basis, Tampa Bay currently appears to be on track in terms of meeting its TN, chlorophyll *a*, water clarity, and seagrass restoration goals (TBEP 2006; Yates *et al.* 2011; Sherwood 2014). As a result, future watershed management actions will presumably focus on the TBEP's "hold-the-line" strategy, seeking to compensate for ongoing population growth and prevent TN loads from increasing as the human population of the watershed continues to expand. If those management efforts are successful, TN concentrations in the Manatee River Tidal Reach in future years are likely to be comparable to those observed today.

Year-to-year algae abundance (measured as chlorophyll *a* concentrations) and visible light penetration through the water column (Secchi depth) have been identified as critical water quality indicators in Tampa Bay. Based on water quality data from 2014, the TBEP has determined that for the third year in a row, all bay segments received a "Green" management status indicating that projects would continue as planned. This is the first time since monitoring began that all four bay segments met targets for three straight years, indicating that water quality is improving. Additionally, seagrass gains have been documented in all bay segments.

Additional information regarding the TBEP's Nitrogen Management Strategy is available online.

### *2.2.2 Secondary Objective*

Additional water quality sampling stations are monitored throughout the Manatee River Basin. **Table 2** and **Table 3** and **Figure 2** and **Table 3** reflect the annual geometric mean for the sampling stations located in WBIDs 1923, 1926, 1913, and 1914 for DO, DO percent saturation, TN, and TP. Physical factors that determine circulation, flushing, and reaeration rates could be playing critical roles. If so, the BMAP Program may wish to focus on examining those factors, their interactions with each other and with ambient nutrient levels, and the effects of those interactions on ambient DO concentrations. That information could be used to develop a strategy for achieving compliance with existing DO criteria or developing site-specific alternative criteria that are consistent with the waterbody's physical characteristics.

In the Nonsense Creek watershed (WBID 1913), the DO concentration and saturation appear to be increasing since the adoption of TMDLs in 2009. Concentrations of TN have remained relatively constant, and TP has decreased slightly.In the Rattlesnake Slough watershed (WBID 1923), the DO concentration and saturation appear to have increased slightly during the period from 2010 to 2013. TN and TP concentrations in the watershed have decreased slightly since the TMDLs were adopted in 2009.

**Table 2: Nonsense Creek geometric mean of DO, DO saturation, TN, and TP, 2010–13**

| Year | DO [milligrams per liter (mg/L)] | TN (mg/L) | TP (mg/L) | DO Saturation (%) |
|---|---|---|---|---|
| **2010** | 6.45 | 1.08 | 0.07 | 71.98% |
| **2011** | 6.00 | 1.11 | 0.09 | 70.57% |
| **2012** | 6.97 | 1.07 | 0.07 | 81.81% |
| **2013** | 7.11 | 1.08 | 0.06 | 82.25% |

**Table 3: Rattlesnake Slough Geometric Mean of DO, DO Saturation, TN, and TP, 2010–13**

| Year | DO (mg/L) | TN (mg/L) | TP (mg/L) | DO Saturation (%) |
|---|---|---|---|---|
| **2010** | 6.40 | 1.22 | 0.35 | 71.50% |
| **2011** | 6.19 | 1.13 | 0.42 | 73.22% |
| **2012** | 6.88 | 1.08 | 0.36 | 82.27% |
| **2013** | 6.48 | 1.15 | 0.34 | 77.34% |

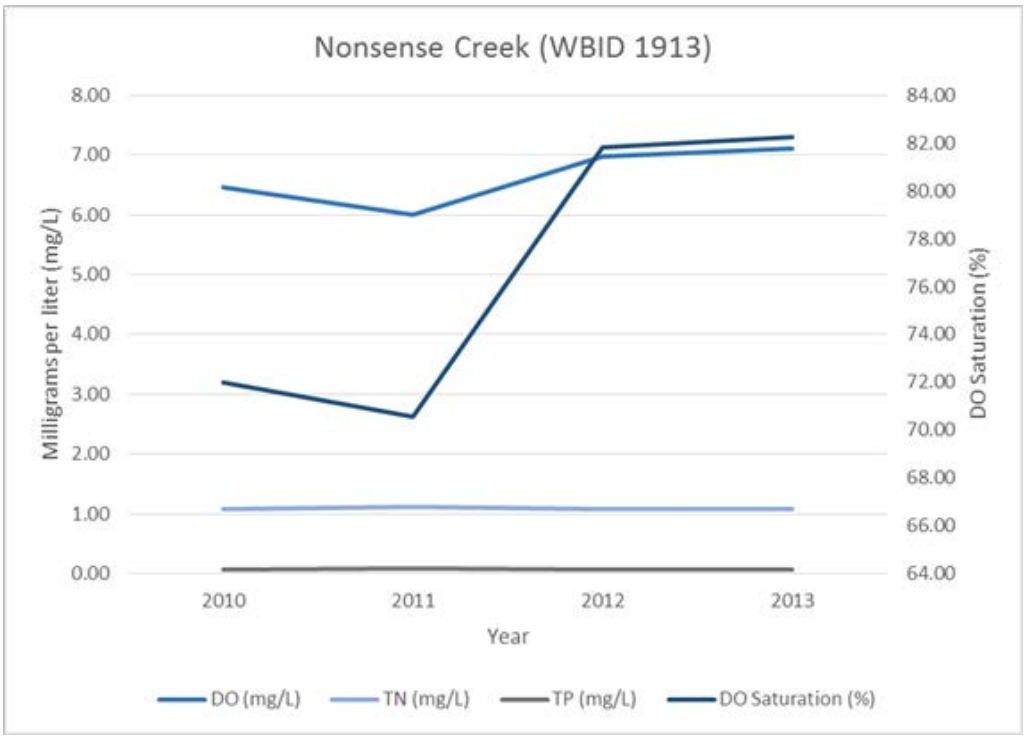


**Figure 2: Nonsense Creek geometric mean of DO, DO saturation, TN, and TP, 2010–13**

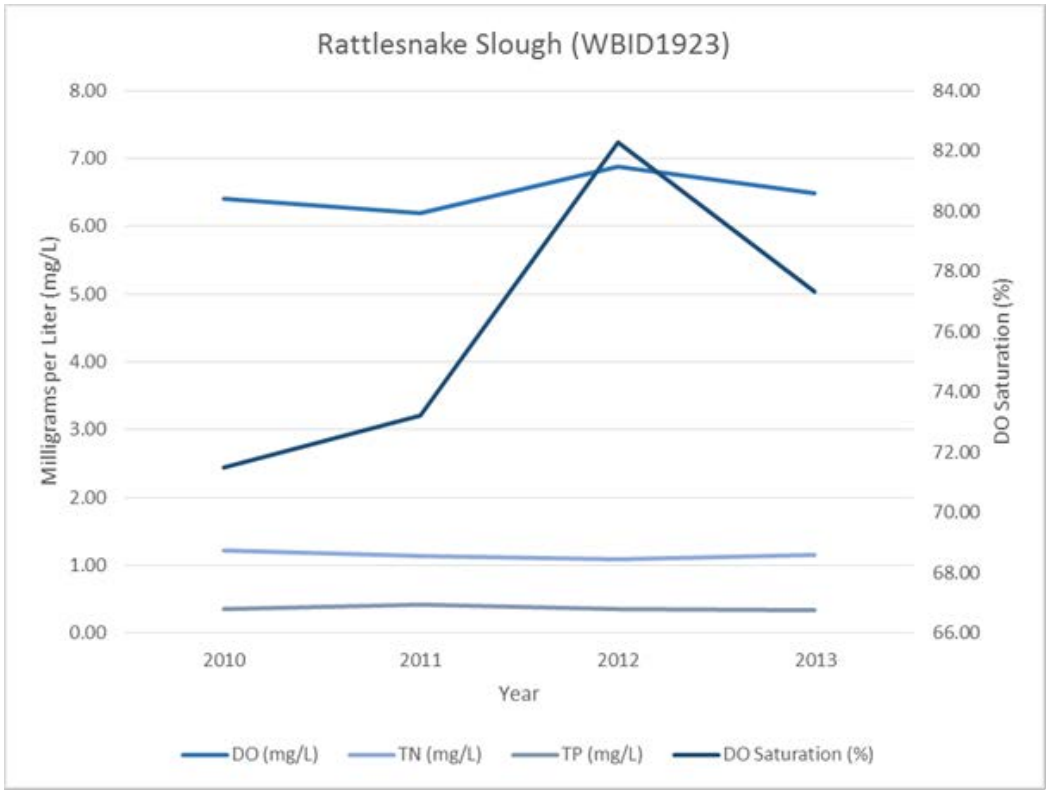


**Figure 3: Rattlesnake Slough geometric mean of DO, DO saturation, TN, and TP, 2010–13**

## 2.3 FECAL COLIFORM TRENDS

A draft Walk the Waterbody report was completed for Cedar Creek during the reporting period. The report summarizes the results of field reconnaissance activities conducted to gain a better understanding of the watersheds relating to observed high concentrations of fecal coliform bacteria. The exercise allows stakeholders to identify uncertainties and future options for more effective adaptive management.

The report summarizes the results of the Walk the WBID exercise for the Cedar Creek watershed, located in southwestern Manatee County, on May 17, 2013. All agencies with jurisdictional authority collaborated before, during, and after the event. However, representatives from the Manatee County Parks and Natural Resources Department were the only individuals involved in the actual fieldwork due to the homogeneity of the land use and small size of the Cedar Creek watershed.

As a result of the Walk the WBID exercise, the county will continue to implement a Phase I NPDES permit for the municipal separate storm sewer system (MS4) that has been ongoing for more than 15 years. The county is committed to continuing the implementation of the county's fertilizer ordinance. It also is committed to continue ambient water quality sampling, including bacteriological sampling, in the Cedar Creek watershed. Sampling data are uploaded to the department's STOrage and RETrieval (STORET) water quality database.

# Section 3. PROJECT DESCRIPTIONS

**Section 3.1** through **Section 3.14** describe the accomplishments in the Manatee River Basin over the past year, and **Appendix A** contains the individual project tables.

## 3.1 MANATEE COUNTY

Manatee County has met the BMAP commitments as required.

## 3.2 BRADEN RIVER UTILITIES

Braden River Utilities has met the BMAP commitments as required.

## 3.3 RIVER CLUB HOMEOWNERS ASSOCIATION

River Club Homeowners Association has met the BMAP commitments as required.

## 3.4 DEP

DEP has met the BMAP commitments as required.

## 3.5 SCHROEDER-MANATEE RANCH

Schroeder-Manatee Ranch has met the BMAP commitments as required.

## 3.6 SWFWMD

The SWFWMD has met the BMAP commitments as required.

## 3.7 CITY OF BRADENTON

Bradenton has met the BMAP commitments as required.

## 3.8 TECO

TECO has met the BMAP commitments as required.

## 3.9 MANATEE COUNTY COOPERATIVE EXTENSION SERVICE (CES)

Manatee County CES has met the BMAP commitments as required.

## 3.10 GUS MUENCH (COMMERCIAL CRABBER)

Gus Muench has met the BMAP commitments as required.

## 3.11 CITY OF ANNA MARIA

Anna Maria has met the BMAP commitments as required.

## 3.12 FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES (FDACS)

**Figure 4** shows the agricultural land use in the Manatee River BMAP area. **Table 4** summarizes the land use data, the FDACS-adjusted acreage, the number of acres enrolled in best management practice (BMP) programs, and the goal for enrolling additional acres in the basin. The acreage used to calculate the starting point agricultural nutrient load is based on 2008 land use information from the SWFWMD.

It is important to understand that, even if all targeted agricultural operations are enrolled, not all of the acreage listed as agriculture in **Table 4** will be included in enrollment figures. The NOIs will document the estimated total number of acres on which applicable BMPs are implemented, not the entire parcel acreage. This is because land use data can contain nonproduction acres (such as buildings, parking lots, and fallow acres) that will not be counted on the NOIs submitted to FDACS. There also may be significant amounts of acreage that do not need to be enrolled, such as lands that are not actively involved in commercial agriculture (operations conducted as a business). These areas are often low-density residential uses on large parcels of grassed land, or land that was but is no longer in commercial agricultural production. This information is often impossible to discern in the photo interpretation process used to generate land use data. Local governmental, SWFWMD, or DEP BMPs may address these noncommercial sources.

Based on aerial imagery and field staff observation, FDACS adjusted these figures to reflect current agricultural land use acreage more accurately. The FDACS-adjusted acreage shows approximately 8.8% less total acreage than indicated in the 2008 figures, due to nonproduction land that would not need to be enrolled but that is included in agricultural land use and classified as "other open lands – rural." In addition, some acreage has ceased production since 2008 and also would not need to be enrolled in BMPs. The majority of this acreage has been or is in the process of being converted to urban land uses.

All agricultural nonpoint sources in the BMAP area are statutorily required either to implement FDACS-adopted BMPs or to conduct water quality monitoring that demonstrates compliance with state water quality standards.

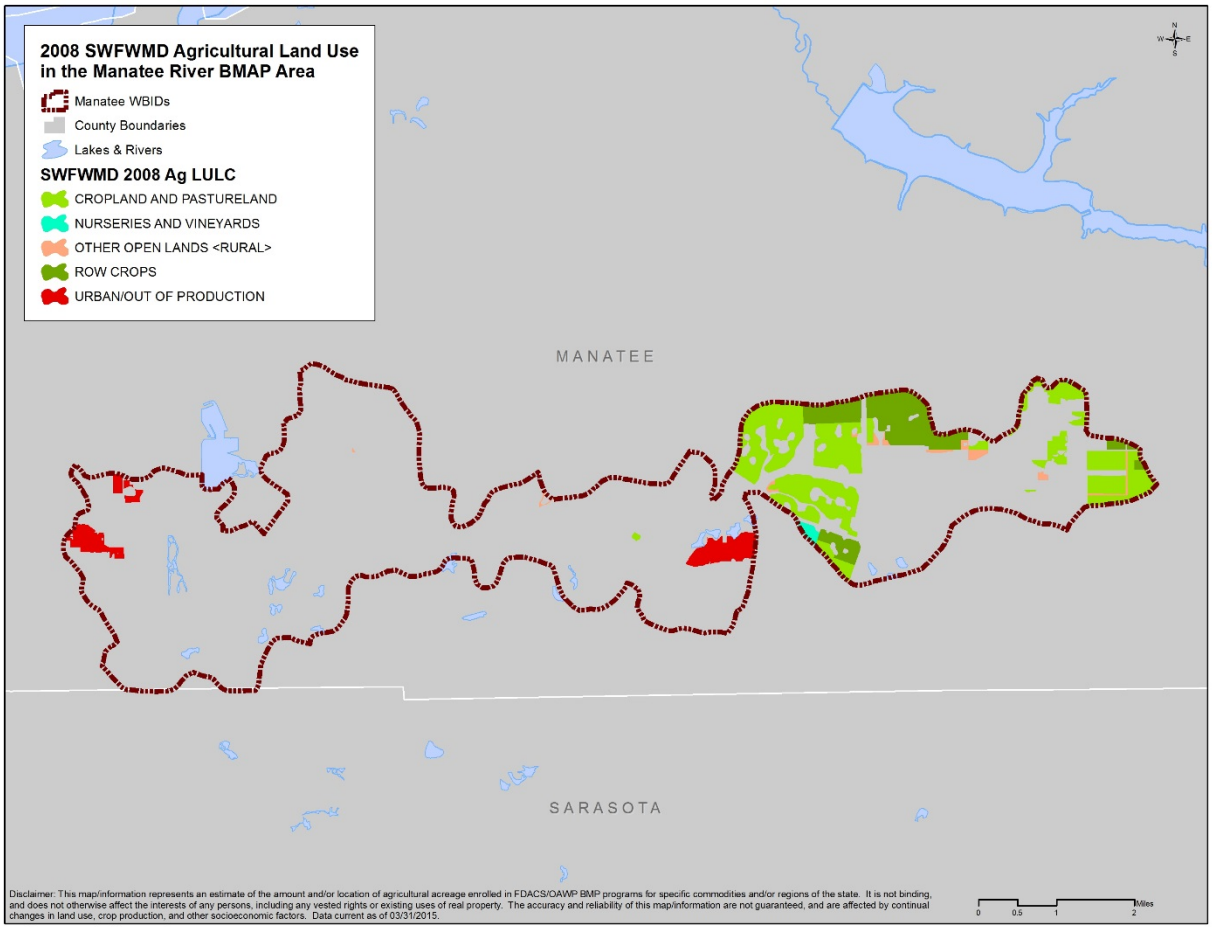


**Figure 4. Agricultural land use based on 2008 SWFWMD data and FDACS-adjusted acreage in the Manatee River BMAP WBIDs**

## Table 4. Agricultural acreage, BMP enrollment, and future enrollment goals in the Manatee River Basin

[1] FDACS-adjusted acreage for purposes of enrollment is based on a review of more recent aerial imagery in the basin and local staff observations.
NA = Not applicable

| 2008 SWFWMD Land Use | 2008 Acres | FDACS-Adjusted Acres for Enrollment[1] | Rrlated FDACS BMP Programs | Acreage Enrolled | Related NOIs Certification |
|---|---|---|---|---|---|
| **Pastureland and Rangeland** | 1,945.2 | 1,945.2 | Cow/Calf<br>Sod | 1,335.9<br>416.5 | 2<br>1 |
| **Row/Field/Mixed Crops** | 604.7 | 335.9 | Vegetable/ Agronomic Crops | 525.6 | 2 |
| **Nurseries and Vineyards** | 1.0 | 1.0 | Container Nursery | 0 | 0 |
| **Other Open Land - Rural** | 114.6 | 0 | No Enrollment Needed | NA | NA |
| **TOTAL** | **2,665.5** | **2,282.1** | | **2,278.0** | **5** |

**Enrolled Acreage (March 31, 2013) 2,278.0**

**Figure 5** shows the acres enrolled in BMPs as of March 31, 2015. After accounting for the FDACS-adjusted acreage that is now urban and/or out of production, there is no remaining significant unenrolled agricultural acreage in this BMAP area. Regional staff will attempt to enroll any remaining small operations and will update the existing enrollment as needed through the implementation assurance process.

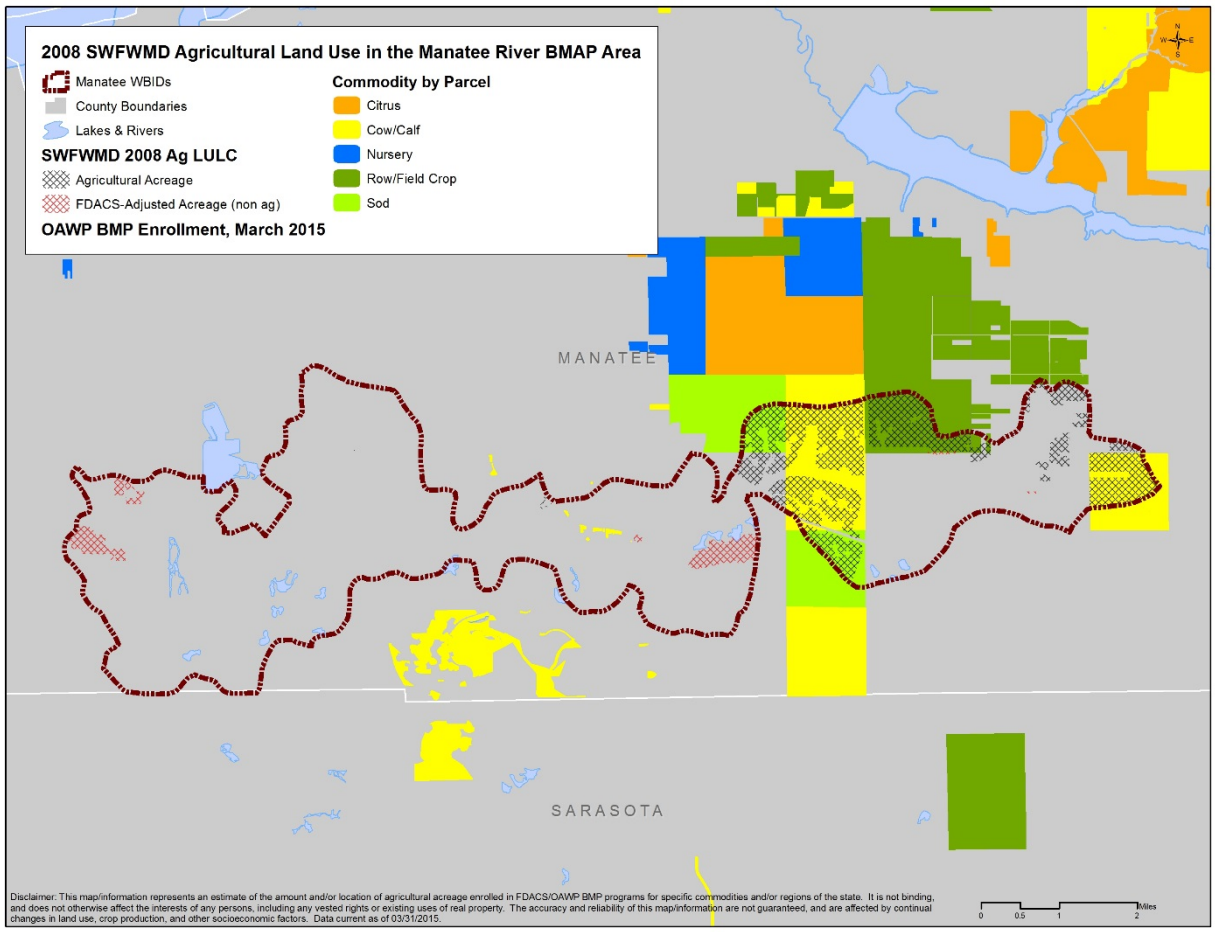


**Figure 5. BMP enrollment as of March 31, 2013, in the Manatee River Basin**

Due to inaccuracies in land use information and changes in land use since 2008, agricultural loadings may be less than indicated in the TMDLs. The region is expected to continue the shift from agricultural to residential/urban land uses, further reducing agricultural loading. More precise information will be incorporated into the next iteration of the TMDLs, and the estimated agricultural load will be adjusted to reflect the updated acreage figure. The potential refinement of a basin- and commodity-specific agricultural loading/reduction model should be considered during the first BMAP cycle.

## 3.13 FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) DISTRICT 1

FDOT District 1 has met the BMAP commitments as required.

## 3.14 SUMMARY OF ACCOMPLISHMENTS

The Manatee River BMAP was developed in collaboration with areawide stakeholders with the assistance of the TBEP and the Tampa Bay NMC. The TBEP has been successful in coordinating a plan to reduce nutrient inputs to Tampa Bay by working with NMC members to assess the actual loads generated, implement actions to reduce nitrogen loadings, and then monitor improvements in seagrass coverage throughout the bay. The projects included in the TBEP Reasonable Assurance Plan are included in this BMAP in addition to other projects. Due to the completed and ongoing efforts of these stakeholders, Tampa Bay water quality appears to be improving; this will subsequently improve water quality in the Manatee River basin tributaries.

# APPENDIX A: BMAP PROJECTS

The BMAP project tables below show the status of the projects as of March 31, 2015. These tables provide information on the types of projects completed or under way by stakeholders and the project number associated with the TBEP Reasonable Assurance Plan. The schedule to implement each of the projects is also included in the tables. Project numbers have been assigned to each project, to aid in project tracking over time. Most of the project numbers are based on the Tampa Bay project database. Where there were projects in the BMAP that were not included in the Tampa Bay database, numbers that reflect the responsible entity names have been assigned.

## Table A-1: Manatee County

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Manatee County** | MC-1 | Walk the Waterbody-Rattlesnake Slough | Other | Completed | 2012 |
| **Manatee County** | MC-2 | Walk the Waterbody-Cedar Creek | Other | Completed | 2013 |
| **Manatee County** | TBEP-1015 | Buffalo Canal Watershed Management Program | | Ongoing | 2008 |
| **Manatee County** | TBEP-1016 | Gamble Creek Watershed Management Program | | Ongoing | 2008 |
| **Manatee County** | TBEP-1165 | Braden River Area Surface Water Assessment | | Completed | 2012 |
| **Manatee County** | TBEP-714 | Ware's Creek Flood Reduction | Restoration land acquisition, and water quality improvement | Completed | 2012 |
| **Manatee County** | TBEP-87 | Overlay District Projects- Development | Stormwater management program | Completed | 2000 |
| **Manatee County** | TBEP-88 | Overlay District Projects-Agriculture | Agriculture BMPs | Completed | 2000 |
| **Manatee County** | TBEP-91 | Central Sewer Hook-ups in Manatee County | Wastewater infrastructure | Completed | 2003 |
| **Manatee County** | TBEP-92 | Tropicana Point Discharge to Deep Well Injection | Restoration land acquisition, and water quality improvement | Completed | 2003 |
| **Manatee County** | TBEP-929 | Robinson Preserve | Restoration land acquisition, and water quality improvement | Completed | 2006 |
| **Manatee County** | TBEP-930 | Pine Island | Restoration land acquisition, and water quality improvement | Completed | 2003 |
| **Manatee County** | TBEP-931 | Parrish Life Estate | Restoration land acquisition, and water quality improvement | Completed | 2006 |
| **Manatee County** | TBEP-932 | Manatee River Headwaters Wetlands Restoration | Restoration land acquisition, and water quality improvement | Completed | 2005 |
| **Manatee County** | TBEP-933 | Mining Mitigation Parcel | Restoration land acquisition, and water quality improvement | Completed | 2006 |

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Manatee County** | TBEP-934 | Hidden Harbour | Restoration land acquisition, and water quality improvement | Completed | 2004 |
| **Manatee County** | TBEP-938 | Gulfstream Pipeline Mitigation | Restoration land acquisition, and water quality improvement | Completed | 2008 |
| **Manatee County** | TBEP-939 | Neal Preserve | Restoration land acquisition, and water quality improvement | Completed | 2005 |
| **Manatee County** | TBEP-940 | Duette Land Acquisition | Restoration land acquisition, and water quality improvement | Completed | 2006 |
| **Manatee County** | TBEP-941 | Future Land Acquisition at Duette Park | Restoration land acquisition, and water quality improvement | Completed | 2007 |
| **Manatee County** | TBEP-942 | Conservatory | Restoration land acquisition, and water quality improvement | Completed | 2004 |
| **Manatee County** | TBEP-946 | East County Transit Route | Other | Completed | 2010 |
| **Manatee County** | TBEP-950 | Artificial Reef Ball Program | | Completed | |
| **Manatee County** | TBEP-951 | Gladiolus/North Shore Basin Project | | Completed | 2006 |
| **Manatee County** | TBEP-952 | Grassy Point Project | | Completed | 2002 |
| **Manatee County** | TBEP-954 | Blueways Guide | Public education and outreach | Completed | |
| **Manatee County** | TBEP-955 | Prairie Schooner at Duette Park | Public education and outreach | Ongoing | |
| **Manatee County** | TBEP-956 | Visitors Center at Emerson Point | Public education and outreach | Ongoing | |
| **Manatee County** | TBEP-957 | Wares Creek Dredging | | Completed | 2008 |
| **Manatee County** | TBEP-958 | Regatta Point Clean Marina | | Ongoing | 2001 |
| **Manatee County** | TBEP-959 | Perico Harbor Clean Marina | | Ongoing | 2001 |
| **Manatee County** | TBEP-964 | Jeff's Cowpen Creek Dredge and Silt Box Project | | Completed | 2003 |
| **Manatee County** | TBEP-965 | Flow Reductions within Select Watersheds | Stormwater management program | Completed | 2005 |
| **Manatee County** | TBEP-966 | Visitors Center at Emerson Point | Public education and outreach | Completed | |

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Manatee County** | TBEP-968 | Seagrass Protection Ordinance | Regulations, ordinances and guidelines | Ongoing | |
| **Manatee County** | TBEP-969 | Irrigation Requirements for Developments | Regulations, ordinances and guidelines | Completed | 1999 |
| **Manatee County** | TBEP-970 | Clean Marina Requirement | Regulations, ordinances and guidelines | Ongoing | |
| **Manatee County** | TBEP-971 | Additional Wetland Buffers for Larger Developments | Regulations, ordinances and guidelines | Completed | |
| **Manatee County** | TBEP-1312 | Fertilizer Ordinance | Regulations, ordinances and guidelines | Completed | 2011 |

## Table A-2: SWFWMD

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **SWFWMD** | TBEP-501 | Palmetto Estuary Preserve Habitat Restoration (Phase I) | Restoration land acquisition, and water quality improvement | Completed | 2000 |

## Table A-3: City of Bradenton

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **City of Bradenton** | TBEP-681 | Bradenton Reclaimed | Wastewater infrastructure | Ongoing | 2000 |

## Table A-4: TECO

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **TECO** | TBEP-769 | Repowering Gammon Power Plant - Bayside Facility | Restoration land acquisition, and water quality improvement | Completed | 2003 |
| **TECO** | TBEP-779 | Big Bend Power Plant Improvements | Restoration land acquisition, and water quality improvement | Completed | 2004 |
| **TECO** | TBEP-789 | Big Bend Power Plant Improvements | Restoration land acquisition, and water quality improvement | Completed | 2005 |

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **TECO** | TBEP-799 | Hookers Point Facility - Shut Down | Restoration land acquisition, and water quality improvement | Completed | 2002 |

## Table A-5: Manatee County CES

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Manatee County CES** | TBEP-901 | Citrus Conversion to Microirrigation | Agriculture BMPs | Completed | 2000 |
| **Manatee County CES** | TBEP-911 | Field and Row Crop Conversion to Microirrigation | Agriculture BMPs | Completed | 1995 |
| **Manatee County CES** | TBEP-912 | Field and Row Crop Conversion to Microirrigation | Agriculture BMPs | Completed | 2000 |
| **Manatee County CES** | TBEP-918 | Strawberry Crop Conversion to Microirrigation | Agriculture BMPs | Completed | 1995 |

## Table A-6: Gus Muench (Commercial Crabber)

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Gus Muench (Commercial Crabber)** | TBEP-1010 | Waterfront Initiatives – Diamond Habitat Awards | Regulations, ordinances and guidelines | Completed | 2005 |

## Table A-7: City of Anna Maria

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **City of Anna Maria** | TBEP-1014 | Willow/Gulf Dr./ Pine Ave. | Stormwater management program | Ongoing | 2007 |

## Table A-8: FDOT District 5

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **FDOT** | TBEP-1166 | 201032-2 I-75 at SR 70 Interchange | Stormwater management program | Under way | |

## Table A-9: Braden River Utilities

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Braden River Utilities** | TBEP-1165 | Reclaimed Water | Wastewater infrastructure | Completed | 2012 |

## Table A-10: River Club Homeowners Association

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **River Club Homeowners Association** | RCHA-1 | 2010 Love Our Lake Campaign | Education and outreach | Under way | |
| **River Club Homeowners Association** | RCHA-2 | 2011 Volunteer Water Quality Education Program | Education and outreach | Under way | |
| **River Club Homeowners Association** | RCHA-3 | 2012 Project to Reduce Nutrient Runoff in Stormwater Ponds | | Under way | |
| **River Club Homeowners Association** | RCHA-4 | Additional Projects | | Under way | |

## Table A-11: Schroeder-Manatee Ranch

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **Schroeder - Manatee Ranch** | SMR-1 | Water Quality Monitoring | Special studies, planning, monitoring and assessment | Under way | |
| **Schroeder-Manatee Ranch** | SMR-2 | Agricultural BMPs (Citrus, Cow/Calf, Container Nurseries, Sod) | Agriculture BMPs | Under way | |

## Table A-12: DEP/FDACS

| Lead Entity | Project Number | Project Name | Project Type | Project Status | Project Completion Year |
|---|---|---|---|---|---|
| **DEP/FDACS** | TBEP-1194 | BMP Enrollment | Agriculture BMPs | Under way | |

# APPENDIX B: REFERENCES

Tampa Bay Estuary Program. 2006. *Charting the course: The comprehensive conservation and management plan for Tampa Bay.* St. Petersburg, FL.

Yates, K.K., H.S. Greening, and G. Morrison. 2011. *Integrating science and resource management in Tampa Bay, Florida.* U.S.Geological Survey Circular 1348. St. Petersburg, FL.

Sherwood, E.T. 2014. *2013 Tampa Bay water quality assessment.* Technical Report #02-14. St. Petersburg, FL: Tampa Bay Estuary Program.