

Chapter 8A: Northern Everglades and Estuaries Protection Program – Annual Progress Report¹

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SUMMARY

NORTHERN EVERGLADES PROGRAM-LEVEL UPDATES

During the 2016 legislative session, the Florida legislature amended the Northern Everglades and Estuaries Protection Program (NEEPP; Section 373.4595, Florida Statutes [F.S.]) to strengthen NEEPP provisions for implementing the respective basin management action plans (BMAPs) and further clarify the roles and responsibilities, coordination, implementation, and reporting efforts among the three coordinating agencies: South Florida Water Management District (SFWMD or District), Florida Department of Environmental Protection (FDEP), and Florida Department of Agriculture and Consumer Services (FDACS). These coordinated efforts in the Northern Everglades region—comprised of the Lake Okeechobee, Caloosahatchee River, and St. Lucie River watersheds—are expected to augment restoration currently under way in the Everglades south of the lake. Collectively, NEEPP builds upon ongoing restoration in the Lake Okeechobee, St. Lucie River, and Caloosahatchee River watersheds by identifying and implementing programs and projects necessary to achieve water quality and quantity objectives for the watersheds.

¹ The chapter authors gratefully acknowledge the management review teams of the coordinating agencies—SFWMD, FDEP, and FDACS—for providing valuable review and comments to this document.

² *FDEP Basin Management Action Plans Update* section, FDEP, Division of Environmental Assessment and Restoration, Tallahassee, FL.

³ *FDACS Agricultural Non-Point Best Management Practices Update* section, FDACS, Tallahassee, FL.

⁴ Contributed to the *Watershed Construction Project Updates* section; ^a FDACS, Okeechobee, FL.

⁵ Contributed to the *Save Our Everglades Trust Fund Expenditures* section.

⁶ Contributed to SFWMD map support.

27 In accordance with the requirements of NEEPP (Subsection 373.4595(6), F.S.), this chapter of the 2017
28 *South Florida Environmental Report (SFER) – Volume I*, along with Chapter 8B (Lake Okeechobee
29 Watershed Research and Water Quality Monitoring Results and Activities) and Chapter 8C (St. Lucie and
30 Caloosahatchee River Watersheds Research and Water Quality Monitoring Results and Activities),
31 comprise the annual progress report for Water Year 2016 (WY2016; May 1, 2015–April 30, 2016) required
32 by the District in cooperation with the other coordinating agencies. In fulfillment of NEEPP, this annual
33 progress report also documents the status of FDEP’s Lake Okeechobee, Caloosahatchee Estuary, and St.
34 Lucie River and Estuary BMAPs, respectively, and the status of FDACS’ implementation of the agricultural
35 nonpoint source best management practices (BMPs) in the Northern Everglades watersheds. Additionally,
36 this report contains an annual accounting of the expenditure of funds from the Save Our Everglades
37 Trust Fund (SOETF) per Subsection 373.4595(6), F.S., and includes the NEEPP Fiscal Year 2016–2017
38 (October 1, 2015–September 30, 2016) annual work plan per Paragraph 373.026(8)(b), F.S. Highlights
39 of key restoration activities and program-level updates for NEEPP during this reporting year are
40 summarized below.

41 • **FDEP Basin Management Action Plans Update.** Over the past year, progress
42 continued on FDEP BMAPs designed to implement nutrient reductions established
43 by the total maximum daily loads (TMDLs) for the Northern Everglades basins.
44 Summaries of the latest BMAP progress reports for these basins are included in
45 this update. Further details on the BMAPs’ status, as well as the adopted BMAP and
46 progress reports are also available on the FDEP’s BMAP web page at
47 www.dep.state.fl.us/water/watersheds/bmap.htm.

48 • *Lake Okeechobee Basin.* For the Lake Okeechobee BMAP, the annual public meeting was
49 held in May 2016, and the 2015 progress report was completed in July 2016 (FDEP 2016b).
50 As that report reflects activities only one year into the first 10-year phase of the BMAP,
51 reductions beyond those included in the BMAP have not been quantified or included in
52 this report. Progress tracked over the first year of lake BMAP implementation has mostly
53 focused on larger-scale projects and initiatives.

54 • *Caloosahatchee Estuary Basin.* For the Caloosahatchee Estuary BMAP, the annual public
55 meeting was held in March 2016, and the 2015 progress report was completed in June 2016
56 (FDEP 2016a). As of November 30, 2015, total load reductions for total nitrogen (TN) are
57 196,181 pounds per year (lbs/yr, or 88,986 kilograms per year [kg/y]), or 50 percent of the
58 TN reductions needed to meet the portion of the TMDL allocated to this basin.

59 • *St. Lucie Estuary Basin.* For the St. Lucie River and Estuary BMAP, the annual public
60 meeting will be held in October 2016, and the 2016 progress report will be completed by
61 December 2016 (FDEP 2016c). As of June 30, 2016, the total estimated reductions,
62 including those quantified prior to BMAP adoption and in previous annual reports, are
63 519,571 lbs/yr (235,673 kg/yr) of TN and 138,740 lbs/yr (62,931 kg/yr) of total phosphorus
64 (TP). Of note, these totals are greater than the nutrient reductions required in the first
65 BMAP phase for this basin.

66 • **Watershed Construction Projects.** During WY2016, SFWMD continued implementing
67 various projects with both water storage and water quality benefits to help improve
68 conditions across the Northern Everglades. In the Lake Okeechobee Watershed (LOW),
69 the District initiated construction of the southern Stormwater Treatment Area (STA) for
70 the Lakeside Ranch STA – Phase II and the Rolling Meadows Wetland Restoration –
71 Phase I projects, and continued construction activities for the Kissimmee River Restoration
72 Project (KRRP) including Reach 3 backfilling. Operations also continued for the Lakeside
73 Ranch STA (Phase I), Taylor Creek STA, and Nubbin Slough STA projects. In the St.
74 Lucie and Caloosahatchee River watersheds, the District started construction of the

75 Comprehensive Everglades Restoration Plan (CERP) Caloosahatchee River (C-43) West
76 Basin Storage Reservoir Project, continued construction of the CERP Indian River Lagoon
77 South – C-44 Reservoir/STA Project in partnership with the United States Army Corps of
78 Engineers (USACE), completed construction of Phase I mesocosms of the C-43 Water
79 Quality Treatment and Testing Facility, completed design of the Lake Hicpochee
80 Hydrologic Enhancement – North Project, and completed design of a remediation project
81 for water storage at Ten Mile Creek. FDACS’ implementation of hybrid wetland treatment
82 technologies (HWTT) and floating aquatic vegetative tilling (FAVT) technologies to
83 remove nutrients at subbasin and farm scales also progressed.

84 • **Dispersed Water Management Program.** Over the past year, the District’s
85 implementation and expansion of the Dispersed Water Management (DWM) Program
86 continued in the Northern Everglades. The storage, retention, and detention created by the
87 40 completed and operational projects—including 21 in the Lake Okeechobee, 13 in the
88 St. Lucie River, and 6 in the Caloosahatchee River watersheds—within the DWM Program
89 through WY2016 is approximately 91,662 acre-feet per year (ac-ft/yr; 113 million cubic
90 meters per year [m³/yr]). As a notable example, Nicodemus Slough currently has the largest
91 estimated annual storage benefit (33,860 ac-ft/yr, or 41.8 million m³/yr) of any single
92 operational DWM project in the Northern Everglades watersheds. Notably in 2016, an
93 FDEP survey resulted in six new regional-scale BMAP-related projects, collectively
94 known as Northern Everglades Public-Private Partnerships, selected for consideration to
95 be enrolled into this latest DWM Program element.

96 • **FDACS Agricultural Non-Point BMP Update.** FDACS’ Office of Agricultural Water
97 Policy (OAWP) adopted a revised vegetable and agronomic crop manual in late 2015
98 (FDACS 2015b) and a dairy manual in 2016 (FDACS 2015a). As of March 31, 2016,
99 FDACS has enrolled 1,793,931 acres (ac; 725,978 hectares [ha]) in the Lake Okeechobee
100 Watershed, 255,221 ac (103,284 ha) in the St. Lucie River Watershed, and 430,379 ac
101 (174,168 ha) in the Caloosahatchee River Watershed. In 2015, FDACS conducted follow-
102 up visits to determine implementation of BMPs for 387 notices of intent (NOIs) within the
103 Northern Everglades watersheds. Further details on the FDACS BMP Program are
104 available on the FDACS OAWP’s web page at [www.freshfromflorida.com/Divisions-
105 Offices/Agricultural-Water-Policy](http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy).

106 • **Lake Okeechobee Watershed Research and Water Quality Monitoring Update**
107 **(Chapter 8B).** In accordance with NEEPP, the coordinating agencies continue to
108 implement research and water quality monitoring for the lake and its watershed, with
109 results to help support FDEP’s assessment of the lake BMAP. Based on the District’s
110 routine monitoring with reporting on water quality conditions, the five-year (WY2012–
111 WY2016) average TP load from the LOW drainage basins was 510 metric tons (mt), higher
112 than the lake’s TMDL of 140 mt/yr. In WY2016, surface water flow to the lake was 3.012
113 million acre-feet (ac-ft, or 3,715 million cubic meters [m³]), and TP and TN loads to the
114 lake from tributaries and atmospheric deposition totaled 543 mt and 6,875 mt, representing
115 21 and 11 percent increases since WY2015, respectively. This year’s load increases can be
116 mostly attributed to water discharging into the lake with a higher flow-weighted mean
117 (FWM) TP concentration of 137 micrograms per liter (µg/L) (versus 117 µg/L in WY2015)
118 and TN concentration of 1.52 milligrams per liter (mg/L) (versus 1.4 mg/L in WY2015).
119 The in-lake TP concentration was 118 µg/L for WY2016 and 117 µg/L for the five-year
120 (WY2012–WY2016) moving average, exceeding the in-lake targeted goal of 40 µg/L.

121 • Regarding in-lake ecology, nearshore and pelagic regions contain several ecological
122 communities that have been monitored in recent decades for various ecological indicators
123 (such as fish and vegetation abundance) and are being used to evaluate the lake’s

124 environmental health as a function of their responses to changing hydrologic conditions.
125 Quantitative scoring has been recently developed based on statistical relationships between
126 lake stage and associated measured ecological responses, which is currently under review
127 by CERP’s Restoration Coordination and Verification Program (RECOVER).

128 • **St. Lucie and Caloosahatchee River Watershed Research and Water Quality**
129 **Monitoring Updates (Chapter 8C).** In accordance with NEEPP, the District, in
130 cooperation with the other coordinating agencies and local governments, continues to
131 implement research and water quality monitoring programs for the river watersheds that
132 build upon the agency’s existing research program and helps support FDEP’s assessment
133 of the BMAPs in the respective estuary basins. An overview of key District research and
134 monitoring findings of estuarine conditions for the St. Lucie Estuary and Caloosahatchee
135 River Estuary are summarized below.

136 • **St. Lucie Estuary (SLE).** In WY2016, annual rainfall in the St. Lucie River Watershed
137 was 54.17 inches (137.6 centimeter [cm]). Atypically, more than half of this total (54.5
138 percent) occurred during the dry season due to El Niño conditions. Total freshwater inflow
139 to the SLE was 1.219 million ac-ft (1,505 million m³), with the majority (69.6 percent)
140 coming from the St. Lucie River Watershed and 30.4 percent from Lake Okeechobee.
141 Again due to El Niño conditions, 91 percent of the lake contribution came in the dry season.
142 Salinity at the US1 Roosevelt Bridge was within the desired salinity range for 58.3 percent
143 of the time and less favorable than the previous two years. TN and TP loadings to the SLE
144 were 1990.7 mt and 333.2 mt, respectively, with the St. Lucie River Watershed
145 contributing the majority of these loads (64.0 and 74.9 percent, respectively) and the lake
146 contributing the remainder. Again, the majority of these nutrient loads to the SLE unusually
147 were delivered in the dry season. Notably, in WY2016, annual mean oyster larval
148 recruitment was the highest over the past 10 water years, and continued to support natural
149 recovery of oyster populations within the SLE despite extremely low salinities at times.

150 • **Caloosahatchee River Estuary (CRE).** In WY2016, annual rainfall in the Caloosahatchee
151 River Watershed (60.19 inches or 152.9 cm) was higher than last year (29 percent) and the
152 long-term average (22 percent). Due to El Niño conditions, dry season rainfall was nearly
153 two times the levels observed over the past two years. Total freshwater inflow to the CRE
154 was 2.38 million ac-ft (2,936 million m³), with 35.7 percent from Lake Okeechobee,
155 40.3 percent from the C-43 Basin, and 24.0 percent from the Tidal Basin. The majority of
156 inflow from the lake (87.3 percent) was released in the dry season, contrasting with the
157 more typical patterns of higher wet season flows observed in recent years. At the Ft. Myers
158 station, salinities were favorable for the estuary, as both the daily average salinity goal and
159 30-day moving average goal were fully achieved this water year. TN and TP loadings to
160 the SLE were 3566.5 mt and 301.7 mt, respectively, with Lake Okeechobee contributing
161 most of the annual TN load (44.6 percent) and the C-43 basin contributing most of the
162 annual TP load (46.4 percent). Similar to the SLE, more than half of the total nutrient
163 loading in WY2016 (67.7 percent of TN and 59.2 percent of TP) atypically occurred
164 in the dry season. Density of live oyster continued to remain high at the Bird Island site
165 and notably rebounded further upstream at the Iona Cove site (0 per square meter [m²] in
166 WY2014 to 1,552/m² in WY2016.

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NORTHERN EVERGLADES AND ESTUARIES PROTECTION PROGRAM OVERVIEW

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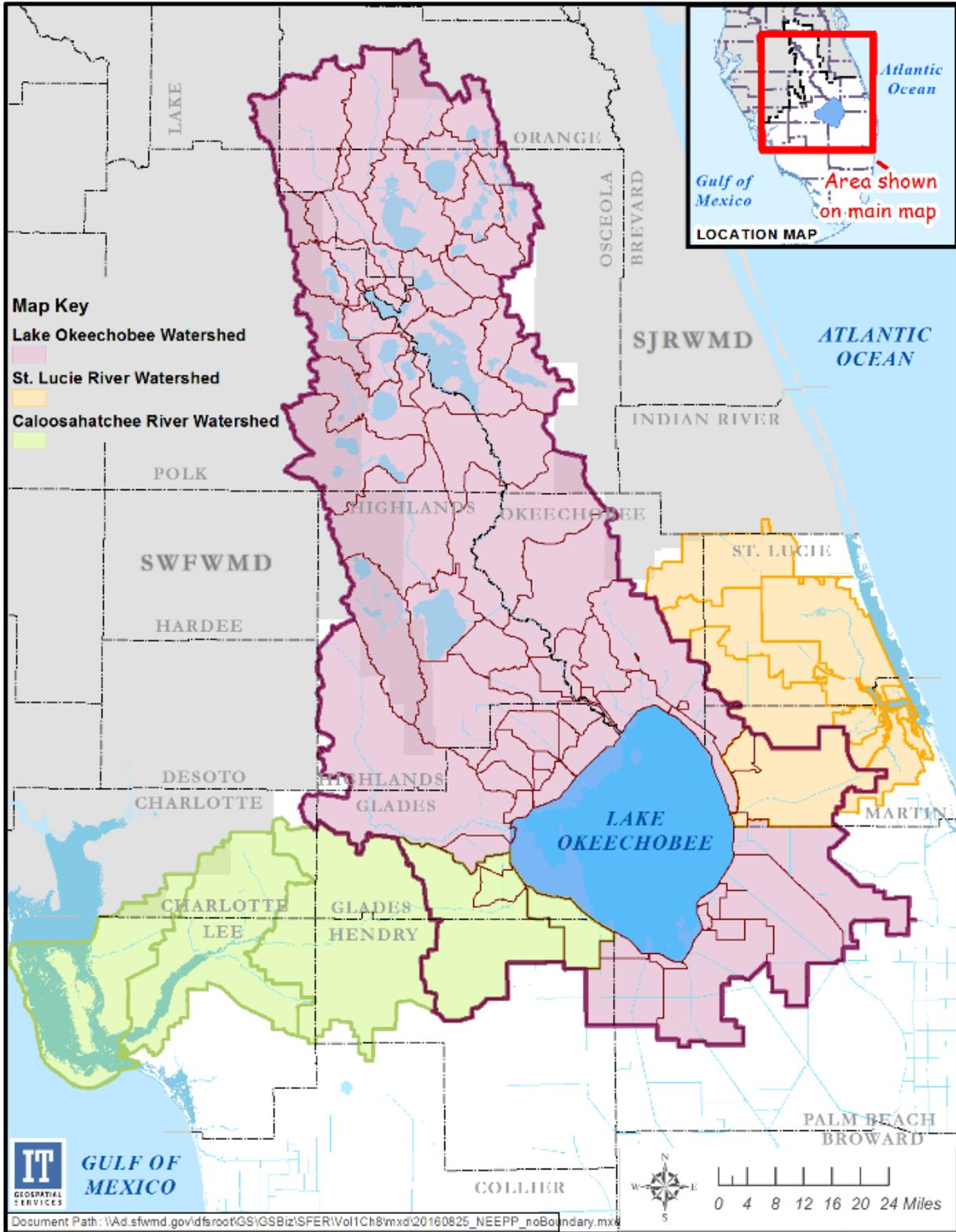
170 The St. Lucie and Caloosahatchee River watersheds and estuaries are located on the southern peninsula
171 of Florida. Together with the Lake Okeechobee Watershed, they represent major overall region known as
172 the Northern Everglades (Figure 8A-1) The St. Lucie Watershed lies to the east of Lake Okeechobee and
173 the Caloosahatchee River Watershed to the west. Overall, the Northern Everglades is a highly modified
174 system as it is part of the larger overall Central and South Florida Flood Control (C&SF) Project.
175 Importantly, the western part of the St. Lucie Watershed (C-44/S-153) and the eastern portion of the
176 Caloosahatchee River Watershed (C-43 East) have the ability to drain either into Lake Okeechobee or into
177 their respective estuaries. More detailed subwatershed maps are shown in Figure 8B-1 for the Lake
178 Okeechobee Watershed, Figure 8C-2 for the St. Lucie River Watershed, and Figure 8C-14 for the
179 Caloosahatchee River Watershed.

180 In 2007, the Florida legislature amended the Lake Okeechobee Protection Act to the Northern
181 Everglades and Estuaries Protection Program (NEEPP; Section 373.4595, F.S.). NEEPP promotes a
182 comprehensive, interconnected watershed approach to protect Lake Okeechobee and the St. Lucie and
183 Caloosahatchee rivers and their watersheds, and includes the Lake Okeechobee, St. Lucie River, and
184 Caloosahatchee Watershed Protection Programs (WPPs), respectively. The WPPs developed pursuant
185 to NEEPP for each of the three Northern Everglades watersheds identify actions (i.e., programs and
186 projects) to help in achieving water quality and quantity objectives for the watersheds and to restore
187 habitat and, importantly, these are the basis for FDEP’s BMAPs in the respective areas (FDEP 2014, 2013,
188 2012, respectively).

189 The District, in cooperation with FDEP and FDACS—collectively known as the coordinating
190 agencies—developed the *Lake Okeechobee Protection Plan* in accordance with NEEPP. The *Lake*
191 *Okeechobee Protection Plan* was originally submitted to the Florida legislature in 2004 (SFWMD et al.
192 2004), followed by submittals of the *Lake Okeechobee Watershed Construction Project Phase II Technical*
193 *Plan* in February 2008 (SFWMD et al. 2008) and three-year Lake Okeechobee Watershed Protection Plan
194 (LOWPP) evaluations in 2011 (SFWMD et al. 2011) and 2014 (Bertolotti et al. 2014) in accordance with
195 NEEPP. Per current NEEPP requirements, the focus of the LOWPP includes the Watershed Construction
196 Project, and the Research and Water Quality Monitoring Program (Paragraph 373.4595(3)(a), F.S.).

197 The original *St. Lucie River Watershed Protection Plan* (SLRWPP) and *Caloosahatchee River*
198 *Watershed Protection Plan* (CRWPP) were completed and submitted to the Florida legislature in 2009
199 (SFWMD et al. 2009a, b) by the coordinating agencies, with significant stakeholder input. Three-year
200 updates for the RWPPs were done in 2012 (Bertolotti and Balci 2012, Balci and Bertolotti 2012) and 2015
201 (Buzzelli et al. 2015). These plans aim to minimize the undesirable flows and improve the quality of water
202 delivered to the St. Lucie and Caloosahatchee river estuaries through implementation of the respective River
203 Watershed Construction Projects and Research and Water Quality Monitoring Programs (Paragraphs
204 373.4595(4)(a) and (c), F.S. respectively).

205 The coordinating agencies are jointly responsible for implementing NEEPP, each with specific areas
206 of responsibility. FDEP’s BMAPs in the Northern Everglades serve as the overarching water quality
207 restoration plans. Other major responsibilities of the coordinating agencies include implementation of urban
208 and agricultural BMPs, identification and implementation of water quality and quantity projects, and
209 reporting and maintaining a monitoring network. SFWMD, in cooperation with FDEP and FDACS,
210 is the lead agency for the annual progress report, while each agency is responsible for implementing its
211 respective programs.



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Figure 8A-1. The Northern Everglades watersheds: Lake Okeechobee, St. Lucie River, and Caloosahatchee River.

215 During the 2016 legislative session, the Florida legislature amended NEEPP (under Chapter 2016-1,
216 Laws of Florida, effective July 1, 2016) to emphasize FDEP’s BMAPs and to further define roles and
217 responsibilities, coordination, implementation, and reporting efforts among the coordinating agencies.
218 Jointly, the Northern Everglades regional efforts will enhance restoration currently under way in the
219 Everglades south of Lake Okeechobee. Together, NEEPP builds upon ongoing restoration efforts north of
220 Lake Okeechobee and in the river watersheds by identifying and implementing programs and projects
221 necessary to achieve water quality and quantity objectives for the watersheds. This chapter, in conjunction
222 with Chapters 8B and 8C of this volume (Watershed Research and Water Quality Monitoring Results and
223 Activities for the lake and estuaries, respectively), fulfills the specific reporting requirements outlined in
224 NEEPP for the annual progress report (Note: see footnote below for units of measurement reporting in this
225 chapter⁷). Further details on the Northern Everglades Program is also available on the District’s webpage
226 at www.sfwmd.gov/northerneverglades.

227 RESTORATION ACTIVITIES

228 FDEP BASIN MANAGEMENT ACTION PLANS UPDATE

229 Florida Department of Environmental Protection²

230 Basin management action plans (BMAPs) are "blueprints" for restoring impaired waters by reducing
231 pollutant loadings to meet the allowable loadings established in a total maximum daily load (TMDL).
232 They represent a comprehensive set of strategies—permit limits on wastewater facilities, urban and
233 agricultural BMPs, conservation programs, financial assistance and revenue generating activities,
234 etc.—designed to implement pollutant reductions established by TMDLs. These broad-based plans are
235 developed with local stakeholders; they rely on local input and local commitment, and are adopted by
236 Secretarial Order to be enforceable. TMDL documents are available on the FDEP’s web page at
237 http://www.dep.state.fl.us/water/tmdl/final_tmdl.htm.

238 BMAP updates are provided annually through a public meeting and progress report. Meeting and
239 reporting dates are unique to each BMAP, and are based on the date the Secretarial Order was issued for
240 adoption. Adopted BMAP and progress reports are available on the FDEP’s BMAP web page at
241 www.dep.state.fl.us/water/watersheds/bmap.htm.

242 A public meeting was held for the Lake Okeechobee BMAP on May 3, 2016, and the *Final 2015*
243 *Progress Report for the Lake Okeechobee Basin Management Action Plan* was completed in July 2016
244 (FDEP 2016b). The Caloosahatchee Estuary BMAP public meeting was held on March 30, 2016, and the
245 *Final 2015 Progress Report for the Caloosahatchee Estuary Basin Management Action Plan* was
246 completed in June 2016 (FDEP 2016a). For the St. Lucie River and Estuary BMAP, the annual public
247 meeting will be held in October 2016, and the *Final 2016 Progress Report for the St. Lucie River and*

⁷ For the Northern Everglades, the units of measurement in this chapter are reported dually in both United States Customary and International System (SI) units, including acres (ac)/hectares (ha) for area, acre-feet (ac-ft)/cubic meters (m³) for volume, cubic feet per second (cfs)/cubic meters per second (m³/s) for flow rate, feet (ft)/meters (m) for depth, inches (in)/centimeters (cm) for rainfall, and pounds per acre (lb/ac)/kilograms per hectare (kg/ha) for unit load; also, consistent with the BMAPs, FDEP annual load reductions are shown as lbs/yr (with kg/yr conversion). The Lake Okeechobee TMDL and associated BMAP documents refer to the “annual load of 140 metric tons of phosphorus to Lake Okeechobee to achieve an in-lake target phosphorus concentration of 40 ppb.” In line with this NEEPP reporting, annual loads are shown as metric tons per year (mt/yr). For water quality data, TN and TP concentrations are reported in milligrams per liter (mg/L) and micrograms per liter (µg/L), respectively; ppm and ppb also may be shown dually, particularly in presentation of tables and figures as appropriate. Reported units for abundances or biovolumes of various biological data are presented in SI units. Also, refer to the *Units of Measurement* table in front matter of the overall 2017 SFER.

248 *Estuary Basin Management Action Plan* will be completed by December 2016 (FDEP 2016c). Highlights
249 of these latest progress reports are provided below. For further details on the status of the BMAPs, the
250 complete annual progress reports can be downloaded from the BMAP webpage.

251 **Lake Okeechobee Basin**

252 ***Progress towards the TMDL***

253 In 2001, FDEP adopted the TP TMDL for Lake Okeechobee (FDEP 2001) after nine segments in Lake
254 Okeechobee were identified as impaired by TP. The TMDL is a total annual phosphorus load to Lake
255 Okeechobee of 140 mt/yr, of which 35 mt/yr are estimated to fall directly on the lake through atmospheric
256 deposition. The remaining 105 mt/yr of TP are allocated to the entire LOW, which consists of nine
257 subwatersheds (**Figure 8A-2**). The attainment of the TMDL will be calculated using a five-year rolling
258 average of monthly loads calculated from measured flow and concentration values.

259 The Lake Okeechobee BMAP was adopted in December 2014 to implement the TP TMDL in the
260 watershed (FDEP 2014). The first annual progress report for the Lake Okeechobee BMAP was completed
261 in July 2016, which describes the activities that occurred during the BMAP reporting period from January
262 1, 2015 to December 31, 2015.

263 ***Activities during the BMAP Reporting Period***

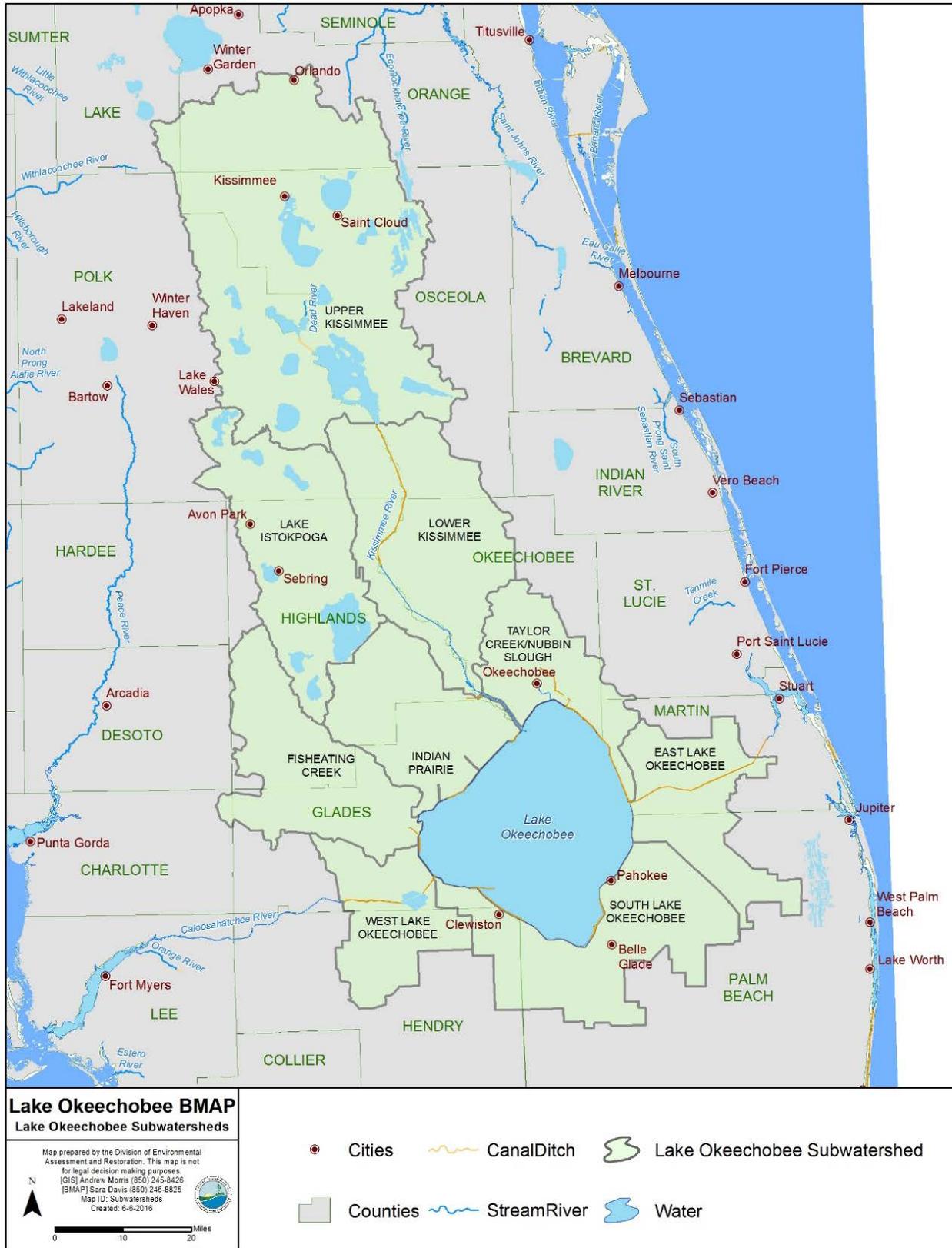
264 During the year following BMAP adoption, numerous efforts to help improve water quality in the LOW
265 have progressed. The Florida Department of Transportation began construction on 6 projects and added 2
266 new projects in the LOW. Also, the City of Orlando completed 1 project, Orange County added 4 new
267 projects, and Spring Lake Improvement District added 1 project to their plans. Counties, municipalities,
268 and other stakeholders continued to plan and implement water quality projects and management strategies
269 in the watershed. In addition to site-specific projects, the coordinating agencies together have continued
270 work on other initiatives that will achieve nutrient reductions in the LOW.

271 SFWMD was involved in numerous restoration activities in the LOW. Regional projects with both
272 water storage and water quality benefits also progressed. These included initiating construction of the
273 southern STA for the Lakeside Ranch STA – Phase II and the Rolling Meadows Wetland Restoration –
274 Phase I projects; continuing construction activities for the KRRP (Reach 3 backfilling); and continuing
275 operations of the Lakeside Ranch STA (Phase I), Taylor Creek STA, and Nubbin Slough STA projects.

276 ***Summary of Load Reductions***

277 Phase I of the Lake Okeechobee BMAP will be carried out over a period of 10 years. As this reporting
278 reflects activities only one year into the 10-year phase, reductions beyond those included in the BMAP are
279 not quantified or included in this report. The BMAP focuses on efforts completed, planned, or ongoing
280 since 2009, and includes projects in the six northern subwatersheds that will achieve a TP reduction of
281 approximately 145.8 to 148.1 mt/yr. Of this, a 100.0 mt/yr reduction will be achieved through projects that
282 will be completed, and the remaining 45.81 to 48.13 mt reduction will be completed after further
283 development. Much of the progress tracked over the first year of BMAP implementation has been on larger-
284 scale initiatives and projects.

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Figure 8A-2. Lake Okeechobee BMAP area (reprint of Figure ES-1, FDEP 2016a, with permission).

289 **St. Lucie River and Estuary Basin**

290 ***Progress towards the TMDL***

291 In 2009, FDEP adopted the St. Lucie River and Estuary TMDL for nutrients (TP and TN) and
292 dissolved oxygen (FDEP 2008). The St. Lucie River and Estuary BMAP was adopted in June 2013 (FDEP
293 2013) to implement the nutrient TMDLs in the basin. The BMAP and this reporting focus on the efforts in
294 the St. Lucie Basin (**Figure 8A-3**), as the upstream loads from Lake Okeechobee are being addressed
295 separately via the Lake Okeechobee BMAP.

296 The St. Lucie River and Estuary BMAP includes basin stormwater management strategies and projects
297 that have been put in place since 2000 or will be implemented by the responsible entities during the first
298 five years of implementation (July 2013–June 2018). For the St. Lucie River and Estuary BMAP, the annual
299 public meeting will be held in October 2016, and the 2016 progress report will be completed by December
300 2016. This third annual progress report for the St. Lucie River and Estuary BMAP describes the
301 implementation activities that occurred during the BMAP reporting period (July 1, 2015 to June 30, 2016).

302 ***Activities during the BMAP Reporting Period***

303 During the BMAP reporting period, FDACS adopted two BMP manuals (FDACS 2015a, b) and
304 continued enrolling landowners into the BMP program. The City of Port St. Lucie, City of Stuart, St. Lucie
305 County, and Town of Sewall's Point each completed one project; and the Florida Department of
306 Transportation completed two projects.

307 ***Summary of Load Reductions***

308 The projects completed during this third annual BMAP reporting period resulted in an estimated
309 reduction of 7,495 lbs/yr (3,400 kg/yr) of TN and 2,199 lbs/yr (997 kg/yr) of TP. The total estimated
310 reductions to date, including those quantified prior to BMAP adoption and in previous annual reports, are
311 519,571 lbs/yr (235,673 kg/yr) of TN and 138,740 lbs/yr (62,931 kg/yr) of TP. This total is greater than the
312 reductions required in the first BMAP phase.

313 **Figures 8A-4** and **8A-5** show the progress towards the load reductions for the TN and TP TMDLs in
314 the St. Lucie River and Estuary Basin, respectively, through June 30, 2016. The first bar in these figures
315 shows the baseline load, the second bar shows the current estimated loading with the implementation of
316 projects, and the third bar shows the total allocation to meet the TMDLs. The horizontal line shows the
317 target for the first BMAP phase.

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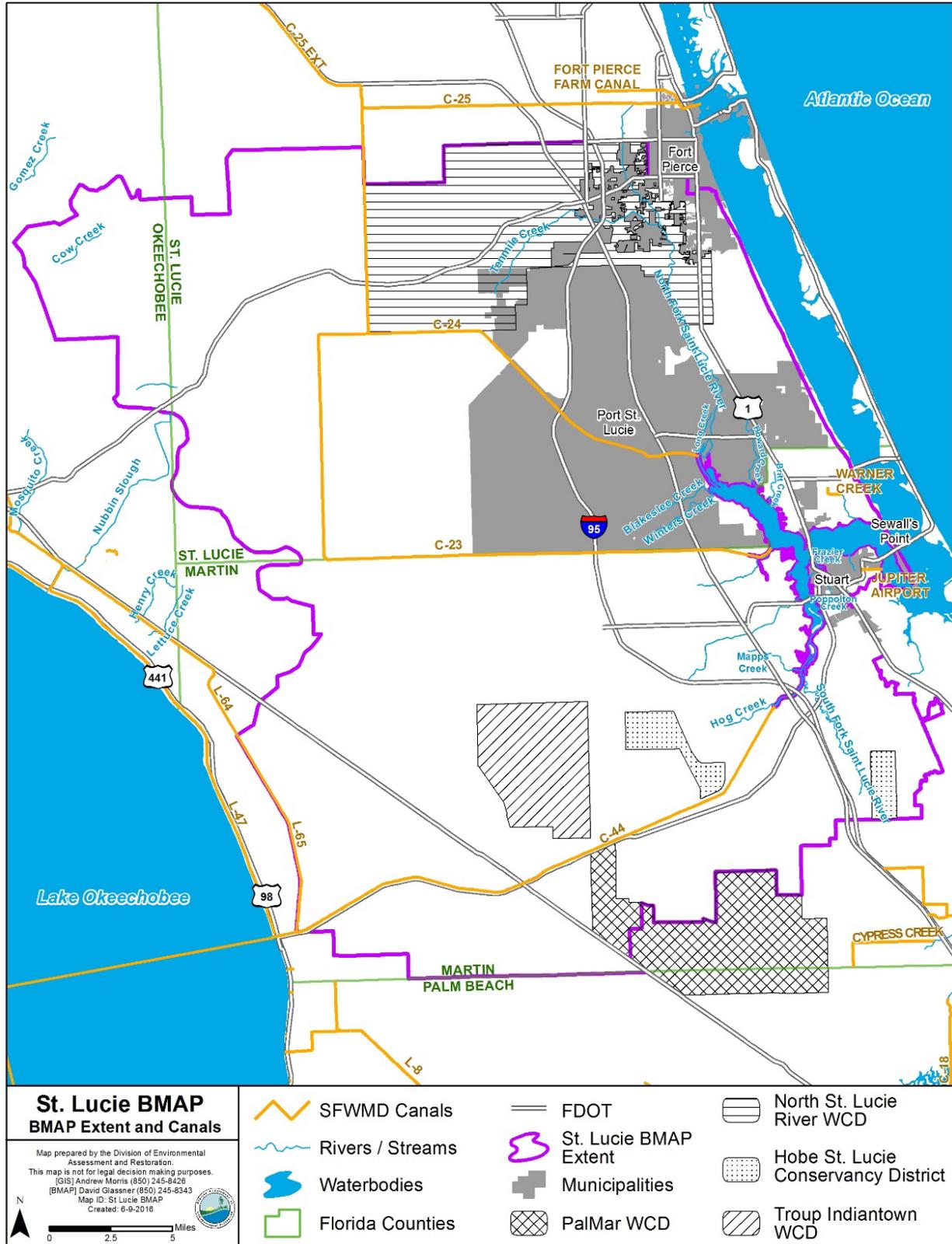
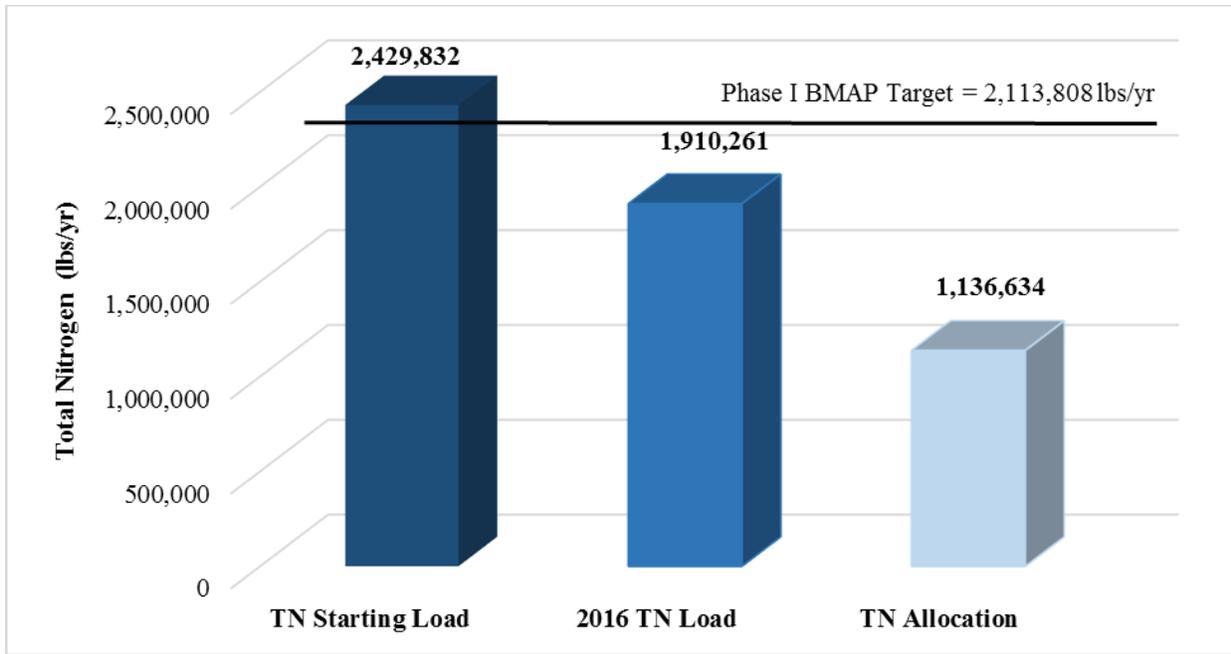


Figure 8A-3. St. Lucie River BMAP area (reprint of Figure 1, FDEP 2016c, with permission).

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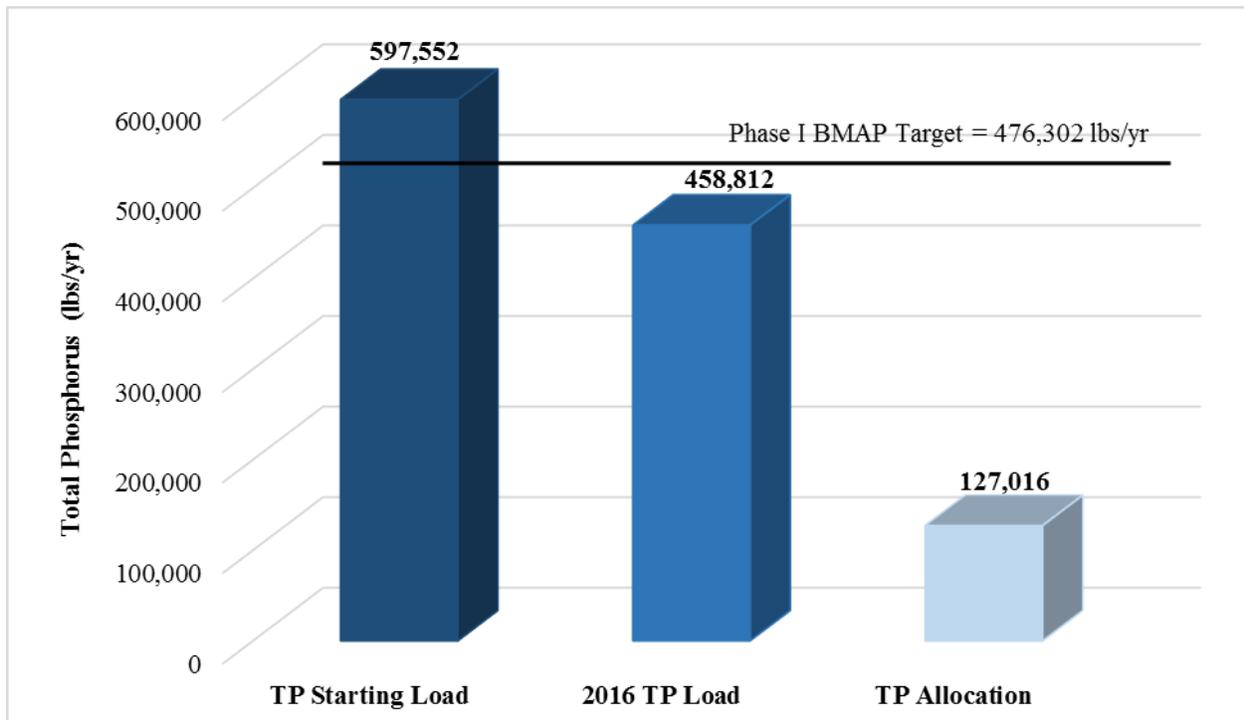
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Figure 8A-4. Progress toward the St. Lucie River and Estuary TN TMDL through June 30, 2016 (reprint of Figure 4, FDEP 2016c, with permission).

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Figure 8A-5. Progress toward the St. Lucie River and Estuary TP TMDL through June 30, 2016 (reprint of Figure 5, FDEP 2016c, with permission).

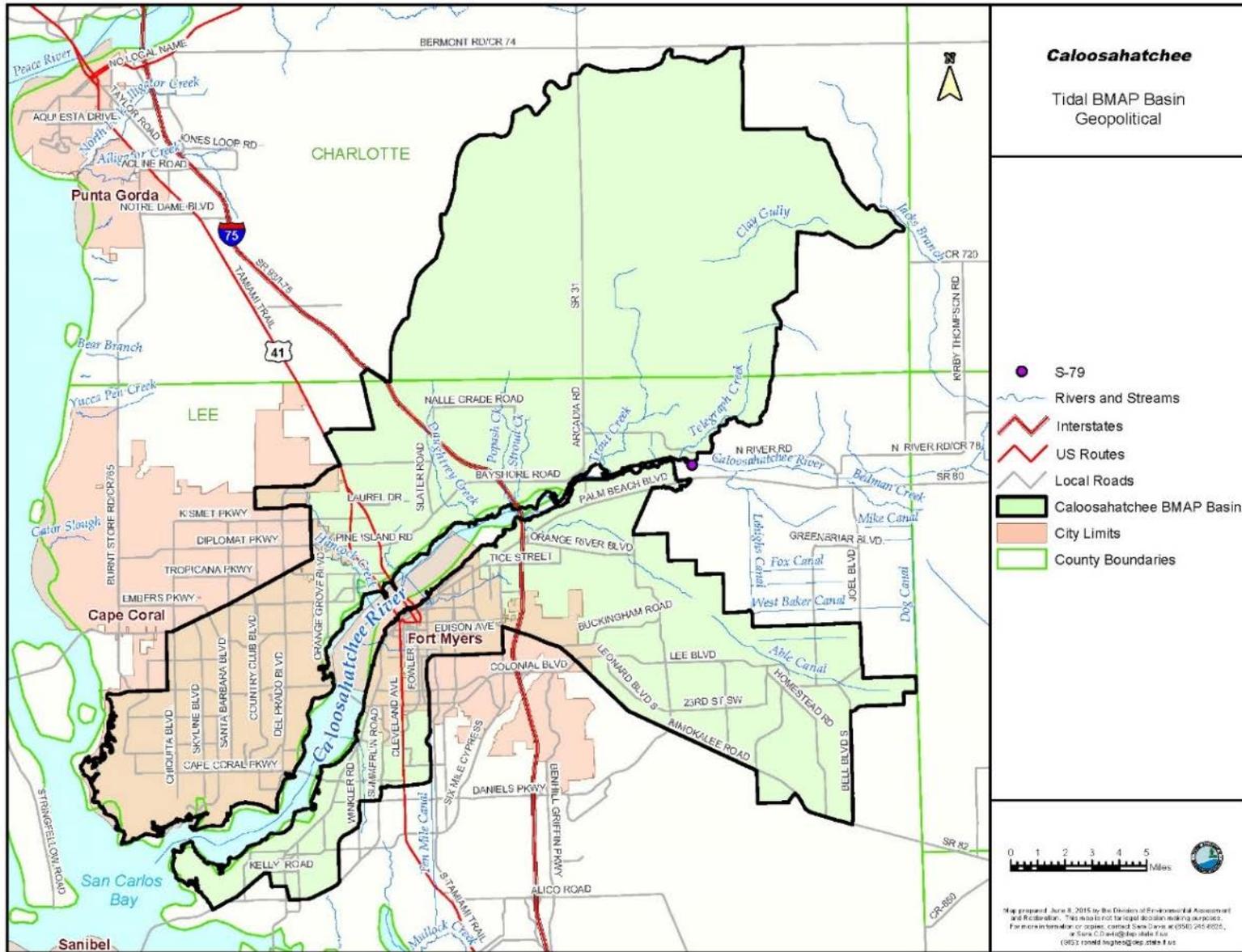
329 ***Water Quality Evaluation***

330 The water quality section of the progress report addresses the methodology used to analyze the station
331 at Roosevelt Bridge and the other stations in the BMAP monitoring network. The adopted BMAP outlines
332 the monitoring network, which includes monitoring efforts from stakeholders such as SFWMD, Port St.
333 Lucie, North St. Lucie Water Control District, United States Geological Survey, and others. The adopted
334 BMAP calls for a more detailed water quality analysis to be included as part of the fourth annual progress
335 report. At this time, FDEP is initiating the discussion of the water quality evaluation, beginning the process
336 of developing the method of analysis, and receiving feedback from stakeholders. At a minimum, FDEP will
337 examine the Roosevelt Bridge station data (Station SE03, which is also the TMDL compliance point) and
338 will work with stakeholders to identify other locations for future analyses. Beginning the process now, in
339 advance of the 2017 date, will provide a more useful and complete water quality analysis, as required in the
340 adopted BMAP.

341 **Caloosahatchee Estuary Basin**

342 ***Progress towards the TMDL***

343 FDEP has identified the Caloosahatchee Estuary as impaired by nutrients (chlorophyll *a*). In December
344 2009, FDEP adopted the Caloosahatchee Estuary TMDL for TN (FDEP 2009), which is linked to high
345 chlorophyll *a* concentrations in the CRE downstream of the Franklin Lock and Dam. The Caloosahatchee
346 Estuary BMAP was adopted in November 2012 (FDEP 2012) to implement the TN TMDL in the watershed
347 (**Figure 8A-6**). The third annual Progress Report for the Caloosahatchee Estuary BMAP was completed in
348 June 2016, and it describes the activities that occurred during the BMAP reporting period from December
349 1, 2014 to November 30, 2015.



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351

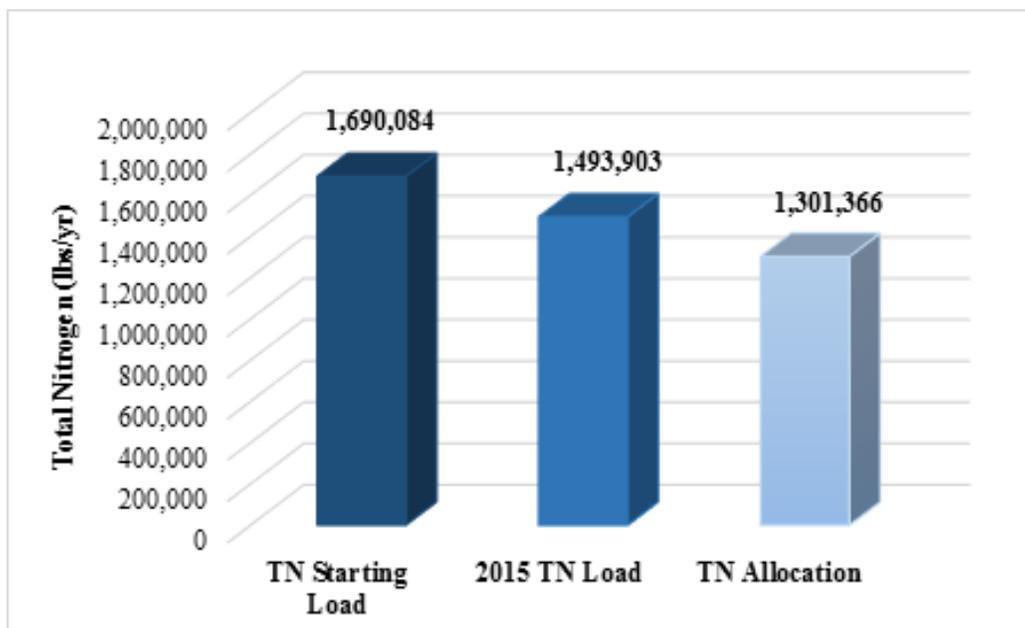
Figure 8A-6. Caloosahatchee Estuary BMAP area (reprint of Figure 1, FDEP 2016a, with permission).

352 **Activities during the BMAP Reporting Period**

353 During the BMAP reporting period, in addition to the ongoing projects and programs, the City of Cape
 354 Coral completed a septic-to-sewer project and the City of Fort Myers completed the Ford Street Preserve
 355 project, resulting in a reduction of 7,293 lbs/yr (3,308 kg/yr) of TN. In addition, the reductions from
 356 agricultural BMP implementation during the BMAP reporting period are 16,696 lbs/yr (7,573 kg/yr) of TN.

357 **Summary of Load Reductions**

358 The reductions described here are in addition to those projects given credit before BMAP adoption and
 359 in previous annual reports. Therefore, the total reductions to date are 196,181 lbs/yr (88,986 kg/yr)
 360 of TN, or 50 percent of the reductions needed to meet the portion of the TMDL allocated to the
 361 Caloosahatchee Estuary Basin. **Figure 8A-7** shows progress towards the TN TMDL load reductions
 362 through November 30, 2015.



363
 364 **Figure 8A-7.** Progress towards the Caloosahatchee TN TMDL through
 365 November 30, 2015 (reprint of Figure ES-1, FDEP 2016a, revised with permission).

366 **Water Quality Monitoring**

367 Local entities (Cape Coral, Fort Myers, and Lee County) continued water quality monitoring consistent
 368 with the BMAP. The District continued monitoring 10 stations in the BMAP’s monitoring plan, and FDEP
 369 continued monitoring at 15 stations.

370

371 WATERSHED CONSTRUCTION PROJECTS UPDATE

372 Addressing the complex and varying problems in the Northern Everglades watersheds necessitates a
373 multifaceted restoration approach, and reducing nutrient loading and excess freshwater discharge and
374 inflow to the SLE, CRE, and Lake Okeechobee requires action at regional, subregional, and local levels.
375 NEEPP Construction Project components in combination with FDEP’s BMAPs⁸ include a suite of activities
376 at each of these spatial scales. The focus on water quality and storage is intended to improve hydrology,
377 water quality, and aquatic habitats in both the watersheds and receiving waters. The suite of projects builds
378 upon the BMP Program focused on retaining nutrients at the source and comprises water quality and
379 quantity projects. The coordinating agencies are committed to restoring the Northern Everglades
380 watersheds, continuing existing efforts, and identifying new opportunities to improve ecosystems. This
381 section provides an update to the NEEPP Construction Project activities, including continued DWM
382 Program efforts, accomplished during the WY2016 reporting period.

383 Dispersed Water Management Program Update

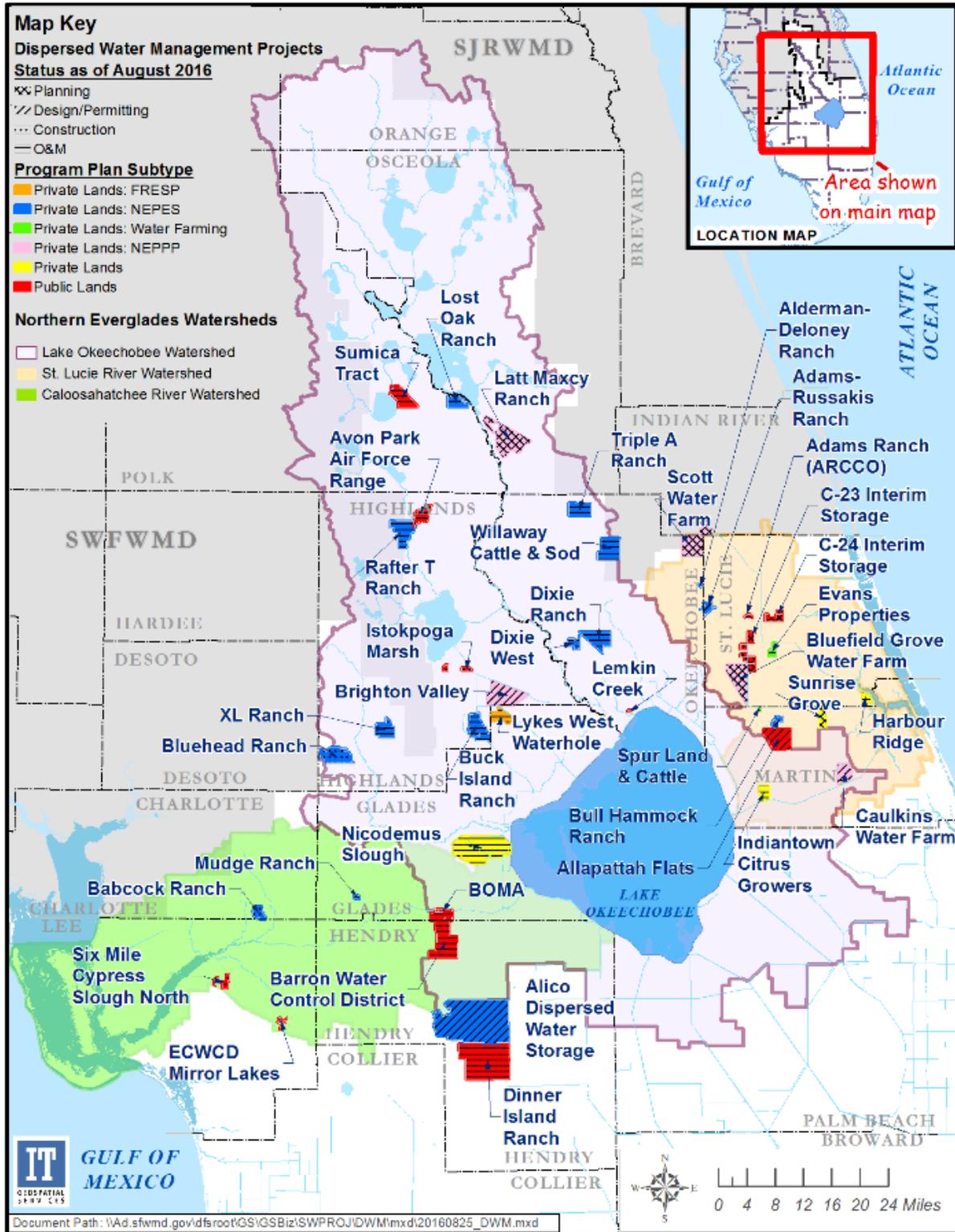
384 The legislative intent of NEEPP includes encouraging and supporting the development of creative
385 partnerships to facilitate or further the restoration of surface water resources in the Lake Okeechobee
386 Watershed and the St. Lucie and Caloosahatchee river watersheds. One way this is being accomplished is
387 through the Dispersed Water Management (DWM) Program. The goals and objectives of the DWM
388 Program are to provide shallow water storage, retention, and detention to enhance Lake Okeechobee and
389 estuary health by reducing discharge volumes, reducing nutrient loading to downstream receiving waters,
390 and expanding groundwater recharge opportunities.

391 The DWM Program is a multifaceted approach to working cooperatively with public and private land
392 owners to identify, plan, and implement mechanisms to retain or store water. Under this program, there are
393 several subcategories of DWM projects including Florida Ranchlands Environmental Services Project
394 (FRESP), Northern Everglades Payment for Environmental Services – Solicitation 1 (NE-PES-1), Northern
395 Everglades Payment for Environmental Services – Solicitation 2 (NE-PES-2), Water Farming, Northern
396 Everglades Public-Private Partnerships (NE PPP), District Lands, Other Governmental Lands, Wetland
397 Reserve Program (WRP), and other projects. The storage, retention, and detention created by the
398 40 completed and operational projects (21 in Lake Okeechobee, 13 in St. Lucie River, and 6 in
399 Caloosahatchee River watersheds) within the DWM Program through WY2016 is approximately 91,662
400 ac-ft/yr (113 million m³/yr). This includes contributions from the United States Department of Agriculture
401 Natural Resources Conservation Service (USDA-NRCS) Wetland Reserve Program (WRP) and other
402 programs, the FDACS BMP Program, agricultural landowners, agricultural organizations, non-
403 governmental organizations, and local governments.

404 A map of the DWM projects is shown in **Figure 8A-8**. The comprehensive list of the District’s DWM
405 projects in the Northern Everglades and their current status and estimated benefits, through the end of
406 WY2016, is shown in **Table 8A-1**. The District administers the DWM Program in consultation with FDEP,
407 FDACS, and USDA-NRCS.

408

⁸ Note that local projects previously covered in the Watershed Construction Projects are presently captured in FDEP’s Northern Everglades BMAPs (FDEP 2012, 2013, 2014).



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Figure 8A-8. DWM projects located in the Northern Everglades, including Water Storage on Private and Public Lands, Northern Everglades Payment for Environmental Services, Florida Ranchlands Environmental Services, and Water Farming Payment for Environmental Services Pilot projects. [Note: Dinner Island Ranch in the Southern Everglades is also shown.]

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Table 8A-1. Comprehensive list of SFWMD’s DWM projects located in the Northern Everglades and their status and estimated storage benefits, through the end of WY2016. [Note: Gov – government and WMA – Water Management Alternative.]

Project Name	Watershed	Drainage Basin	Category	Status	Estimated Storage Benefits (ac-ft/yr)
Lykes West Waterhole	Lake Okeechobee	C-41N, C-40	FRESP	Operation & Maintenance	4,848
Buck Island Ranch (NE PES-1)	Lake Okeechobee	C-41N	NE-PES-1	Operation & Maintenance	1,573
Dixie Ranch	Lake Okeechobee	S-154	NE-PES-1	Operation & Maintenance	856
Dixie West	Lake Okeechobee	S-65E	NE-PES-1	Operation & Maintenance	315
Lost Oak Ranch (aka Shady Oaks Ranch)	Lake Okeechobee	LAKE KISSIMMEE	NE-PES-1	Operation & Maintenance	374
Triple A Ranch	Lake Okeechobee	S-65BC	NE-PES-1	Operation & Maintenance	397
Willaway Cattle and Sod	Lake Okeechobee	S-65D	NE-PES-1	Operation & Maintenance	229
XL Ranch	Lake Okeechobee	FISHEATING CREEK/L-61	NE-PES-1	Operation & Maintenance	887
Bluehead Ranch	Lake Okeechobee	FISHEATING CREEK/L-61	NE-PES-2	Construction	3,462
Buck Island Ranch WMA (NE PES-2)	Lake Okeechobee	C-41N	NE-PES-2	Operation & Maintenance	620
Rafter T Ranch WMA (NE PES-2)	Lake Okeechobee	ARBUCKLE CREEK	NE-PES-2	Operation & Maintenance	1,298
Brighton Valley DWM	Lake Okeechobee	C-41N	NE PPP	Planning	34,000
Latt Maxcy Ranch DWM	Lake Okeechobee	S-65A	NE PPP	Planning	30,500
Lemkin Creek	Lake Okeechobee	S-133	District Lands	Planning	-
Nicodemus Slough	Lake Okeechobee	NICODEMUS SLOUGH NORTH	Other	Operation & Maintenance	33,860
Avon Park Airforce Range	Lake Okeechobee	ARBUCKLE CREEK	Other Gov Lands	Operation & Maintenance	10,000
Istokpoga Marsh	Lake Okeechobee	C-41N	Other Gov Lands	Design/Permitting	950
Sumica Tract	Lake Okeechobee	LAKE WEOHYAKAPKA, TIGER LAKE	Other Gov Lands	Operation & Maintenance	281
Boney Ranch Wetland Reserve	Lake Okeechobee	FISHEATING CREEK/L-61	WRP	Operation & Maintenance	300
Buck Island Ranch A, B and C	Lake Okeechobee	C-41N	WRP	Operation & Maintenance	62
Francis Creek	Lake Okeechobee	FISHEATING CREEK/L-61	WRP	Operation & Maintenance	47
Lake Wales Ridge State Forest	Lake Okeechobee	LAKE ISTOKPOGA	WRP	Operation & Maintenance	220
Lazy O Ranch	Lake Okeechobee	S-65E, S-154	WRP	Operation & Maintenance	250
Mary's Creek	Lake Okeechobee	FISHEATING CREEK/L-61	WRP	Operation & Maintenance	208
Payne and Son Ranch	Lake Okeechobee	FISHEATING CREEK/L-61	WRP	Operation & Maintenance	932
Williamson Cattle Company	Lake Okeechobee	S-191	WRP	Operation & Maintenance	150
<i>Subtotal Lake Okeechobee Watershed</i>					126,619

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Table 8A-1. Continued.

Project Name	Watershed	Drainage Basin	Category	Status	Estimated Storage Benefits (ac-ft/yr)
Alderman-Deloney Ranch	St. Lucie	C-25	NE-PES-1	Operation & Maintenance	147
Adams - Russakis Ranch WMA	St. Lucie	C-24	NE-PES-2	Design/Permitting	508
Bull Hammock Ranch, LTD WMA	St. Lucie	C-23	NE-PES-2	Operation & Maintenance	228
Bluefield Grove Water Farm	St. Lucie	C-23	NE PPP	Planning	32,000
Caulkins Water Farm Expansion	St. Lucie	C-44	NE PPP	Planning	50,000
Scott Water Farm	St. Lucie	C-25	NE PPP	Planning	33,000
Caulkins	St. Lucie	C-44	Water Farming	Operation & Maintenance	6,780
Evans Properties (Alt. E-1)	St. Lucie	C-24	Water Farming	Operation & Maintenance	3,635
Spur Land & Cattle / Bull Hammock Ranch	St. Lucie	C-23	Water Farming	Operation & Maintenance	870
Adams Ranch Cattle and Citrus Operations (ARCCO) (C-23/C-24 Complex)	St. Lucie	C-24	District Lands	Operation & Maintenance	190
Allapattah Parcel C	St. Lucie	C-23	District Lands	Design/Permitting	-
C-23 Interim Storage (Section C)	St. Lucie	C-23, C-24	District Lands	Construction	212
C-23 Interim Storage (Section D - PC55)	St. Lucie	C-23, C-24	District Lands	Planning	110
C-24 Interim Storage	St. Lucie	C-24	District Lands	Planning	-
Harbour Ridge	St. Lucie	ST. LUCIE NORTH FORK	Other	Operation & Maintenance	667
Indiantown Citrus Growers Phase I and II	St. Lucie	C-44	Other	Operation & Maintenance	3,550
Allapattah H Canal	St. Lucie	C-23	WRP	Operation & Maintenance	1,610
Allapattah Parcels A and B - Phase I	St. Lucie	C-23	WRP	Design/Permitting	3,500
Allapattah Parcels A and B - Phase II	St. Lucie	C-23	WRP	Design/Permitting	1,243
Audubon Loop	St. Lucie	SOUTH MID- ESTUARY	WRP	Operation & Maintenance	24
Pal-Mar East	St. Lucie	GROVE	WRP	Operation & Maintenance	2,000
Williamson Ranch/Turnpike Dairy	St. Lucie	C-23	WRP	Operation & Maintenance	547
Winding Waters Natural Area	St. Lucie	C-17	WRP	Operation & Maintenance	46
<u>Subtotal St. Lucie River Watershed</u>					140,867

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Table 8A-1. Continued.

Project Name	Watershed	Drainage Basin	Category	Status	Estimated Storage Benefits (ac-ft/yr)
Alico Ranch WMA	Caloosahatchee	EAST CALOOSAHATCHEE, OKALOACOCHEE, C-139	NE-PES-2	Design/Permitting	91,944
Babcock Ranch WMA	Caloosahatchee	TIDAL NORTH	NE-PES-2	Construction	1,214
Mudge Ranch	Caloosahatchee	WEST CALOOSAHATCHEE	NE-PES-2	Operation & Maintenance	396
Alico DWS (NE PPP)	Caloosahatchee	EAST CALOOSAHATCHEE, OKALOACOCHEE, C-139	NE PPP	Planning	0
BOMA	Caloosahatchee	EAST CALOOSAHATCHEE	District Lands	Operation & Maintenance	5,250
Barron Water Control District	Caloosahatchee	EAST CALOOSAHATCHEE	Other Gov Lands	Operation & Maintenance	5,000
ECWCD Mirror Lakes/Halfway Pond Phase I	Caloosahatchee	TIDAL SOUTH	Other Gov Lands	Operation & Maintenance	1,000
ECWCD Mirror Lakes/Halfway Pond Phase II	Caloosahatchee	TIDAL SOUTH	Other Gov Lands	Design/Permitting	500
ECWCD Mirror Lakes/Halfway Pond Phase III	Caloosahatchee	TIDAL SOUTH	Other Gov Lands	Planning	2,000
Six Mile Cypress Slough North	Caloosahatchee	TIDAL SOUTH	Other Gov Lands	Operation & Maintenance	1,400
Spirit of the Wild Management Area	Caloosahatchee	WEST CALOOSAHATCHEE	WRP	Operation & Maintenance	615
<i>Subtotal Caloosahatchee River Watershed</i>					<i>109,319</i>
<i>Total for Northern Everglades</i>					<i>376,805</i>

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Note: In the Southern Everglades, the DWM Dinner Island Ranch Project is operational, with an estimated storage benefit of 30 ac-ft/yr. This DWM project is located in the C-139 Basin and provides water retention in the Everglades subbasin.

421 ***Storage and Retention Projects on Public Lands***

422 Projects on public land enhance Lake Okeechobee and estuary health by reducing discharge volumes
423 and nutrient loading to downstream receiving waters through modifications to existing water management
424 structures and implementing operational strategies. In many cases, storage, retention, and detention are
425 obtained by increasing the discharge control elevation of on-site drainage facilities or impounding water in
426 shallow retention and detention areas. These projects are typically conducted on non-District public lands
427 where the District provides cost-share funding to other public entities to implement a water management
428 improvement project or on District lands where the District identifies lands that may be available for interim
429 water storage projects while a regional project is being planned, designed, or authorized for construction.
430 Previous analysis of District lands have identified available parcels for interim projects that are currently
431 being used for storage or are in the planning or design phases. The District is conducting an updated review
432 of available District lands for additional interim project sites beginning with the C-23 and C-24 drainage
433 basins. This review is anticipated to be completed in Fiscal Year 2016–2017.

434 ***Storage and Retention Projects on Private Lands***

435 Similar to public lands, projects on private lands also enhance Lake Okeechobee and estuary health by
436 reducing discharge volumes and nutrient loading to downstream receiving waters through modifications to
437 existing water management structures and implementing operational strategies. In many cases, storage,
438 retention, and detention are obtained through execution of cooperative cost-share agreements that maximize
439 the benefits the project can provide. These projects typically have exceptional circumstances such as
440 offering large, cost-effective benefits to the regional system, aiding local or regional water resource-related
441 issues, or benefiting multiple watersheds.

442 ***Northern Everglades Payment for Environmental Services***

443 As the basis for the Northern Everglades Payment for Environmental Services (NE-PES) Program, the
444 FRESP Project was a five-year pilot project to field-test and develop a payment for environmental services
445 program. FRESP partners included eight ranchers, the World Wildlife Fund, the Florida Cattlemen's
446 Association, FDACS, FDEP, the University of Florida Institute of Food and Agricultural Sciences, USDA-
447 NRCS, the MacArthur Agro-ecology Research Center, and SFWMD. Further details of the FRESP Program
448 are provided in Section 5 of the 2011 LOWPP Update (SFWMD et al. 2011).

449 An example of a very successful FRESP project that has continued operation through an extended
450 agreement is the West Waterhole Pasture Project. It is a 2,370-ac (959-ha) marsh located in Glades County
451 that drains into the C-40 (Indian Prairie) Basin. The project's goal is to remove nutrients from on-site water
452 (citrus grove) and regional water from the C-40 canal by pumping canal water into the marsh before these
453 waters discharges back to the C-40 canal. In Calendar Year 2015, a total of 4.4 billion gallons of water was
454 pumped into the marsh. Twenty-seven percent of the total inflow volume was retained in the marsh.
455 Monitoring data indicates that 4.3 mt of TP (66.3 percent of the total inflow) was retained in the marsh.
456 Also, 40.9 mt of TN (24.1 percent of the total inflow) was retained in the marsh in Calendar Year 2015.

457 The coordinating agencies have expanded opportunities for DWM in the Northern Everglades
458 watersheds whereby private landowners manage water on parts of their property to provide two different
459 water management services: water retention and storage or nutrient (TP or TN) load reduction through the
460 District's NE-PES Program. Solicitations were released through this program that allowed for an innovative
461 approach by offering eligible cattle ranchers the opportunity to compete for contracts for water and nutrient
462 retention. The goal of the NE-PES Program is to establish relationships via contracts with private
463 landowners to obtain the water management services of water retention and nutrient retention to reduce
464 flows and nutrient loads to Lake Okeechobee and the estuaries from the watersheds. The NE-PES is a
465 working program that keeps ranchers working and reduces pressure to convert ranchlands to development

466 or other more intense agricultural uses. The District is responsible for administering this program in
467 coordination with FDACS, FDEP, and USDA-NRCS.

468 The first NE-PES solicitation was released in January 2011 offering eligible cattle ranchers the
469 opportunity to compete for contracts for water and nutrient retention. Eight water retention contracts were
470 awarded as a result of that solicitation. All eight projects are operational; the total estimated retention is
471 4,778 ac-ft (5.9 million m³). The second NE-PES solicitation was released in December 2012. Nineteen
472 submittals were received and, as a result, eight contracts were awarded and are in various stages of
473 implementation. NE-PES projects will be operated as long as funding is available for up to 10 years, as
474 stated in the contracts.

475 ***Water Farming Payment for Environmental Services Pilot Program***

476 An innovative approach to delivering environmental services, similar to NE-PES, is the Water Farming
477 Payment for Environmental Services (WF-PES) pilot program. This concept seeks to field test the potential
478 for retaining water on fallow citrus lands. Two feasibility analyses were completed: one in April 2012 by
479 the Indian River Citrus League, and one in October 2013 by the Gulf Citrus Growers Association, both
480 under cooperative agreements with the District. The DWM Program WF-PES pilot projects will help
481 determine the cost-effectiveness and benefits associated with retaining water on fallow citrus lands. A WF-
482 PES pilot project request for proposal solicitation for the St. Lucie Estuary watershed area (Martin and
483 St. Lucie counties) closed on June 5, 2013, with five submitted proposals resulting in three executed
484 contracts. This program is partially funded through a Clean Water Act Section 319(h) grant agreement with
485 FDEP. Their estimated combined total storage is 11,285 ac-ft/yr (13.9 million m³/yr). The projects have
486 been constructed and are all in the operational/data collection phase. Upon completion of the pilot program,
487 data collected and lessons learned will help guide the development of any future WF-PES projects.

488 ***Northern Everglades Public-Private Partnerships***

489 In January 2016, FDEP issued a survey for water quality improvement projects that will have a regional
490 impact and will address nutrient loads toward meeting the goals of TMDLs and BMAPs. This solicitation
491 resulted in six regional-scale, public-private partnership projects selected for consideration to be enrolled
492 into the newly established NE PPP DWM program element.

493 ***Watershed-Specific Construction Projects Update***

494 This update on NEEPP construction projects focuses on the coordinating agencies' regional and
495 subregional projects that are critical to achieving the water quality, water storage, and restoration goals of
496 the LOWPP, SLRWPP, and CRWPP. During WY2016, the District continued implementing various
497 projects to improve conditions in the LOW, which included initiating construction of the southern STA for
498 the Lakeside Ranch STA – Phase II and the Rolling Meadows Wetland Restoration – Phase I projects, and
499 continuing construction activities for the KRRP (Reach 3 backfilling; see Chapter 9 of this volume).
500 Operations also continued for the Lakeside Ranch STA (Phase I), Taylor Creek STA, and Nubbin Slough
501 STA projects.

502 In the St. Lucie and Caloosahatchee River watersheds, the District also continued executing several
503 projects to improve estuary conditions including (1) starting construction of the CERP Caloosahatchee
504 River (C-43) West Basin Storage Reservoir Project, (2) continuing construction of the CERP Indian River
505 Lagoon South – C-44 Reservoir/STA Project in partnership with USACE, (3) completing construction of
506 Phase I mesocosms of the C-43 Water Quality Treatment and Testing Facility, (4) completing design of the
507 Lake Hicpochee Hydrologic Enhancement – North Project, and (5) completing design of a remediation
508 project for water storage at Ten Mile Creek. Additionally, FDACS' implementation of HWTT and
509 FAVT technologies to remove nutrients at subbasin and farm scales progressed. **Tables 8A-2 and 8A-3**
510 summarize the coordinating agencies' regional and subregional projects that are currently under way in the
511 Northern Everglades.

512

Table 8A-2. Summary of Lake Okeechobee Watershed construction projects.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Lakeside Ranch Stormwater Treatment Area (SFWMD)	Taylor Creek/ Nubbin Slough	This project, expedited under NEEPP, is located on 2,700 ac (1,090 ha) lands in western Martin County adjacent to Lake Okeechobee. The project is designed in two phases: (1) Phase I northern STA and inflow pump station; and (2) Phase II southern STA, including a second pump station to manage Rim Canal levels in Lake Okeechobee during high water flow periods and potentially to recirculate the water in Lake Okeechobee back to the STA for additional phosphorus removal.	The northern STA has an effective treatment area of 919 ac (372 ha) and the pump's capacity is at 250 cubic feet per second (cfs; 7 cubic meters per second [m ³ /sec]). The southern STA has an effective treatment area of 788 ac (319 ha).	The design document estimated an average annual load reduction of 19 mt/yr, with 9 mt/yr from Phase I and 10 mt/yr from Phase II. The overall TP removal efficiency was designed at 43%.	1) Under Phase I, the northern STA and S-650 pump station began operating in 2012. 2) Under Phase II, construction of the southern STA began in January 2016, and is expected to be completed in early 2018. Construction of the S-191A pump station is contingent on funding.	During WY2016, the northern STA captured 36,000 ac-ft (44.4 million m ³) of stormwater runoff from the S-191 basin and removed 13.0 mt of TP out of 22.8 mt received (57% TP load reduction). It also removed 17.3 mt of TN out of 78.4 mt received (22% TN load reduction). Overall, a total of 31 mt of TP has been removed from July 2013 through April 2016, well exceeding the designed rate of 9 mt per year for Phase I. The STA also has removed 63.6 mt of TN during the same period.
Taylor Creek Stormwater Treatment Area (SFWMD)	Taylor Creek/ Nubbin Slough	This project is located on the District-owned Grassy Island Ranch along the banks of Taylor Creek. This project is part of the Lake Okeechobee Critical Restoration Project, which was authorized through the federal Water Resources Development Act of 1996. USACE was responsible for the design and construction of the STA and SFWMD is responsible for operations and maintenance.	The site is 142 ac (57 ha) with an effective treatment area of 118 ac (48 ha). This two-celled STA in series is expected to treat about 10% of the water flow in Taylor Creek.	The design document (Stanley Consultants, Inc. 2003) estimated an average annual load reduction of 2.1 mt of TP. The overall TP removal efficiency was designed for 38%.	Started in 2006 and completed in 2008.	During WY2016, the STA retained 1.87 mt of TP out of 3.32 mt received (over 56% TP load reduction). As of April 30, 2016, the STA has had 68 months of flow-through operation. During this period, the STA treated 53,632 ac-ft (66.2 million m ³) of runoff water and removed 7.7 mt of TP, resulting in an annual TP load reduction of approximately 1.36 mt. The STA removed 7.8 mt of TN out of 14.9 mt received in WY2016 (52% TN load reduction). As of April 30, 2016, the average annual load reduction of TN was approximately 5.0 mt.

513

Table 8A-2. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Nubbin Slough Stormwater Treatment Area (SFWMD)	Taylor Creek/ Nubbin Slough	This STA is located on District-owned lands at the New Palm Dairy site along the banks of Nubbin Slough. This project is part of the Lake Okeechobee Critical Restoration Project, which was authorized through the federal Water Resources Development Act of 1996. USACE was responsible for the design and construction of the STA and the SFWMD is responsible for operations and maintenance.	This two-celled STA is 809 ac (327 ha) with an effective treatment area of 773 ac (313 ha).	The projected long-term average TP reduction within the STA is approximately 5 mt/yr (Stanley Consultants, Inc. 2003).	Started in 2005 and completed in 2006.	In March 2015, the Nubbin Slough STA Project was transferred to the District by USACE. After approximately 9 months of consistent sampling, the start-up monitoring requirement for TP reduction was achieved in June 2016. Flow-through activities are anticipated to begin in early WY2017.
Dispersed Water Management Program (SFWMD)	Northern Everglades	The goals and objectives of the DWM Program are to provide shallow water storage to enhance Lake Okeechobee and estuary health by reducing runoff and discharge volumes, reducing nutrient loading to downstream receiving waters, and expanding groundwater recharge opportunities. The four main categories of projects under the DWM Program include storage and retention projects on private lands, storage and retention projects on public lands, NE-PES projects on ranch lands, and Water Farming Payment for Environmental Services (WF-PES) pilot projects on fallow citrus lands. (See Table 8A-3 for DWM overview in the SLE and CRE watersheds.)	The individual project storage benefits for operational projects range from 47 ac-ft/yr (57,965 m ³ /yr) for Francis Creek to 33,860 ac-ft/yr (41.75 million m ³ /yr) for Nicodemus Slough within the Lake Okeechobee Watershed.	The storage, retention, and detention created by the 40 completed and operational projects (21 in Lake Okeechobee, 13 in St. Lucie River, and 6 in Caloosahatchee River watersheds) within the DWM Program through WY2016 is approximately 91,662 ac-ft/yr (113 million m ³ /yr). This includes contributions from other agencies and landowners.	The program started in 2005 and is ongoing.	During WY2016, there were 40 DWM projects in operation and maintenance (91,662 ac-ft/yr, or 113 million m ³ /yr), 10 projects in planning (181,610 ac-ft/yr, or 224 million m ³ /yr), 7 in design/permitting (98,645 ac-ft/yr, or 122 million m ³ /yr), and 3 in construction (4,888 ac-ft/yr, or 6.0 million m ³ /yr) in the Northern Everglades.

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Table 8A-2. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Kissimmee River Restoration Project (SFWMD)	Upper and Lower Kissimmee	<p>The main goal of KRRP is to restore ecological integrity to approximately one-third of the river and its floodplain that existed before the river was channelized in the 1960s. The project involves acquiring more than 102,000 ac (41,280 ha) of land in the river's floodplain and headwaters, backfilling 22 miles (35 kilometers [km]) of the C-38 canal, reconnecting remnant sections of the original river channel, removing two water control structures, modifying portions of the river's headwaters, and implementation of the Headwaters Regulation Schedule to meet the project hydrologic criteria needed to meet KRRP ecological goals.</p> <p>(More details on KRRP are presented in Chapter 9 of this volume.)</p>	The first three construction phases reestablished flow to 24 miles (39 km) of river channel and allowed intermittent inundation of 15,041 ac (6,087 ha) of floodplain.	TP load reduction estimates range from 17.75 mt/yr (FDEP 2014) to 20.6 mt/yr (SFWMD et al. 2008).	<p>1) The first three construction phases of restoration were completed between 2001 and 2009. The last major phases of construction are under way and are currently scheduled for completion in 2020.</p> <p>2) The Kissimmee River Headwaters Revitalization Project is designed to increase storage in the headwater lakes to provide appropriate flow patterns to the restored Kissimmee River floodplain upon completion of restoration construction and land acquisition (expected date 2020), and the increased storage is also expected to improve the quantity and quality of littoral habitat in the headwater lakes.</p>	<p>1) The last major phase of the KRRP is under way. Reach 3 backfilling was awarded in Fiscal Year 2015–2016 and is currently in progress; the final phase of KRRP construction, Reach 2 backfilling, will be awarded in Fiscal Year 2016–2017 and is planned for completion in 2020.</p> <p>2) During 2015, real estate acquisition for the Kissimmee River Headwaters Revitalization Project also progressed.</p>

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Table 8A-2. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Rolling Meadows Wetland Restoration (SFWMD)	Upper Kissimmee	The purpose of this project is to restore the historical Lake Hatchineha floodplain wetlands and habitat in the Rolling Meadows property, which was purchased jointly by SFWMD and FDEP as part of the Kissimmee Headwaters Revitalization Project (see KRRP above). The project will also provide ancillary water quality, timing, and distribution benefits.	1) Under Phase I, project structures will facilitate the hydration and restoration of approximately 1,900 ac (769 ha) of previously impacted floodplain on Lake Hatchineha. Planned storage is approximately 3,100 ac-ft/yr (3.82 million m ³ /yr). 2) Phase II of this project involves the further restoration of approximately 580 ac (235 ha). Proposed storage is projected as approximately 83 ac-ft/yr (102,379 m ³ /yr).	Phase I: estimated 0.07 mt/yr TP reduction. Phase II: estimated 0.009 mt/yr TP reduction.	1) Under Phase I, design and permitting was finalized in 2015. Construction began in November 2015, with expected completion by December 2016. 2) Under Phase II, land has been acquired and planning has begun. Once funded, project work is estimated to be completed in two to three years.	1) In 2015, Phase I design and permitting was finalized, and construction began in November 2015. Project construction includes the installation of water control structures throughout the Rolling Meadows property. 2) Under Phase II, land has been acquired and planning has started; further work is contingent on future funding.

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Table 8A-2. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Hybrid Wetland Treatment Technology (FDACS)	Taylor Creek and Nubbin Slough Subwatershed and St. Lucie River Watershed	The HWTT technology combines attributes of treatment wetlands and chemical treatment systems. There are currently eight operational HWTT systems; five in the Lake Okeechobee Watershed (Lemkin Creek, Wolff Ditch, Grassy Island, Nubbin Slough, and Mosquito Creek) and three in the St. Lucie River Watershed (Ideal 2 Grove, Bessey Creek, and Danforth Creek; see Table 8A-3).	Lemkin Creek 5 cfs (0.14 m ³ /sec), Wolff Ditch 20 cfs (0.57 m ³ /sec), Grassy Island 30 cfs (0.85 m ³ /sec), Nubbin Slough 7.4 cfs (0.21 m ³ /sec), and Mosquito Creek 6 cfs (0.17 m ³ /sec).	Based on three-year averages: Lemkin Creek (0.017 mt/yr), Wolff Ditch (0.022 mt/yr), Grassy Island in the Taylor Creek Basin (3.32 mt/yr), Nubbin Slough (0.073 mt/yr), and Mosquito Creek (0.071 mt/yr). FWM TP concentration reductions of the eight active HWTT facilities during the entire study period in the Northern Everglades ranged from 75 to 93%. TN and mass reductions average approximately 50%. Fecal coliforms were reduced approximately 85 to 90%.	In the Lake Okeechobee Watershed, Nubbin Slough and Mosquito Creek were constructed in WY2008. Lemkin Creek and Wolff Ditch were deployed in WY2011. Grassy Island was constructed in WY2012, with final expansion in WY2014.	During WY2016, operations of the five HWTT systems in the Lake Okeechobee Watershed continued.

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Table 8-2A. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Estimated Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Floating Aquatic Vegetative Tilling (FDACS)	Fisheating Creek and West Lake Okeechobee	FAVT systems are operated with an initial growing season during which the floating aquatic vegetation (FAV) assimilate nutrients and grow to a high density. The FAVT is then drained during the dry season, thereby stranding the FAV on the soil. After a natural drying process, the plant material is tilled into the soil, stored in deeper zones, and used to repopulate the wetland for the subsequent growth period. The technology uses the direct assimilation of nutrients from the water column through the use of floating plant roots (as compared to plants rooted in the soil), and all of the biomass is rapidly incorporated directly into the soil through tilling. The FAVT process may result in a reduction of up to 80% of land needed for treatment as compared to traditional wetland treatment systems.	<p>The East Caloosahatchee FAVT site is 540 ac (219 ha) and has a capacity of 90 cfs (2.55 m³/sec). It is designed to treat local agricultural runoff from the Hendry Hilliard Water Control District, the East Caloosahatchee River, and Lake Okeechobee.</p> <p>The Fisheating Creek facility is comprised of 100 ac (40 ha) of FAV and 200 ac (81 ha) of managed dispersed flow area and will have a treatment capacity of 120 cfs (3.4 m³/sec).</p>	The East Caloosahatchee FAVT facility removed approximately 2.5 mt/yr of TP (Note: facility is still in a startup/stabilization phase), and removes approximately 90% of the inflow TP load on an annual basis. The Fisheating Creek FAVT facility (to be determined).	The East Caloosahatchee facility was completed in June 2014. The Fisheating Creek facility has an expected completion date in 2016.	The East Caloosahatchee FAVT project is operational. Legislative funding has been appropriated for an FAVT site to treat water from the Fisheating Creek Subwatershed.

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Table 8A-3. Summary of Caloosahatchee River and St. Lucie River watershed construction projects.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
CERP Caloosahatchee River (C-43) West Basin Storage Reservoir Project (SFWMD)	West Caloosahatchee	The purpose of this project is to aid in capturing regulatory releases from Lake Okeechobee and to collect and store runoff from the basin that is currently discharged to the river. Water will be released when needed during the dry season to help provide essential flows that will result in a more stable salinity regime.	10,700-ac (4,330-ha) reservoir	Up to 170,000 ac-ft (21 million m ³) of storage per year	1) The site was used for short-term water storage during the extremely high rainfall events of 2013 and 2014. 2) In 2015, Construction Package #1 for Phase 1, which includes preloading and demolition work, was issued. Planned completion is July 2017. 3) In 2016, Construction Package #2 for S-476 pump station was issued. Planned completion is January 2018. 4) Under Construction Package #3, planned construction completion for S-470 pump station is April 2020. 5) Under Construction Package #4, planned completion for Cell 1 (western cell) is early 2021 and Cell 2 (eastern cell) is late 2024.	1) In November 2015, Construction Package #1 notice to proceed was issued. The package includes the preloading of structure sites and demolition of existing structures that are not needed for delivery of water to adjacent landowners. 2) In 2015, the State of Florida appropriated an additional \$9.8 million to expedite design and construct the Caloosahatchee River (C-43) West Basin Storage Reservoir Project. 3) In June 2016, Construction Package #2 for the S-476 (195 cfs or 5.5 m ³ /sec) pump station was issued.

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Table 8A-3. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
C-43 Water Quality Treatment and Testing Facility Project (SFWMD)	East Caloosahatchee	<p>The District, in partnership with Lee County, is implementing this project to demonstrate and implement cost-effective, wetland-based strategies for reducing pollutant loadings, particularly nitrogen, to the Caloosahatchee River and its downstream estuarine ecosystems. The overall project goals are to design, build, and operate a test facility that (1) will effectively remove and/or reduce the TN load to the Caloosahatchee River and Estuary, (2) is based on a review of available information and sound science, and (3) is implementable and cost-effective on larger scales and/or applicable to other South Florida estuarine systems.</p> <p>This project is being implemented in phases. Phase I includes bioassays and mesocosms. Bioassays will be used to determine the fraction of biologically available dissolved organic nitrogen in the Caloosahatchee River, which will inform the mesocosm design. Mesocosms will be used to assess potential nitrogen removal rates from surface waters using different plant communities and hydrologic loading rates.</p>	To be determined.	To be determined.	<p>1) The initial phase of testing (bioassays) began in fall 2014 and was completed in January 2016.</p> <p>2) Phase I mesocosm planning, design, and permitting were completed in 2015. Mesocosm construction was initiated in March 2016 and completed in June 2016.</p>	<p>1) During WY2016, the District complete a one-year bioassay study with the overall objective of evaluating the bioavailability of dissolved organic nitrogen in the Caloosahatchee River. This effort involved the collection of water samples along the Caloosahatchee River from Lake Okeechobee through the estuary and conducting analyses under varying seasons and conditions.</p> <p>2) Phase I mesocosm construction was completed in June 2016, followed by mesocosm installation of submergent and emergent plants and on-site soils in preparation for the experimental study.</p> <p>3) Phase I mesocosm operations, maintenance, and monitoring is planned for the next 2.5 years (through 2019).</p>

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Table 8A-3. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Lake Hicpochee Hydrologic Enhancement Project – North (SFWMD)	East Caloosahatchee	The objective of the Lake Hicpochee Hydrologic Enhancement Project is to provide shallow water storage, rehydrate a portion of the lake bed to promote habitat restoration storage, and increase capacity for ancillary water quality enhancements. It includes a shallow storage feature and a spreader canal to deliver excess stormwater runoff from the C-19 canal to the northern portion of Lake Hicpochee as needed.	670-ac (271 ha) impoundment	1,280 ac-ft (1.6 million m ³ /yr) impoundment area	Construction is anticipated to begin in mid-Fiscal Year 2017–2018.	<p>1) Preliminary surveying, technical investigations, and final engineering design are complete. Permitting is anticipated to be completed in early Fiscal Year 2017–2018.</p> <p>2) In addition to 5,300 ac (2,145 ha) of land already in state ownership, in 2014, the District acquired approximately 715 ac (289 ha) of strategic land north of Lake Hicpochee to be used as part of the shallow storage feature.</p>
CERP Indian River Lagoon South – C-44 Reservoir/STA (SFWMD)	C-44/S-153	The objectives of the C-44 Reservoir and STA are to capture, store, and treat runoff from the C-44/S-153 basin prior to discharge to the SLE. A future project component includes the ability to remove nutrients in water diverted from the C-23 Subwatershed. Implementation of this project is expected to reduce damaging freshwater discharges, decrease nutrient load, and help maintain desirable salinity regimes.	The project components currently under construction include a 3,400-ac (1,376-ha) reservoir, an 1,100 cfs (31.1 m ³ /s) pump station that will inflow water from the C-44 canal to the reservoir via the project intake canal, and an adjacent STA of approximately 7,300 ac (2,954 ha) with an effective treatment area of 6,300 ac (2,550 ha).	<p>1) In total, the project is expected to provide 60,500 ac-ft (74.6 million m³/yr) of new water storage; 50,600 ac-ft (62.4 million m³/yr) in the reservoir and 9,900 ac-ft (1.2 million m³/yr) in the STAs.</p> <p>2) Load reduction benefits from the project are estimated at 34 mt/yr for TP and 85 mt/yr for TN (USACE and SFWMD 2004).</p>	<p>Project construction started in October 2011.</p> <p>The planned completion dates are 2017 for the STA, 2018 for the reservoir pump station, and 2020 for the reservoir.</p>	<p>1) SFWMD and USACE continued construction activities as outlined in the amended Project Partnership Agreement that was executed in August 2014. The agreement splits the construction responsibilities of the project between the agencies, where SFWMD will construct the STA and pump station, and USACE will construct the reservoir.</p> <p>2) USACE continued construction on the reservoir.</p> <p>3) SFWMD continued construction of the STA, completing the cell 1 western berm, initiating work on the distribution and collection canals, and completing several of the inflow and outflow water control structures. The District also continued construction on the reservoir pump station.</p>

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Table 8A-3. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Ten Mile Creek Project (SFMWD)	North Fork	<p>The original purpose of the Ten Mile Creek Water Preserve Area was to capture and store stormwater flows that originated in the Ten Mile Creek Basin prior to discharge into the North Fork of the St. Lucie River.</p> <p>In addition, captured stormwater was intended to pass through a polishing cell for additional water quality treatment before release. However, upon construction, the project did not perform as designed.</p>	A 550-ac (223 ha) reservoir; storage capacity will be 2,500 ac-ft (3.1 million m ³) once the remediation project is completed and water can be stored at 4 feet (1.2 meters) of depth.	Following completion of remediation project, planned storage capacity up to 2,500 ac-ft (3.1 million m ³).	For the remediation project, construction contract was awarded in July 2016, with completion planned prior to the 2017 wet season.	<p>1) In August 2014, SFWMD requested that USACE deauthorize the project, terminate the project cooperation agreements, and extinguish any real estate certifications associated with the project and, following these steps, SFWMD would take full ownership and responsibility for converting the Ten Mile Creek Project into a functional facility designed to provide necessary storage and water treatment options. A transfer agreement completing the deauthorization process was approved in May 2016.</p> <p>2) In the interim (2014-2016), SFWMD obtained the proper authorizations to utilize the facility for low level storage during the 2015 wet season. Pumping into the facility began in July 2015.</p> <p>3) This past year, design of a remediation project to allow up to 4 feet (1.2 meters) of reservoir filling was completed. A construction contract for the remediation project was awarded in July 2016.</p>

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Table 8A-3. Continued.

Project Name (Investigator)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Dispersed Water Management Program (SFWMD)	Northern Everglades	<p>The goals and objectives of the DWM Program are to provide shallow water storage to enhance Lake Okeechobee and estuary health by reducing runoff and discharge volumes, reducing nutrient loading to downstream receiving waters, and expanding groundwater recharge opportunities. The four main categories of projects under the DWM Program include storage and retention projects on private lands, storage and retention projects on public lands, NE-PES projects on ranchlands, and WF-PES pilot projects on fallow citrus lands.</p> <p>(See Table 8A-2 for DWM overview in the LOW.)</p>	The individual project storage benefits for operational projects range from 24 ac-ft/yr (29,604 m ³ /yr) to 6,780 ac-ft/yr (8.4 million m ³ /yr) within the SLE and CRE watersheds.	The storage, retention, and detention created by the 40 completed and operational projects (21 in Lake Okeechobee, 13 in St. Lucie River, and 6 in Caloosahatchee River watersheds) within the DWM Program through WY2016 is approximately 91,662 ac-ft/yr (113 million m ³ /yr). This includes contributions from other agencies and landowners.	The program started in 2005 and is ongoing.	During WY2016, there were 40 DWM projects in operation and maintenance (91,662 ac-ft/yr, or 113 million m ³ /yr), 10 projects in planning (181,610 ac-ft/yr, or 224 million m ³ /yr), 7 in design/permitting (98,645 ac-ft/yr, or 122 million m ³ /yr), and 3 in construction (4,888 ac-ft/yr, or 6.0 million m ³ /yr) in the Northern Everglades.
Hybrid Wetland Treatment Technology (FDACS)	C-25 and Basins 4-5-6 Subwatersheds	<p>HWTT technology combines attributes of treatment wetlands and chemical treatment systems. There are currently eight operational HWTT systems; five in the Lake Okeechobee Watershed (Lemkin Creek, Wolff Ditch, Grassy Island, Nubbin Slough, and Mosquito Creek (see Table 8A-2) and three in the St. Lucie River Watershed (Ideal 2 Grove, Bessey Creek, and Danforth Creek).</p>	<p>Ideal 2 Grove 1.3 cfs (0.04 m³/s), Bessey Creek 20 cfs (0.57 m³/s), and Danforth Creek 25 cfs (0.71 m³/s).</p>	<p>Based on three-year averages: Ideal 2 Grove (0.09 mt/yr), Bessey Creek (to be determined), and Danforth Creek (to be determined).</p> <p>FWM TP concentration reductions of the eight active HWTT facilities during the entire study period in the Northern Everglades ranged from 75 to 93%. FWM TN and mass reductions averaged approximately 50%. Fecal coliforms were reduced approximately 85 to 90%.</p>	<p>In the St. Lucie River Watershed, Ideal 2 Grove, was constructed in WY2008, and Bessey Creek was constructed in 2015; Danforth Creek was completed and operational in April 2016.</p>	<p>Danforth Creek was completed and became operational in April 2016. During WY2016, operations of Ideal 2 Grove and Bessey Creek in the St. Lucie River Watershed also continued.</p>

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Table 8A-3. Continued.

Project Name (Project Number)	Subwatershed	General Description	Size/Capacity	Water Quality and/or Quantity Benefits	Year Construction Started and Completed or Expected Completion Date	WY2016 Status Update
Floating Aquatic Vegetative Tilling (FDACS)	East Caloosahatchee Subwatershed	FAVT systems are operated with an initial growing season during which the floating aquatic vegetation (FAV) assimilate nutrients and grow to a high density. The FAVT is then drained during the dry season, thereby stranding the FAV on the soil. After a natural drying process, the plant material is tilled into the soil, stored in deeper zones, and used to repopulate the wetland for the subsequent growth period. The technology uses the direct assimilation of nutrients from the water column through the use of floating plant roots (as compared to plants rooted in the soil), and all of the biomass is rapidly incorporated directly into the soil through tilling. The FAVT process may result in a reduction of up to 80% of land needed for treatment as compared to traditional wetland treatment systems.	The East Caloosahatchee FAVT site is 540 ac (219 ha) and has a capacity of 90 cfs (2.55 m ³ /s). It is designed to treat local agricultural runoff from the Hendry Hilliard Water Control District, the East Caloosahatchee River, and Lake Okeechobee.	The East Caloosahatchee FAVT facility removed approximately 2.5 mt/yr of TP (Note: facility is still in a startup/stabilization phase), and removes approximately 90% of the inflow TP load on an annual basis. The Fisheating Creek FAVT facility (to be determined).	The East Caloosahatchee facility was completed in June 2014.	The East Caloosahatchee FAVT project is operational.

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534 **FDACS AGRICULTURAL NON-POINT**
535 **BEST MANAGEMENT PRACTICES UPDATE**

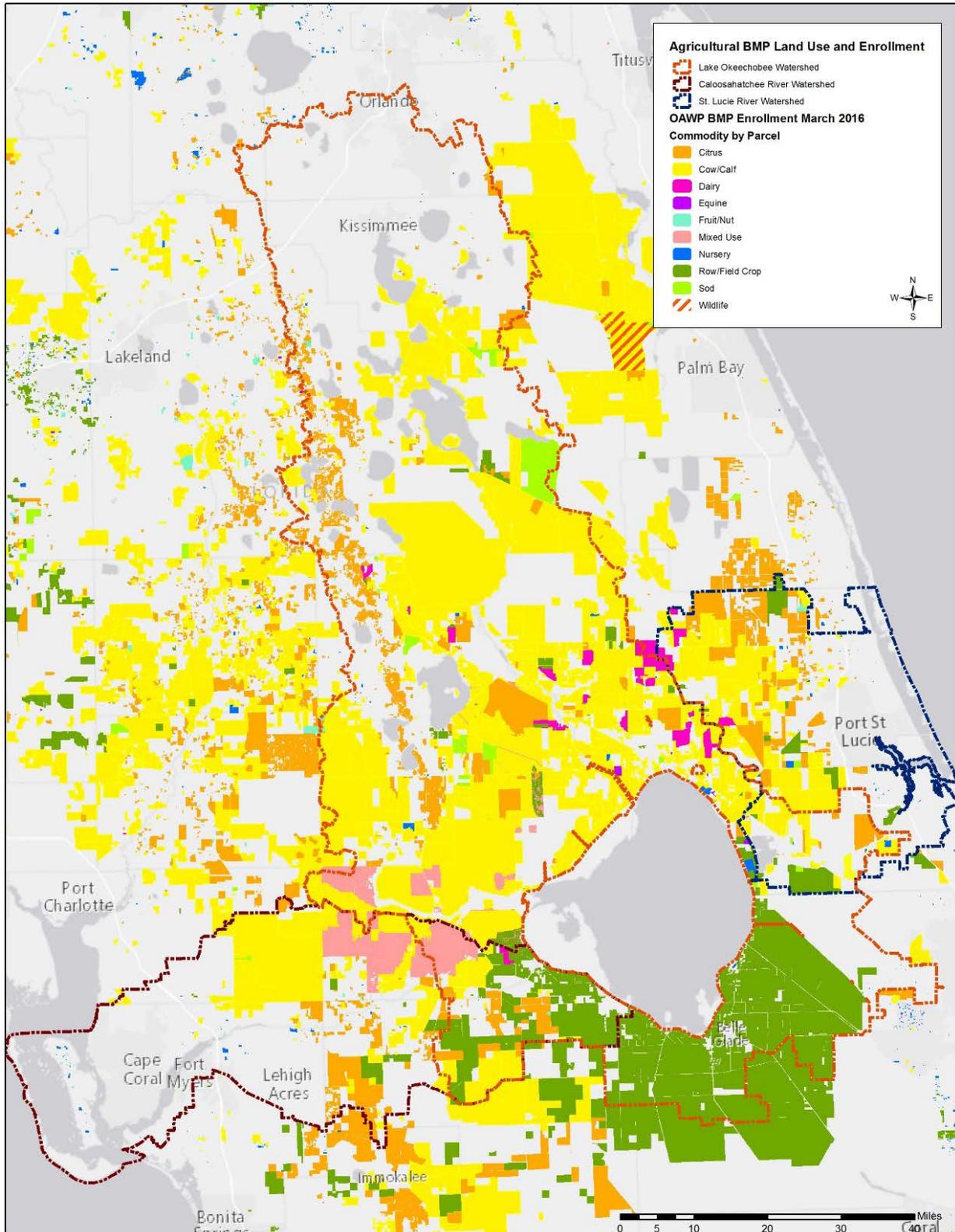
536 Florida Department of Agriculture and Consumer Services³

537 **FDACS BMP Program**

538 In 2015, the Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural
539 Water Policy (OAWP) adopted a revised vegetable and agronomic crop manual that includes specific
540 nutrient and irrigation management BMPs for plastic mulch, bare ground, sugar cane, hay/silage, and
541 greenhouse production systems (FDACS 2015b). In early 2016, FDACS adopted a dairy manual that targets
542 dairies that do not have FDEP-issued National Pollutant Discharge Elimination System (NPDES) permits
543 (FDACS 2015a). A poultry manual is also under development, and adoption is anticipated by the end of
544 2016. To date, FDACS has BMP manuals for cow/calf, citrus, vegetable and agronomic crops, nurseries,
545 equine, sod, dairy, and specialty fruit and nut operations. The FDACS BMP manuals are available on the
546 FDACS' website at [www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-](http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs/BMP-Rules-Manuals-and-Other-Documents)
547 [BMPs/BMP-Rules-Manuals-and-Other-Documents](http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs/BMP-Rules-Manuals-and-Other-Documents).

548 Once a BMP manual is adopted, FDACS works with eligible producers to be enrolled in the FDACS
549 BMP Program. During the enrollment process, FDACS field staff and/or technicians discuss the applicable
550 BMP manual with the producer and complete a notice of intent (NOI) with selected practices that are either
551 implemented or will be implemented on the property. Further information on the FDACS BMP Program
552 and enrollment in the program can be found at [www.freshfromflorida.com/Divisions-Offices/Agricultural-](http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs)
553 [Water-Policy/Enroll-in-BMPs](http://www.freshfromflorida.com/Divisions-Offices/Agricultural-Water-Policy/Enroll-in-BMPs).

554 As of March 31, 2016, FDACS has enrolled 1,793,931 ac (725,978 ha) in the LOW, 255,221 ac
555 (103,284 ha) in the St. Lucie River Watershed, and 430,379 ac (174,168 ha) in the Caloosahatchee River
556 Watershed. These boundaries, with the exception of the LOW, are different than the BMAP boundaries.
557 These enrollment acreages differ from what is reported by the BMAPs, as the Lake Okeechobee (FDEP
558 2014) and tidal Caloosahatchee Estuary (FDEP 2012) BMAPs only consider the 2000 Florida Land Cover
559 Classification System (FLUCCS) land use code as agriculture, while the St. Lucie River and Estuary BMAP
560 (FDEP 2013) also considers the 3300 FLUCCS land use code as agriculture. Also, these FDACS-reported
561 numbers include acreage that may not be considered agriculture because they are part of agricultural
562 operations, e.g., lands classified as wetlands that are part of a ranch. Furthermore, the BMAPs use 2004
563 land use data/coverage in the case of the St. Lucie River and Estuary and tidal Caloosahatchee Estuary and
564 2008 land use data/coverage in the case of the LOW. In many instances, the agricultural land use contained
565 in those data sets is outdated and not representative of present-day conditions. **Figure 8A-9** shows FDACS
566 BMP Program enrollment in the three watersheds as of March 31, 2016.



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Figure 8A-9. FDACS BMP Program enrollment as of March 31, 2016.

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570 **FDACS Implementation Assurance Program**

571 ***History of the IA Program***

572 FDACS OAWP first began formally reviewing BMP implementation in 2005 in the Suwannee River
573 Basin as part of the multiagency/local stakeholder Suwannee River Partnership. In 2007, OAWP initiated
574 an Implementation Assurance (IA) Program in the LOW. In early 2014, OAWP began to streamline the IA
575 Program to ensure consistency statewide and across commodities and BMP manuals. In late 2014, OAWP
576 commenced efforts to revise and restructure its current IA Program.

577 ***IA Program Prior to Implementation of 2016 Legislation***

578 The IA Program to date has included two key components—site visits and mail-out surveys. Site visits
579 are conducted by field staff and technicians. For the visits, field staff and technicians use a standard form
580 that was developed in 2014. This site visit form focuses on nutrient management, irrigation management,
581 and water resource protection BMPs that are common to all the adopted BMP manuals. The paper forms
582 are submitted to OAWP staff and compiled into a Microsoft Excel spreadsheet recording, for example, the
583 number of documented visits, types of BMPs implemented, and areas for improvement.

584 Mail-out surveys, the second component, were developed by OAWP in conjunction with commodity
585 experts. Enrolled producers were mailed these surveys and requested to fill out and return to OAWP staff.
586 Surveys were completed for nine different BMP manuals, including ridge citrus, Indian River citrus, Peace
587 River/Manasota citrus, Gulf citrus (FDACS 2012), vegetable and agronomic crops (FDACS 2015b),
588 container nursery (FDACS 2014), sod (FDACS 2008b), cow/calf (FDACS 2008a), and specialty fruit and
589 nut (FDACS 2011). These survey reports typically provided information on the percentage of BMP
590 implementation for irrigation-management and nutrient-management BMPs. The use of surveys has been
591 suspended pending redevelopment of the IA Program.

592 ***IA Program Enhancement Pursuant to 2016 Legislation***

593 Additional emphasis was given to implementation assurance in 2016 legislation, particularly Chapter
594 2016-1, Laws of Florida. Among its provisions, this law requires enhancement and formalization of OAWP
595 implementation assurance policies and procedures through rulemaking. Rulemaking will be initiated prior
596 to January 1, 2017. Once rulemaking is completed, FDACS will implement the enhanced IA Program and
597 more detailed reporting, as prescribed by the legislation. This enhanced reporting will include discussions
598 regarding on-site visits and surveys, which will be provided in future versions of the SFER.

599 The enhanced IA Program, as a component of the FDACS BMP Program, will be designed to:

- 600 • Provide accurate and timely information on the status of BMP enrollments;
- 601 • Provide accurate and timely information on the extent of BMP implementation;
- 602 • Provide the information from which reports on BMP enrollment and implementation can
603 be made to BMAP stakeholders and to the annual report required by Chapter 2016-1,
604 Section 34, Laws of Florida;
- 605 • Inform educational, research, and technical assistance efforts targeted to strengthen BMP
606 implementation and effectiveness; and
- 607 • Guide review and potential revision of BMP manuals.

608 According to the OAWP's database, 387 NOIs were evaluated within the Northern Everglades
609 watersheds during 2015. Of these evaluations, no "Needs Improvement" were noted for any program or
610 manual of enrollment for the following potential items: springhead/spring runs, sinks/sinkholes, wetlands,
611 wells, ditches/water control structures, access roads, livestock management, conservation/erosion potential,

612 drainage, root-zone irrigation, irrigation system maintenance, frost/freeze protection, nutrient storage
 613 facilities, nutrient budgets, and nutrient application equipment calibration/maintenance. A total of 57 NOIs
 614 received a combined total of 121 items noted as “Needs Improvement.” The most common items in need
 615 of improvement were tissue testing and nutrient application adjustments based on tissue testing. Other items
 616 noted as “Needs Improvement” were use of the mobile irrigation laboratory program for uniformity
 617 evaluations, soil testing, irrigation records, nutrient record availability, nutrient applications adjusted based
 618 on soil testing, leachate testing, and nutrients applied at agronomic rates.

619 **SAVE OUR EVERGLADES TRUST FUND EXPENDITURES**

620 While the authority to use Save Our Everglades Trust Fund (SOETF) funds is provided in Section
 621 373.470, F.S, NEEPP also provides requirements for annual reporting on NEEPP expenditures from the
 622 SOETF (Subsection 373.4595(6), F.S.). Specifically, NEEPP requires that the annual progress report
 623 contain detailed annual accounting of the expenditure of SOETF funds, including information concerning
 624 the amount and use of funds from federal, state, or local government sources, and the funds being requested
 625 to be applied to meet match requirements. **Table 8A-4** provides an accounting of NEEPP expenditures
 626 during the District’s Fiscal Year 2015–2016. This report was prepared in cooperation with the other
 627 coordinating agencies and affected local governments.

628 **CONSTRUCTION PROJECTS**

629 NEEPP construction projects and activities that comprised the Fiscal Year 2015–2016 expenditures
 630 include the following: Rolling Meadows Wetland Restoration, Lakeside Ranch STA, Lake Hicpochee
 631 Hydrologic Enhancement, C-43 Water Quality Treatment and Testing Project, DWM projects, in-lake
 632 phosphorus control projects, ecological and physical monitoring, KRRP land acquisition and other activities
 633 associated with the Lake Okeechobee regulation schedule and WPP implementation. CERP components of
 634 the NEEPP Construction Project are reported in the *Comprehensive Everglades Restoration Plan Annual*
 635 *Report – 470 Report* (Appendix 1-4 of this volume) and not included here to avoid duplicative reporting
 636 and tracking.

637 **DISTRICT AND FDACS SOURCE CONTROL PROGRAMS**

638 The Pollutant Source Control Program is a multi-faceted approach for improving the management of
 639 pollution sources within the Northern Everglades watersheds. It includes source control programs, such as
 640 BMPs, on-site treatment technologies, stormwater and wastewater infrastructure upgrades and master
 641 planning, and regulatory programs focused on water quality and quantity. Source control programs that use
 642 SOETF funds include the District’s 40E-61 Regulatory Source Control Program (per Chapter 40E-61,
 643 Florida Administrative Code) and the FDACS Agricultural BMP Program.

644 **RESEARCH AND WATER QUALITY MONITORING PROGRAM**

645 This program primarily assesses ecological health and progress toward achieving the water quality and
 646 storage targets and the plans, programs, and other responsibilities in the WPPs. The activities comprising
 647 Fiscal Year 2015–2016 expenditures include ecological and water quality monitoring, applied research,
 648 model application and development, and exotic species control.

649

650 **Table 8A-4.** Accounting of NEEPP expenditures for Fiscal Year 2015–2016.
 651 (Note: Information to be provided in the final report.)

NORTHERN EVERGLADES ANNUAL WORK PLAN – FISCAL YEAR 2016–2017

652
653

654 This Northern Everglades Annual Work Plan was prepared pursuant to the requirements of Paragraph
655 373.026(8)(b), F.S., which states that prior to the release of state funds for the implementation of the Lake
656 Okeechobee Watershed Protection Plan or River Watershed Protection Plans, SFWMD must prepare an
657 annual work plan, as part of the annual consolidated report, that is consistent with the goals and objectives
658 of Section 373.4595, F.S. Upon a determination by the FDEP secretary of the annual work plan's
659 consistency with the goals and objectives of Section 373.4595, F.S., the secretary may approve the release
660 of state funds.

661 The coordinating agencies have requested to spend SOETF dollars for implementation of the projects
662 identified in the Lake Okeechobee, Caloosahatchee River, and St. Lucie River WPPs. The projects
663 collectively identified by the coordinating agencies that will be implemented in Fiscal Year 2016–2017
664 using SOETF funding are listed below with an asterisk (*) and are an integral part of the respective WPP.
665 To provide a more comprehensive picture, projects that will be implemented in Fiscal Year 2016–2017 to
666 further the goals and objectives of NEEPP but will be funded by other sources are also included in the list.
667 A key to the lead or local sponsor of the projects is provided below the list. It should be noted that this work
668 plan is subject to change throughout the fiscal year as deemed appropriate by the coordinating agencies.

669
670 (Note: Information below to be provided in the final report.)

LAKE OKEECHOBEE WATERSHED

I. Construction Project and Other Related Activities

II. Pollutant Control Program

III. Research and Water Quality Monitoring Program

CALOOSAHATCHEE RIVER WATERSHED

I. Construction Project and Other Related Activities

II. Pollutant Control Program

III. Research and Water Quality Monitoring Program

ST. LUCIE RIVER WATERSHED

I. Construction Project

II. Pollutant Control Program

III. Research and Water Quality Monitoring Program

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