

FOURMILE COVE ECOLOGICAL PRESERVE MANAGEMENT PLAN



February 2018 – January 2028

Prepared for:



**1015 Cultural Park Blvd
Cape Coral, FL 33990**

Prepared by:



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Section A: Acquisition Information Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
1.	The common name of the property.	18-2.018 & 18-2.021	1
2.	The land acquisition program, if any, under which the property was acquired.	18-2.018 & 18-2.021	3
3.	Degree of title interest held by the Board, including reservations and encumbrances such as leases.	18-2.021	3
4.	The legal description and acreage of the property.	18-2.018 & 18-2.021	Appendix A
5.	A map showing the approximate location and boundaries of the property, and the location of any structures or improvements to the property.	18-2.018 & 18-2.021	2
6.	An assessment as to whether the property, or any portion, should be declared surplus. <i>Provide Information regarding assessment and analysis in the plan, and provide corresponding map.</i>	18-2.021	22
7.	Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property. <i>Please clearly indicate parcels on a map.</i>	18-2.021	22, 23
8.	Identification of adjacent land uses that conflict with the planned use of the property, if any.	18-2.021	20
9.	A statement of the purpose for which the lands were acquired, the projected use or uses as defined in 253.034 and the statutory authority for such use or uses.	259.032	3
10.	Proximity of property to other significant State, local or federal land or water resources.	18-2.021	5 - 8

Section B: Use Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
11.	The designated single use or multiple use management for the property, including use by other managing entities.	18-2.018 & 18-2.021	20 - 22
12.	A description of past and existing uses, including any unauthorized uses of the property.	18-2.018 & 18-2.021	20 - 22
13.	A description of alternative or multiple uses of the property considered by the lessee and a statement detailing why such uses were not adopted.	18-2.018	20 - 22
14.	A description of the management responsibilities of each entity involved in the property's management and how such responsibilities will be coordinated.	18-2.018	23
15.	Include a provision that requires that the managing agency consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archeological or historical resources.	18-2.021	30
16.	Analysis/description of other managing agencies and private land managers, if any, which could facilitate the restoration or management of the land.	18-2.021	37
17.	A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	259.032	20 - 22
18.	A finding regarding whether each planned use complies with the 1981 State Lands Management Plan, particularly whether such uses represent "balanced public utilization," specific agency statutory authority and any other legislative or executive directives that constrain the use of such property.	18-2.021	20 - 22
19.	Letter of compliance from the local government stating that the LMP is in compliance with the Local Government Comprehensive Plan.	BOT requirement	Not Yet Available
20.	An assessment of the impact of planned uses on the renewable and non-renewable resources of the property, including soil and water resources, and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to compensate/mitigate damage caused by such uses, including a description of how the manager plans to control and prevent soil erosion and soil or water contamination.	18-2.018 & 18-2.021	20 - 22

Section B: Use Items - Continued

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
21.	*For managed areas larger than 1,000 acres, an analysis of the multiple- use potential of the property which shall include the potential of the property to generate revenues to enhance the management of the property provided that no lease, easement, or license for such revenue- generating use shall be entered into if the granting of such lease, easement or license would adversely affect the tax exemption of the interest on any revenue bonds issued to fund the acquisition of the affected lands from gross income for federal income tax purposes, pursuant to Internal Revenue Service regulations.	18-2.021 & 253.036	32,33
22.	If the lead managing agency determines that timber resource management is not in conflict with the primary management objectives of the managed area, a component or section, prepared by a qualified professional forester, that assesses the feasibility of managing timber resources pursuant to section 253.036, F.S.	18-021	30
23.	A statement regarding incompatible use in reference to Ch. 253.034(10).	253.034(9)	22

Section C: Public Involvement Items

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
24.	A statement concerning the extent of public involvement and local government participation in the development of the plan, if any.	18-2.021	4
25.	The management prospectus required pursuant to paragraph (7)(c) shall be available to the public for a period of 30 days prior to the public hearing.	259.032	Appendix F
26.	LMPs and LMP updates for parcels over 160 acres shall be developed with input from an advisory group who must conduct at least one public hearing within the county in which the parcel or project is located. <i>Include the advisory group members and their affiliations, as well as the date and location of the advisory group meeting.</i>	259.032	4
27.	Summary of comments and concerns expressed by the advisory group for parcels over 160 acres	18-2.021	Appendix N
28.	During plan development, at least one public hearing shall be held in each affected county. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. <i>Include a copy of each County's advertisements and announcements (meeting minutes will suffice to indicate an announcement) in the management plan.</i>	253.034(5) & 259.032	Not Yet Available
29.	The manager shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan. <i>Include manager's replies to the team's findings and recommendations.</i>	259.036	Appendix N
30.	Summary of comments and concerns expressed by the management review team, if required by Section 259.036, F.S.	18-2.021	Appendix N
31.	If manager is not in agreement with the management review team's findings and recommendations in finalizing the required 10-year update of its management plan, the managing agency should explain why they disagree with the findings or recommendations.	259.036	Appendix N

Section D: Natural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
32.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding soil types. <i>Use brief descriptions and include USDA maps when available.</i>	18-2.021	9, 11
33.	Insert FNAI based natural community maps when available.	ARC consensus	13
34.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding outstanding native landscapes containing relatively unaltered flora, fauna and geological conditions.	18-2.021	12 - 14
35.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding unique natural features and/or resources including but not limited to virgin timber stands, scenic vistas, natural rivers and streams, coral reefs, natural springs, caverns and large sinkholes.	18-2.018 & 18-2.021	19
36.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding beaches and dunes.	18-2.021	12 - 14
37.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding mineral resources, such as oil, gas and phosphate, etc.	18-2.018 & 18-2.021	19
38.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding fish and wildlife, both game and non-game, and their habitat.	18-2.018 & 18-2.021	14 - 16
39.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding State and Federally listed endangered or threatened species and their habitat.	18-2.021	14 - 16
40.	The identification of resources on the property that are listed in the Natural Areas Inventory. <i>Include letter from FNAI or consultant where appropriate.</i>	18-2.021	Appendix H
41.	Specific description of how the managing agency plans to identify, locate, protect and preserve or otherwise use fragile, nonrenewable natural and cultural resources.	259.032	19, 25 - 30
42.	Habitat Restoration and Improvement		
42-A.	Describe management needs, problems and a desired outcome and the key management activities necessary to achieve the enhancement, protection and preservation of restored habitats and enhance the natural, historical and archeological resources and their values for which the lands were acquired.	259.032 & 253.034(5) ↓	25 - 30
42-B.	Provide a detailed description of both short (2-year planning period) and long-term (10-year planning period) management goals, and a priority schedule based on the purposes for which the lands were acquired and include a timeline for completion.		34 - 38
42-C.	The associated measurable objectives to achieve the goals.		34 - 38
42-D.	The related activities that are to be performed to meet the land management objectives and their associated measures. <i>Include fire management plans - they can be in plan body or an appendix.</i>		34 - 38
42-E.	A detailed expense and manpower budget in order to provide a management tool that facilitates development of performance measures, including recommendations for cost-effective methods of accomplishing those activities.		34 - 38
43.	***Quantitative data description of the land regarding an inventory of forest and other natural resources and associated acreage. <i>See footnote.</i>	253.034(5)	12 - 14

Section D: Natural Resources - Continued

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
44	Sustainable Forest Management, including implementation of prescribed fire management	18-2.021, 253.034(5) & 259.032)	19, 30
44-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		19, 30
44-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		19, 30
44-C.	Measurable objectives (see requirement for #42-C).		19, 30
44-D.	Related activities (see requirement for #42-D).		19, 30
44-E.	Budgets (see requirement for #42-E).		19, 30
45.	Imperiled species, habitat maintenance, enhancement, restoration or population restoration	259.032 & 253.034(5) ↓	23
45-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		26 - 29
45-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		34, 35, 37
45-C.	Measurable objectives (see requirement for #42-C).		34, 35, 37
45-D.	Related activities (see requirement for #42-D).		34, 35, 37
45-E.	Budgets (see requirement for #42-E).		34, 35, 37
46.	***Quantitative data description of the land regarding an inventory of exotic and invasive plants and associated acreage. <i>See footnote.</i>	253.034(5)	12 - 14
47.	Place the Arthropod Control Plan in an appendix. If one does not exist, provide a statement as to what arrangement exists between the local mosquito control district and the management unit.	BOT requirement via lease language	31 Appendix O
48.	Exotic and invasive species maintenance and control	259.032 & 253.034(5) ↓	
48-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		29, 30, 34 - 37
48-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		29, 30, 34 - 37
48-C.	Measurable objectives (see requirement for #42-C).		29, 30, 34 - 37
48-D.	Related activities (see requirement for #42-D).		29, 30, 34 - 37
48-E.	Budgets (see requirement for #42-E).		29, 30, 34 - 37

Section E: Water Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
49.	A statement as to whether the property is within and/or adjacent to an aquatic preserve or a designated area of critical state concern or an area under study for such designation. <i>If yes, provide a list of the appropriate managing agencies that have been notified of the proposed plan.</i>	18-2.018 & 18-2.021	5
50.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding water resources, including water classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Water under Rule 62-302.700, F.A.C.	18-2.021	18
51.	Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding swamps, marshes and other wetlands.	18-2.021	12 - 14
52.	***Quantitative description of the land regarding an inventory of hydrological features and associated acreage. <i>See footnote.</i>	253.034(5)	13
53.	Hydrological Preservation and Restoration	259.032 & 253.034(5) ↓	
53-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		25
53-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		35
53-C.	Measurable objectives (see requirement for #42-C).		35
53-D.	Related activities (see requirement for #42-D).		35
53-E.	Budgets (see requirement for #42-E).		35

Section F: Historical, Archeological and Cultural Resources

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
54	**Location and description of known and reasonably identifiable renewable and non-renewable resources of the property regarding archeological and historical resources. <i>Include maps of all cultural resources except Native American sites, unless such sites are major points of interest that are open to public visitation.</i>	18-2.018, 18-2.021 & per DHR's request	19, 30
55	***Quantitative data description of the land regarding an inventory of significant land, cultural or historical features and associated acreage.	253.034(5)	19, 30
56	A description of actions the agency plans to take to locate and identify unknown resources such as surveys of unknown archeological and historical resources.	18-2.021	19, 30
57	Cultural and Historical Resources	259.032 & 253.034(5)	
57-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).		19, 30
57-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		19, 30
57-C.	Measurable objectives (see requirement for #42-C).		19, 30
57-D.	Related activities (see requirement for #42-D).		19, 30
57-E.	Budgets (see requirement for #42-E).		19, 30

Section G: Facilities (Infrastructure, Access, Recreation)

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
58.	***Quantitative data description of the land regarding an inventory of infrastructure and associated acreage. <i>See footnote.</i>	253.034(5)	12 - 14
59.	Capital Facilities and Infrastructure		
59-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032 & 253.034(5) ↓	32
59-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		35, 36
59-C.	Measurable objectives (see requirement for #42-C).		35, 36
59-D.	Related activities (see requirement for #42-D).		35, 36
59-E.	Budgets (see requirement for #42-E).		35, 36
60	*** Quantitative data description of the land regarding an inventory of recreational facilities and associated acreage.	253.034(5)	20
61	Public Access and Recreational Opportunities		
61-A.	Management needs, problems and a desired outcome (see requirement for # 42-A).	259.032 & 253.034(5)	36 - 38
61-B.	Detailed description of both short and long-term management goals (see requirement for # 42-B).		36 - 38
61-C.	Measurable objectives (see requirement for #42-C).		36 - 38
61-D.	Related activities (see requirement for #42-D).		36 - 38
61-E.	Budgets (see requirement for #42-E).		36 - 38

Section H: Other/ Managing Agency Tools

Item #	Requirement	Statute/Rule	Page Numbers and/or Appendix
62.	Place this LMP Compliance Checklist at the front of the plan.	ARC and managing agency consensus	vi - xi
63.	Place the Executive Summary at the front of the LMP. Include a physical description of the land.	ARC and 253.034(5)	Not Yet Available
64.	If this LMP is a 10-year update, note the accomplishments since the drafting of the last LMP set forth in an organized (categories or bullets) format.	ARC consensus	Not Yet Available
65.	Key management activities necessary to achieve the desired outcomes regarding other appropriate resource management.	259.032	25 – 33,- 37
66.	Summary budget for the scheduled land management activities of the LMP including any potential fees anticipated from public or private entities for projects to offset adverse impacts to imperiled species or such habitat, which fees shall be used to restore, manage, enhance, repopulate, or acquire imperiled species habitat for lands that have or are anticipated to have imperiled species or such habitat onsite. The summary budget shall be prepared in such a manner that it facilitates computing an aggregate of land management costs for all state-managed lands using the categories described in s. 259.037(3) which are resource management, administration, support, capital improvements, recreation visitor services, law enforcement activities.	253.034(5)	32, 33
67.	Cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired, include recommendations for cost-effective methods in accomplishing those activities.	259.032	32, 33
68.	A statement of gross income generated, net income and expenses.	18-2.018	32, 33

1.0 INTRODUCTION

1.1 Background

The Four Mile Cove Ecological Preserve (FMCEP) is comprised of approximately 365 acres of land located along the northwestern shore of the Caloosahatchee River in the City of Cape Coral. FMCEP is the second largest preserved green space within Cape Coral, providing residents access to walking trails, a visitor center, the Veteran's Memorial Area, and seasonal kayak rentals to explore scenic southwest Florida coastal habitats.

FMCEP was purchased in August of 1977 from GAC Properties, Inc. by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (BOT) as a wilderness area under Chapter 258, Florida Statutes (FS) and has been maintained by Cape Coral as a natural preserve and park for 40 years.

1.2 Purpose

The FMCEP Land Management Plan (LMP) was prepared to describe the existing uses of the unique natural resources provided by FMCEP and outline future land stewardship and planning needs. The plan is submitted for review to the BOT through the Florida Department of Environmental Protection (FDEP), Division of State Lands (DSL) and is designed to comply with Chapter 18-2 Florida Administrative Code (FAC) and FS Chapters 253, 259 and 372. FMCEP has not been subject to a previous Land Management Review.

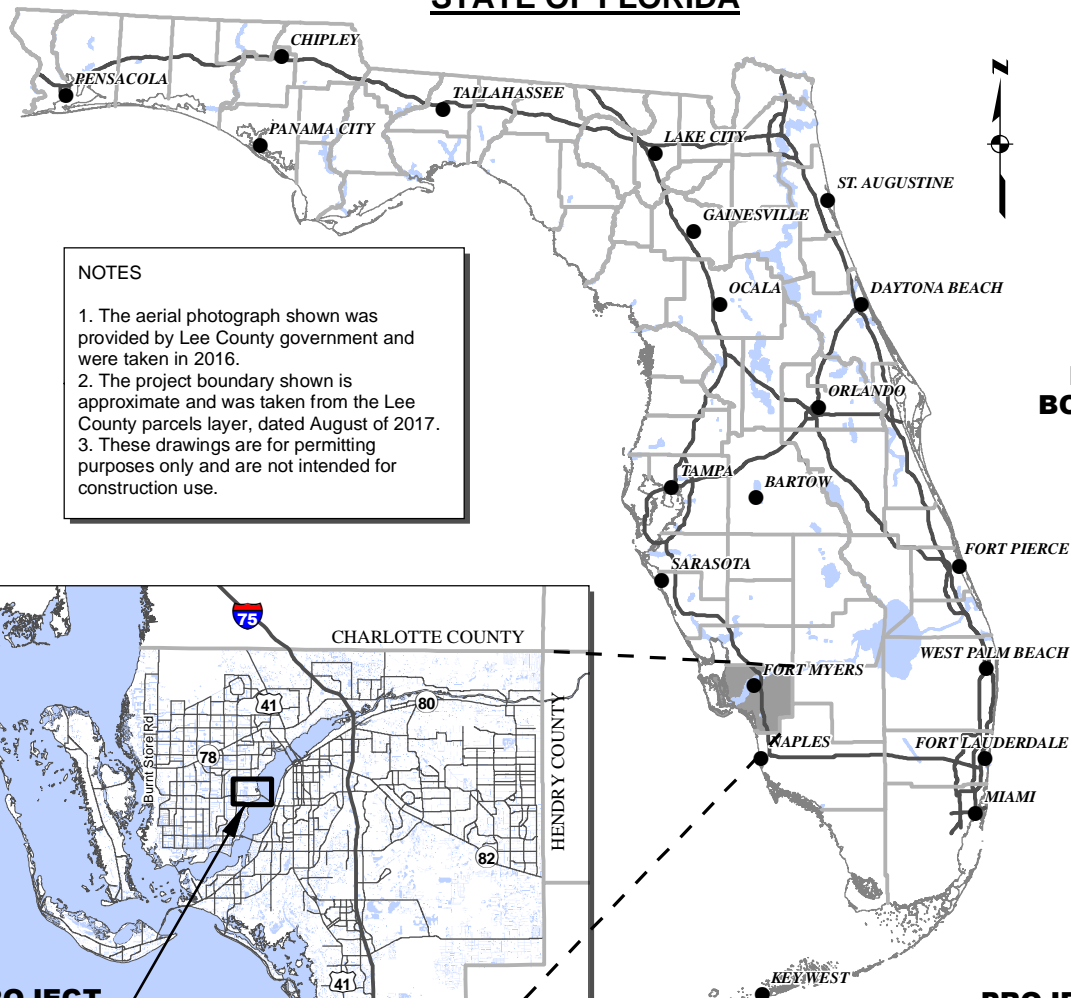
1.3 Location

FMCEP is located on the eastern boundary of the City of Cape Coral within Sections 28 and 29, Township 44 South, Range 24 East with central coordinates of latitude 26° 36' 46" North, longitude 81° 55' 14" West. The property is bound to the east by the Caloosahatchee River and Veteran's Memorial Parkway to the south, residential housing to the west and an undeveloped parcel to the north. **Figure 1-1** provides a location map of FMCEP. The legal description of the property is attached in **Appendix A**.

Driving directions to FMCEP from Interstate 75 require taking Exit 158, Tuckers Grade. Go west to US 41 and turn left. Take US 41 south to Del Prado Blvd N and turn right. Follow Del Prado south to Four Mile Cove Pkwy. Turn left onto Four Mile Cove Pkwy and right onto SE 17th Place. Follow SE 17th Place south, then turn left onto SE 23rd Terrace. Continue onto SE 24th Street to the site.

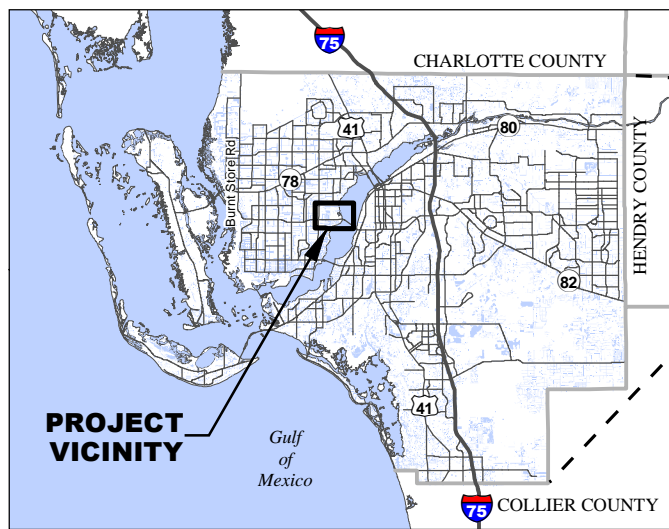
\\frms01\drawings\2016\20160308-005\Environmental\arcgis\locmap.mxd

STATE OF FLORIDA



NOTES

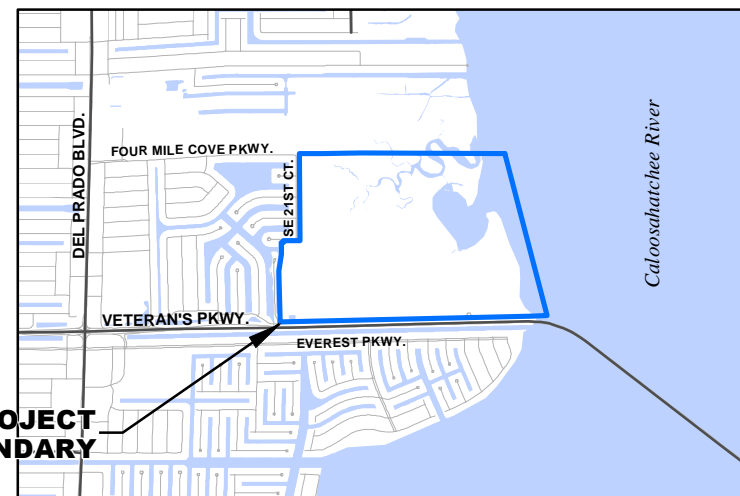
1. The aerial photograph shown was provided by Lee County government and were taken in 2016.
2. The project boundary shown is approximate and was taken from the Lee County parcels layer, dated August of 2017.
3. These drawings are for permitting purposes only and are not intended for construction use.



LEE COUNTY
N.T.S.

Sections 28 & 29, Township 44 South, Range 24 East
Latitude: 26° 36' 46" N, Longitude: 81° 55' 14" W

PROJECT BOUNDARY



STREET MAP
N.T.S.

PROJECT BOUNDARY



VICINITY AERIAL
N.T.S.

Fourmile Cove Eco Preserve
Lee County, Florida

JOHNSON
ENGINEERING

JOHNSON ENGINEERING, INC.
2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (239) 334-0046
FAX (239) 334-3661
E.B. #642 & L.B. #642

Location Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Oct. 2017	20160308-005		N/A	1

1.4 Regional Significance

FMCEP is one of the largest remaining natural wetland areas within Cape Coral and is the only natural wetland area open for public enjoyment in the eastern part of the city. FMCEP is one of the only preserves in the area where visitors can walk into a mangrove forest and experience this unique, coastal environment up close without the need of a boat. It is home to one of the few remaining needle rush marshes in southwest Florida. FMCEP is also the home of the Veteran's Memorial Park, which pays tribute to US service men and women through the years. FMCEP is located adjacent to Veteran's Memorial Parkway and the Midpoint Bridge providing convenient access for visitors and residents. Kayak rental and put-in facilities at FMCEP allow patrons to explore winding creeks and mature mangrove forests. The unique environmental and geographical characteristics of FMCEP have led to its incorporation into the Great Calusa Blueway paddling trail, which provides canoe and kayak routes through scenic areas of Bonita, Cape Coral, Estero, Fort Myers, and Pine Island.

1.5 Acquisition

FMCEP was sold via Warranty Deed with Restrictions on Use in 1977 as recorded in Lee County OR 1268 PG 1972 – 1978. A subsequent Quitclaim Deed dated December 17, 1993 as recorded in Lee County OR 2463 PG 2475 – 2477 modified certain restrictions in the original deed. FMCEP was not obtained as the result of any land acquisition program sponsored by either the state or federal government. A copy of the deed, which contains the previously mentioned restrictions and right of reverter, is attached as **Appendix B**. Also attached as **Appendix C** is an executed and recorded Quitclaim Deed which modifies certain restrictions of the original deed.

1.6 Title Interest

The BOT currently holds fee simple title to the property, subject to restrictions specified within the deed. Avatar Properties, Inc., the successor in interest to the grantor, GAC Properties, Inc. has a right of reverter in the event of a violation of any of those restrictions.

1.7 Management Authority

Management and development of FMCEP is subject to regulations set forth by the City of Cape Coral Community Development Department through the Planned Unit Development (PUD) process. In addition, any jurisdictional wetland areas of the property are subject to permitting requirements of the South Florida Water Management District (SFWMD) and / or the Florida Department of Environmental Protection (FDEP) and the U.S. Army Corps of Engineers (USACE). A copy of applicable City regulations is attached as **Appendix D**.

1.8 Public Involvement

The FMCEP has been a part of the Cape Coral community for over 40 years. In that time, several organizations have utilized the park for community-building and educational activities. FMCEP has benefited from this relationship by receiving volunteer expertise and labor. Collaborations between FMCEP and other organizations include those listed in **Table 1-1** below:

Table 1-1: Community Involvement

Organization	Activities
Cape Coral Friends of Wildlife	Organizes and conducts maintenance projects and environmental education programs.
Florida Gulf Coast University Service Learning	Organizes and conducts clean-up and maintenance activities.
Boy Scouts of America	Design and installation of educational displays, picnic benches and areas, signs, bat houses, and kayak rest areas.
Veteran's Midpoint Memorial Charitable Trust	Design and installation of pavilion and monuments, organizing and holding ceremonies and celebration events for veterans.

Updates to the FMCEP Management Plan were prepared and reviewed by an advisory group assembled from City of Cape Coral employees, Veteran's Midpoint Memorial Charitable Trust (VMMCT), Cape Coral Friends of Wildlife (CCFW), Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS) and consultants. **Table 1-2** provides a list of the participants in the FMCEP Land Management Plan (LMP) advisory group and their affiliations.

Table 1-2: FMCEP LMP Advisory Group

First Name	Last Name	Affiliation	Title	Email address
Gary	Bowler	VMMCT	President	garybjudyb@embarqmail.com
Pascha	Donaldson	CCFW	Vice President	ed.pascha@att.net
Kraig	Hankins	City	Environmental Biologist	khankins@capecoral.net
Justin	Heller	City	Planner	jheller@capecoral.net
Katie	Locklin	City	Senior Recreation Specialist	kalockli@capecoral.net
Honey	Phillips	City	Senior Recreation Specialist	hlphilli@capecoral.net
Kerry	Runyon	City	Director, Parks and Recreation	krunyon@capecoral.net
Corey	Anderson	FWC	Biological Scientist	Corey.Anderson@MyFWC.com
Michael	Weston	FDACS	Manager, Caloosahatchee Forestry Center	Michael.Weston@FreshFromFlorida.com
John	Gunter	City Council	Councilman, District 1	jgunter@capecoral.net
Werner	Grabner	Resident	Cape Coral Resident	mymudda@hotmail.com
Sharon	Thompson	Resident	Cape Coral Resident	mymudda@hotmail.com
Gary	Nychyk	Johnson Engineering	Ecologist, Consultant	agn@johnsoneng.com

Meetings to discuss stakeholder input were held on May 19, 2017, February 5, 2018, March 14, 2018, April 5, 2019 and May 19, 2019. A summary of comments received from the stakeholders meetings are provided in **Appendix E**.

Upon completion of the first draft of the LMP for FMCEP, a public hearing was scheduled for (TIME) (DATE) at (LOCATION). The management prospectus was provided to the public by ***, on (DATE). This exceeds the required 30-day notice of public hearing. A copy of the management prospectus is provided in **Appendix F**.

1.9 Nearby Public Lands

Public lands within 15 miles of FMCEP include at least 62 areas covering over 160,000 acres. Ownership of these public lands includes federal, state and local agencies along with private foundations and is comprised of properties ranging in size from under 0.5 acres to over 6,000 acres. These areas provide wildlife refuges, ecological preserves, recreational opportunities and access to beaches, rivers and streams. The FMCEP is approximately seven miles east of Matlacha Pass (Nearest Aquatic Preserve), seven miles north of the Estero Bay (closest water body classified as Outstanding Florida Waters) and approximately 35 miles northwest of the Big Cypress (Area of Critical Concern). **Table 1-3** lists known preserves by owner and acreage, while **Figure 1-2** depicts known public lands within 15 miles of FMCEP.

Table 1-3: Nearby Public Lands

Preserve Name	Owner	Approx. area in acres
Lighthouse Beach Park	BLM	32.00
Charlotte Harbor Preserve State Park	BOT	42,515.20
Estero Bay Preserve State Park	BOT	10,003.20
Four Mile Cove Ecological Preserve	BOT	365.00
Koreshan State Historic Site	BOT	135.00
Mound Key Archaeological State Park	BOT	125.00
Yucca Pens Unit	BOT	234.00
Calusa Land Trust and Nature Preserve of Pine Island	Calusa Land Trust	115.78
Cape Coral Wildlife Trust Conservation Land	CCWT	0.25
Pine Island Preserve at Matlacha Pass	CFGC	230.00
Charlotte Flatwoods Environmental Park	Charlotte County	486.00
Rotary Park Environmental Center	City of Cape Coral	97.00
Oasis Woods	City of Cape Coral	50.00
Sirenia Vista	City of Cape Coral	8.40
Calusa Nature Center and Planetarium	City of Fort Myers	105.00
Pond Apple Park	City of Sanibel	40.00
Fred C. Babcock-Cecil M. WMA	FWC	80,768.00
Caloosahatchee National Wildlife Refuge	FWS	40.00
J. N. Ding Darling National Wildlife Refuge	FWS	5,200.00
Matlacha Pass National Wildlife Refuge	FWS	538.00
Norberg Research Natural Area	FWS	150.00
Pine Island National Wildlife Refuge	FWS	601.00
Billy Creek Preserve	Lee County	50.69
Bowditch Point Park	Lee County	17.00
Buckingham Trails Preserve	Lee County	572.00
Buttonwood Preserve	Lee County	267.60
Caloosahatchee Creeks Preserve	Lee County	1,308.55
Carver Preserve	Lee County	189.00
Charlotte Harbor Buffer Preserve	Lee County	448.61
Columbus G. MacLeod Preserve	Lee County	8.70
Deep Lagoon Preserve	Lee County	271.85
Eagle Lake Preserve	Lee County	40.63
Estero Marsh Preserve	Lee County	243.97
Flag Pond Preserve	Lee County	66.90
Galt Preserve	Lee County	264.98
Harn's Marsh	Lee County	578.00
Hickory Swamp Preserve	Lee County	66.55
Koreshan Preserve	Lee County	37.83

Table 1-3: Nearby Public Lands (Continued)

Preserve Name	Owner	Approx. area in acres
Lakes Regional Park	Lee County	279.00
Lovers Key State Park	Lee County	716.80
Pine Island Flatwoods Preserve	Lee County	919.64
Pop Ash Creek Preserve	Lee County	307.45
Powell Creek Preserve	Lee County	77.20
Prairie Pines Preserve	Lee County	2,654.11
Punta Rassa Preserve	Lee County	11.04
Randell Research Center	Lee County	67.00
San Carlos Bay - Bunche Beach Preserve	Lee County	719.40
Six Mile Cypress Slough Preserve	Lee County	2,266.70
Six Mile Cypress Slough Preserve North	Lee County	1,219.02
Smokehouse Bay Preserve	Lee County	268.32
St. James Creek Preserve	Lee County	118.00
Telegraph Creek Preserve	Lee County	1,726.84
West Marsh Preserve	Lee County	205.85
Wild Turkey Strand Preserve	Lee County	3,104.87
Yellow Fever Creek Preserve	Lee County	339.43
Yucca Pens Preserve	Lee County	231.03
Kurgis Conservation Easement	Private Individual(s)	0.63
SCCF Conservation Lands	SCCF	158.03
Total		161,799.88

Notes:

BOT - Board of Trustees of the Internal Improvement Trust Fund of the State of Florida

CCWT - Cape Coral Wildlife Trust

CFGF - Conservation Foundation of the Gulf Coast

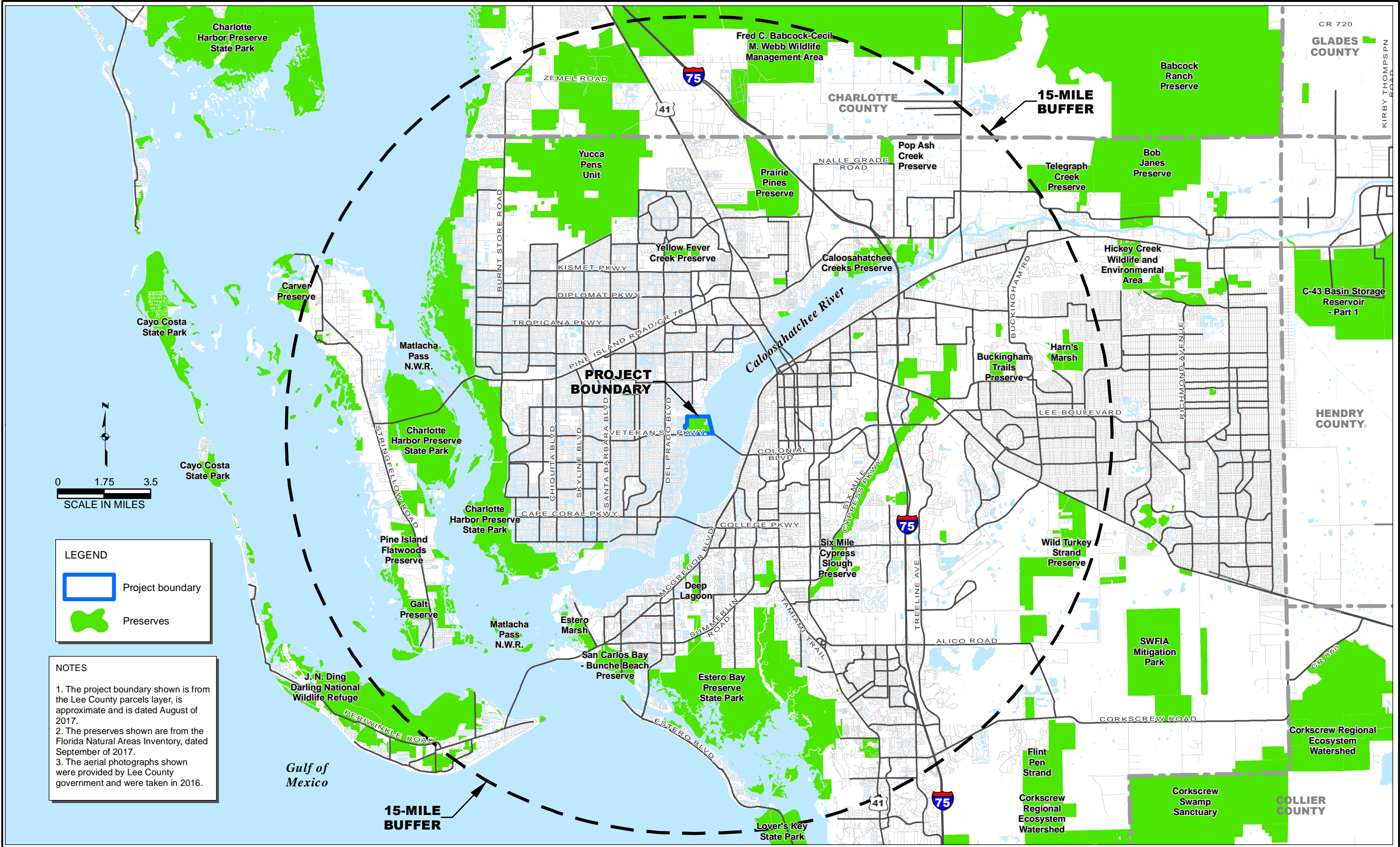
FWC - Florida Fish and Wildlife Conservation Commission

FWS - US Fish and Wildlife Service

SCCF - Sanibel Captiva Conservation Foundation

WMA - Wildlife Management Area

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Four Mile Cove Eco Preserve
Lee County, Florida

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E.B. #642 & L.B. #642

Preserves

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Oct. 2017	20160308-005	--	As Shown	1

2.0 NATURAL AND CULTURAL RESOURCES

2.1 Physiography

2.1.1 Topography and Geomorphology

FMCEP is comprised of relatively flat tidally influenced habitats ranging in elevation from sea level up to 3.9 feet (NAVD 1988) throughout most of the park area. Previous fill activities associated with the right of way along the southern property boundary along with excavation of mosquito ditches in the interior led to elevations of up to 9.4 feet. **Figure 2-1** depicts a topographic map of the project area based on 2007 LIDAR data provided by the Florida Department of Emergency Management.

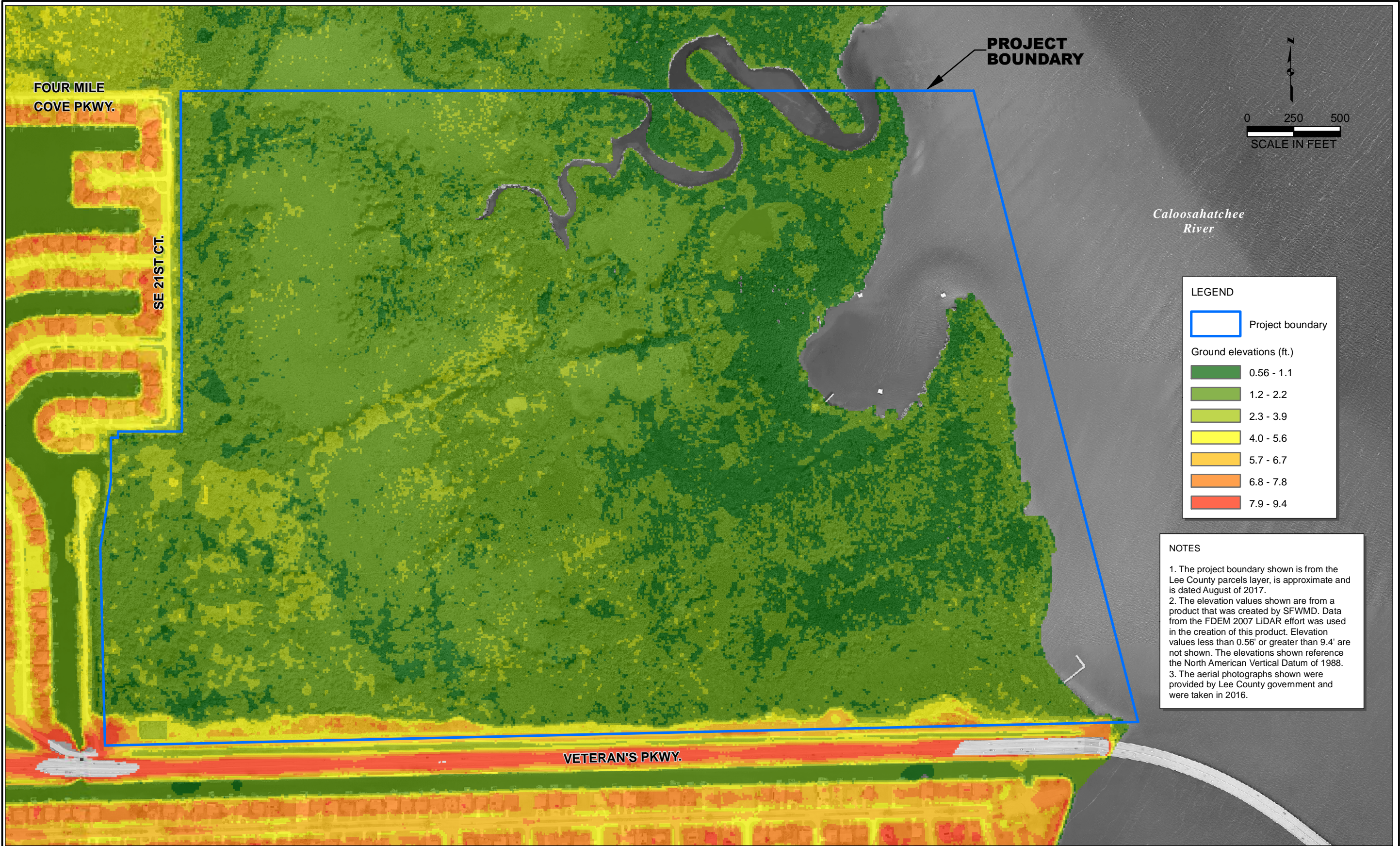
2.1.2 Soils

The Florida Geographic Data Library indicates that FMCEP is comprised of four soil types along with open water. **Table 2-1** provides a description of the soil series types found on the FMCEP property along with typical vegetation and Figure 2-2 depicts the Soils Map. A full soils report from the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) for this area is provided as **Appendix G**.

Table 2-1: Soils

Soil Type	Hydric Status	Description	Typical Vegetation
Wulfert Muck	Hydric	Nearly level, very poorly drained soil on broad tidal swamps. The water table fluctuates with the tide. These areas are subject to tidal flooding.	Red mangrove, black mangrove, needlerush, and cordgrass
Kesson Fine Sand	Hydric	Nearly level, very poorly drained soil on broad tidal swamps. The water table fluctuates with the tide. These areas are subject to tidal flooding.	Black mangrove, batis, oxeye daisy and red mangrove.
Oldsmar Sand	Non-Hydric	Nearly level, poorly drained soil on low, broad flatwood areas. Water level is at a depth of less than ten inches for 1 - 3 months out of the year during most years under natural conditions.	Slash pine, saw palmetto, pineland threeawn, and meadowbeauty.
Matlacha Gravelly Fine Sand	Non-Hydric	Nearly level, somewhat poorly drained soils formed by filling and earthmoving operations.	Most natural vegetation has been removed. Existing vegetation includes slash pine and various weeds.
Water	N/A		

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Topographic Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Oct. 2017	20160308-005	--	As Shown	1

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Four Mile Cove Eco Preserve
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Soils Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Oct. 2017	20160308-005	--	As Shown	2

2.1.3 Hydrology

The FMCEP is comprised mostly of tidally influenced wetlands such as saltwater marsh and mangrove swamps. Salinity levels of the preserve are influenced by local and regional rainfall, freshwater discharges from Lake Okeechobee and freshwater drainage from the Cape Coral canal system.

2.2 Climate

FMCEP experiences a typical coastal climate for southwest Florida. Average daily high temperatures from May through October are above 87°F, with average high temperatures of 92°F in June, July and August. Average daily low temperatures from December to March are below 60°F with the coldest months being January and February. Average rainfall is approximately 56.02 inches per year with over 37 inches (67%) falling between June and September (TWC, 2017).

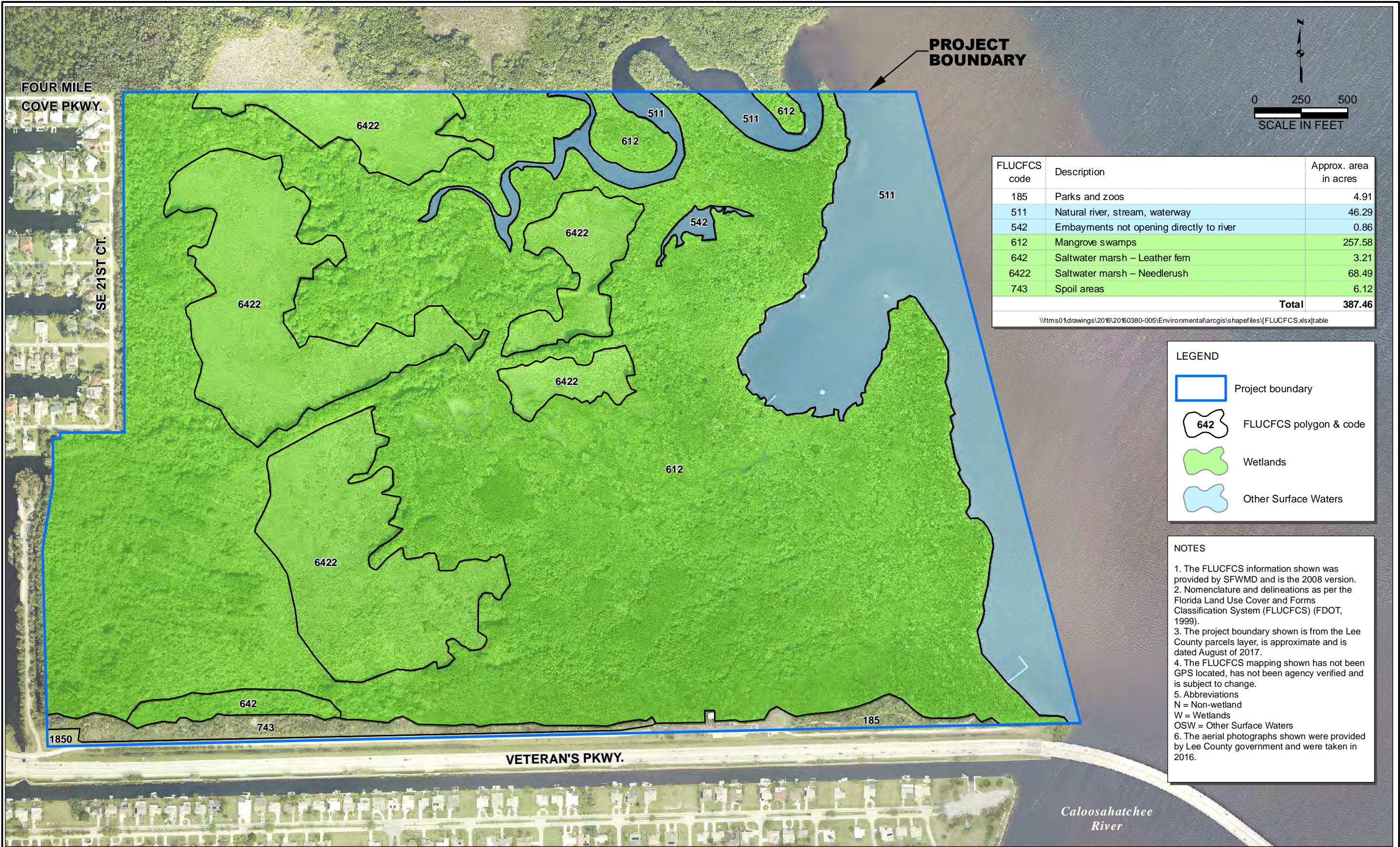
2.3 Natural Communities

Statewide Land Use Land Cover data (SLULC, 2017) combined with onsite ground truthing reveal six vegetative communities within FMCEP. **Figure 2-3** depicts the habitat mapping found on FMCEP and **Table 2-2** provides a description and acreage of habitat types found on the site. Although the FMCEP is a coastal preserve, no beaches or dunes are found on the property.

185 – Parks and Zoos: This land cover includes the visitor center, Veteran’s Memorial Park, kayak rental facilities, restrooms roads, parking lots and other facilities that comprise the physical improvements and amenities of the park. Vegetation is comprised mostly of landscape vegetation including cabbage palm (*Sabal palmetto*), slash pine (*Pinus elliottii*) and bald cypress (*Taxodium distichum*) along with plumeria (*Plumeria spp.*), wax myrtle (*Morella cerifera*), wild coffee (*Psychotria nervosa*) and other ornamental species. Invasive exotic species observed within this area include Brazilian pepper (*Schinus terebinthifolia*), melaleuca (*Melaleuca quinquenervia*), rosary pea (*Abrus precatorius*), earleaf acacia (*Acacia auriculiformis*), bishopwood (*Bischofia javanica*), carrotwood (*Cupaniopsis anacardioides*), and Old World climbing fern (*Lygodium microphyllum*)

511 – Natural River, Stream or Waterway: The Caloosahatchee River abuts the FMCEP property to the west. Additionally, a path of open water winds through the mangrove swamp in the northern portion of the site. This open water and winding backwater creek system is part of the Great Calusa Blueway offering recreational access to kayaks and canoes. Vegetation within this community is predominantly black mangrove (*Avicennia germinans*) and red mangrove (*Rhizophora mangle*).

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Four Mile Cove Eco Preserve
Lee County, Florida

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FDEP Habitat Mapping

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Nov. 2017	20160308-005	--	As Shown	3

612 – Mangrove Swamp: Mangrove forests are a vital component of the estuarine environment in southwest Florida, providing habitat for intertidal and subtidal organisms, along with nesting sites, cover and forage grounds for birds, reptiles and mammals. This forested wetland community is common in estuarine ecosystems of southwest Florida. Canopy and midstory species include red mangrove, black mangrove, white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). Occasional exotic species such as melaleuca and Brazilian pepper were also observed. Groundcover in mangrove swamps is typically sparse but may include mangrove seedlings and saltmarsh grasses such as needle rush (*Juncus roemerianus*), dropseed (*Sporobolus virginicus*), and saltgrass (*Distichlis spp.*) along with succulent herbs such as glassworts (*Salicornia spp.*), seapurslane (*Sesuvium spp.*) and saltwort (*Batis maritima*). The FWS description of mangrove communities are provided as **Appendix H**.

642 – Salt Marsh: The predominant native vegetation within this salt marsh community is giant leather fern (*Acrostichum danaeifolium*) with various mangrove species, cabbage palms (*Sabal palmetto*), and black needlerush (*Juncus roemerianus*) also present. The giant leather fern grows in coastal hammocks and in brackish and mangrove swamps and further inland along canals and pond edges. The USFWS description of the saltmarsh community is provided as **Appendix I**. Brazilian pepper is also found in this habitat with coverage of approximately 50% - 75%.

6422 – Salt Marsh (Black Needlerush): The needlerush salt marsh community of the South Florida Ecosystem is perhaps one of the most unique salt marsh systems in the United States and is a defining characteristic of FMCEP. The mild subtropical climate of Florida supports a combination of temperate salt marsh vegetation and tropical mangroves that intermix to form an important transitional ecotone. The salt marshes of FMCEP include mangrove species and saltbush (*Baccharis halmifolia*) along the perimeter. Black needlerush (*Juncus roemerianus*) is the predominant species within the salt marsh, with leatherfern also observed. Exotic species including Brazilian pepper and torpedograss (*Panicum repens*) were also observed in this habitat type (FWS MSRP, 2017)

743 – Spoil Areas: An area where fill material was placed as part of past construction activities is located immediately north of the park facilities along the southern boundary. This area is comprised of soil, rock, boulders, asphalt, and other fill materials and has been vegetated with cabbage palms, live oak (*Quercus virginiana*), wax myrtle, slash pine, Spanish needles, creeping oxeye (*Sphagneticola trilobata*) and other ruderal species. Although this area was previously disturbed, it is occupied by several gopher tortoise (*Gopherus polyphemus*) burrows.

2.4 Listed Species

A Florida Natural Areas (FNAI) Biodiversity Matrix Query provides a list of “Documented”, “Likely” and “Potential” rare species tracked by FNAI occurring within geographic Matrix Unit(s) for FMCEP. The Biodiversity Index identified was combined with knowledge of site conditions to provide three “Likely” elements occurring and 25 “Potential” elements within the Matrix Units of FMCEP. The FNAI Biodiversity Matrix is provided in **Appendix J**. Onsite investigation revealed the potential presence of four additional listed species and confirmed the presence of one additional listed species. The global and state ranks for each species was provided by FNAI and

abbreviations for ranks and statuses are defined in the FNAI Explanations and Definitions provided as **Appendix K**.

2.4.1 Listed Plant Species

The FNAI Biodiversity Matrix does not mention “Documented” or “Likely” plant species elements within the applicable Matrix Units for FMCEP. However, it does list several potential plant species, which are considered to potentially be found at FMCEP. The FNAI list was collated with knowledge of local botany to provide the following Potential Plant Species as shown in **Table 2-2**.

Table 2-2: FNAI Biodiversity Matrix, Potential Plant Species

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Listing
Golden Leather Fern	<i>Acrostichum aureum</i>	G5	S3	N	T
Iguana Hackberry	<i>Celtis iguanaea</i>	G5	S1	N	E
Spiny Hackberry	<i>Celtis pallida</i>	G4	S1	N	E
Beautiful Pawpaw	<i>Deeringothamnus pulchellus</i>	G1	S1	E	E
Narrow-leaf Carolina Scalystem	<i>Elytraria caroliniensis</i> var. <i>angustifolia</i>	G4T2	S2	RT	N
Sanibel Love Grass	<i>Eragrostis pectinacea</i> var. <i>tracyi</i>	G5T1	S1	N	E
Nodding Pineweed	<i>Lechea cernua</i>	G3	S3	N	T
Florida Beargrass	<i>Nolina atopocarpa</i>	G3	S3	N	T
Hand Fern	<i>Ophioglossum palmatum</i>	G4	S2	N	E
Ray Fern	<i>Schizaea pennula</i>	G5	S1	N	E
Banded Wild-Pine	<i>Tillandsia flexuosa</i>	G5	S3	N	T

2.4.2 Listed Animal Species

The FNAI Biodiversity Matrix does not mention “Documented” species within the applicable Matrix Units for FMCEP. However, it does list three “Likely” species as shown in **Table 2-3**. Additionally, onsite investigations and local research revealed the presence of gopher tortoises within FMCEP, and the likely presence of little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), roseate spoonbill (*Platalea ajaja*) and tricolored heron (*Egretta tricolor*) within the mangroves and salt marshes and smalltooth sawfish (*Pristis pectinata*) within the Caloosahatchee River near FMCEP. These species have been added to **Table 2-3**.

Table 2-3: FNAI Biodiversity Matrix, Likely Animal Species

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Listing
Little Blue Heron	<i>Egretta caerulea</i>	G5	S4	N	ST
Reddish Egret	<i>Egretta rufescens</i>	G4	S2	N	ST
Roseate Spoonbill	<i>Platalea ajaja</i>	G5	S2	N	ST
Tricolored heron	<i>Egretta tricolor</i>	G5	S4	N	ST
Wood Stork	<i>Mycteria americana</i>	G4	S2	LT	FT
West Indian Manatee	<i>Trichechus manatus</i>	G2	S2	LT	FT
Florida Bonneted Bat	<i>Eumops floridanus</i>	G1	S1	LE	FE
Gopher Tortoise	<i>Gopherus polyphemus</i>	G3	S3	C	ST
American Crocodile	<i>Crocodylus acutus</i>	G2	S2	FT	FT
Smalltooth Sawfish	<i>Pristis pectinata</i>	Un	Un	LE	FE

The FNAI Biodiversity Matrix includes ten “Potential” animal elements occurring within the Matrix Units of FMCEP, as shown in **Table 2-4**.

Table 2-4: FNAI Biodiversity Matrix, Potential Animal Species at FMCEP

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Listing
Potential Elements (Fish)					
Mangrove Rivulus	<i>Rivulus marmoratus</i>	G4G5	A3	SC	N
Potential Elements (Birds)					
Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	G4T3	S3	N	SSC
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>	G5T2T3	S2S3	N	ST
Florida Clapper Rail	<i>Rallus longirostris scottii</i>	G5T3	S3	N	N
Snail Kite	<i>Rostrhamus sociabilis</i>	G4G5	S2	LE	N
Florida Prairie Warbler	<i>Setophaga discolor paludicola</i>	G5T3	S3	N	N
Potential Elements (Reptiles)					
Eastern Indigo Snake	<i>Drymarchon couperi</i>	G3	S3	FT	FT
Loggerhead Turtle	<i>Caretta caretta</i>	G3	S3	FT	FT

2.5 Invasive Species

Invasive plant species observed at FMCEP include Brazilian pepper, torpedograss, melaleuca, rosary pea, earleaf acacia, bishopwood, carrotwood, and Old-World climbing fern. These exotic invasive plant species can outcompete native plants and typically reduce native plant species coverage and diversity. **Appendix L** provides the 2017 Florida Exotic Pest Plant Council (FLEPPC) List of Invasive Plant Species. Below is a brief description of each invasive species along with appropriate management strategies:

Brazilian Pepper: Brazilian pepper is a medium-sized evergreen shrub-like tree native to Brazil and Paraguay. Brazilian pepper produces dense clusters of small berries that change from green to bright red as they ripen. This small tree, typically 15 to 30 feet in height, is the most widespread of Florida's nonnative invasive plant species occupying more than 700,000 acres. Although primarily an invader of landscapes in which the soil has been disturbed and fire excluded, it has formed large dense forests in relatively undisturbed areas adjacent to mangroves along the southwestern portion of Everglades National Park and within the coastal areas of West Central and South Florida (FWC, 2019). Brazilian pepper was the most pervasive invasive plant species observed at FMCEP. This Category I (FLEPPC, 2019) invasive species has encroached into the leather fern marsh along the southern boundary of the preserve, covering between 50% and 75% of this habitat. Brazilian pepper was also observed within several needlerush marshes of the preserve with coverage ranging from 10% to 25%. Due to the soft soils and high-water tables associated with most of the preserve, mechanical removal methods may not be practical. If mechanical removal is utilized, it would likely be conducted using hand tools followed immediately by treatment of the stump with an appropriate herbicide. Chemical control methods such as basal bark and cut stump treatments using appropriate herbicides may offer the best management technique for this species. The best time to treat Brazilian pepper is when they are not fruiting because seeds contained in the fruits have the capability of producing new trees. (UF IFAS, 2019).

Torpedograss: Torpedograss was observed within the needlerush marshes. Torpedograss is one of the most serious weeds in Florida, and is designated as a Category I (FLEPPC, 2019) invasive exotic. It grows in or near shallow waters forming monocultures where it can quickly displace native vegetation. Management of torpedograss typically involves the use of appropriate herbicides. Glyphosate has been an effective herbicide used to control torpedograss. These herbicides are systemic (move throughout plant tissue) so care must be exercised to minimize off-target damage. Torpedograss is most difficult to control when partially submersed in water. Regardless of habitat conditions, multiple resprays may be required for complete control. (UF IFAS, 2019)

Melaleuca: Melaleuca is a large evergreen tree typically 65 feet in height with a brownish white, many-layered papery bark. Population estimates indicate melaleuca trees inhabit more than 400 thousand acres, mostly in South Florida (FWC, 2019). Management of melaleuca typically requires a combination of mechanical, chemical and/or biological control agents. Past management efforts at FMCEP focused on the treatment of large stands of melaleuca resulting in reduced coverage of this Category I (FLEPPC, 2019) invasive exotic species since the last management plan was published.

Rosary Pea: Rosary pea is a high-climbing, twining or trailing woody vine with slender herbaceous branches and 3-8 brilliant red seeds with one black spot. The native range of rosary pea includes India and parts of Asia, but it has been widely used in Florida as an ornamental plant for many years. This Category I invasive species (FLEPPC, 2019) can invade and displace native plant communities and is found throughout central and southern Florida. Typical of many vining plants, rosary pea can grow over small trees and shrubs and its roots grow very deeply onto the ground and are very difficult to remove. Fire encourages the growth of rosary pea. Interestingly, one of the deadliest plant toxins, abrin, is produced by rosary pea.

Earleaf Acacia: Earleaf acacia is an evergreen tree that reaches heights up to 50 feet. Leaves are blade-like, slightly curved, and 5-8 in long. Native to southeast Asia, this species was introduced to the U.S. pre-1930 and used extensively in street landscaping in southern Florida for many years. Now common in disturbed areas, it has invaded pinelands, scrub, and hammocks. Bright yellow flower stalks appear spring through fall. Seeds are dispersed by several bird species (Rookery Bay, 2019).

Bishopwood: Bishopwood is an evergreen tree growing 35 – 60 feet in height with dense, rounded head, smooth branches and milky sap. Bishopwood a Category I exotic (FLEPPC, 2019) native to southern Asia, but becoming common in central Florida and the south peninsula. Bishopwood grows in old fields and disturbed wetland sites; invading intact cypress domes and tropical hardwood hammocks, where it displaces native vegetation and alters the structure of the plant community. Occasionally found in disturbed hammocks (UF/IFAS, 2019).

Carrotwood: Carrottwood is a slender evergreen tree, usually single-trunked growing to 33 feet tall with dark gray outer bark and often orange inner bark (UF/IFAS, 2019). This Category I invasive (FLEPPC, 2019) exotic invades spoil islands, beach dunes, marshes, tropical hammocks, pinelands, mangrove and cypress swamps, scrub habitats, and coastal strands; greatly altering understory habitat.

Old-World Climbing Fern: Old World climbing fern is an aggressive nonnative invasive fern of moist habitats in South Florida, and is designated as a Category I (FLEPPC, 2019) invasive exotic. This rapidly spreading fern invades new areas without the need of habitat disturbance and often completely dominates native vegetation by forming a dense canopy. The fern now infests more than 200,000 acres in South Florida public areas, private preserves, nurseries and other managed land. The fern's ability to grow up and over trees and shrubs and to form dense horizontal canopies allows it to cover whole communities of plants reducing native plant diversity. Old World climbing fern can grow in bald cypress stands, pine flatwoods, wet prairies, saw grass marshes, and mangrove communities. The fern poses management problems for both wildfires and prescribed burns because it can serve as a fire ladder that carries fire into the tree canopy that kills native trees (FWC, 2019).

2.6 Water Resources

FMCEP is located on the northwest bank of the Caloosahatchee River. According to the Surface Water Boundaries map provided by the FDEP Map Direct Gallery (FDEP, 2019), the designated uses for this portion of the Caloosahatchee include fish consumption, recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife (CLASS III). The nearest surface waters classified as potable water supplies (CLASS I) are located approximately 15 miles east of FMCEP beginning at Franklin Lock. San Carlos Bay is the closest surface water classified as shellfish propagation or harvesting (CLASS II approximately eight miles southwest of FMCEP).

2.7 Forest and Mineral Resources

The deed to the State transferred fee simple interest and did not reserve any mineral or other rights by the grantor. Accordingly, the State holds title to all forest and mineral rights for this property. No mineral extraction or forestry practices have occurred on the site in the last 40 years. Additionally, the topographic conditions and natural vegetative communities found on FMCEP impede the development of forest and mineral resources on the property. Currently, there are no plans to pursue the development of forestry or mineral resources on the site.

2.8 Cultural, Archaeological and Historical Resources

According to a Negative Project Area letter provided by Florida Department of State, Division of Historical Resources (DHR) dated November 7, 2017 (**Appendix M**), the Florida Master Site File lists no previously recorded cultural resources within the project area.

2.9 Scenic Resources

FMCEP includes approximately 68.49 acres of relatively unaltered needle rush marsh along with 257.58 acres of natural mangrove habitat. Healthy mature mangrove forests and swamps are accessed from water by Four Mile Cove and meandering creeks or from land by boardwalks and pedestrian trails that offer a tranquil respite from the sights and sounds of a busy city. The proximity of FMCEP to residential areas and Veteran's Memorial Parkway provides residents and visitors easy access to the intrinsic scenic and natural resources provided by this unique preserve. The scenic and natural significance of FMCEP has led to its incorporation into the Great Calusa Blueway project, (**Appendix N**) a 190-mile marked canoe and kayak trail that meanders through the coastal waters and inland tributaries of Lee County (Fort Myers-Sanibel, 2019).

3.0 USE OF THE PROPERTY

3.1 Surrounding Land Use

FMCEP is located on the eastern boundary of the City of Cape Coral just north of Veteran's Memorial Parkway. Much of this area is zoned for and has been developed as single and multi-family residential (Cape Coral Zoning, 2017). Currently, single and multi-family dwellings are located to the west of the property and south of Veteran's Memorial Parkway with the Caloosahatchee River adjacent to the east of the property. There is vacant land to the north of FMCEP that is zoned for single family residential. Currently, the existing adjacent land uses do not conflict with the current and planned use of FMCEP.

3.2 Development and Previous Use

Development of FMCEP began in 1977 when the property was sold to BOT by the developer of Cape Coral, GAC Properties. The property was sold as an ecological preserve and included restrictions on its use to ensure the enjoyment of the property in its natural state. Uses of the property included wildlife habitat, cultivation and preservation of native plant species, recreation, and preservation of wetlands and mangroves. Due to the coverage of saltwater wetlands including mangrove swamps and saltwater marsh, uses prior to development were likely limited to fishing and other recreational uses.

3.3 Current Public Use

FMCEP is a brackish water wetland preserve that features an elevated boardwalk, gravel walking trails, visitor center, Veterans Memorial Area, picnic area, kayaking and seasonal kayak rentals. The visitor center includes 26 paved parking spaces, two restrooms, and access to the walking trail and fishing piers within the southeastern portion of the preserve. On the south side of the parking lot is the Veterans Memorial Area, which includes several monuments designed to recognize and honor those who have served our country through the U.S. armed services. (Cape Coral Parks and Rec, 2017). The kayak rental facility is located along the western boundary of the preserve and includes five paved parking spaces and about 20 unpaved parking spots. This area provides canoe and kayak access to meandering canals and waterways within the preserve, terminating at the Caloosahatchee River. The park offers guided tours, veteran ceremonies, hiking, kayaking, fishing, bird watching, geocaching, wildlife observation and educational opportunities.

3.4 Planned Public Use

Cape Coral does not plan to alter the permitted uses at FMCEP. However, the City looks to improve the amenities of FMCEP by expanding the existing boardwalk and shell pathways to include a continuation of the lost pond loop boardwalk and a shell path trail beginning near the trailhead of the mangrove boardwalk meandering through upland areas on the north side of SE 24th Street toward the kayak rental facility on the western boundary of the property. Additionally, a new environmental center is proposed near the southwest corner of the property in an area that was previously cleared and filled that would allow additional environmental education opportunities for patrons of FMCEP. The City also plans to update the existing welcome center to include new displays, revised layout and increased security. Hurricane Irma also damaged some FMCEP

facilities including some of the existing boardwalk and the floating docks in Four-Mile Cove. The City will pursue repairing or replacing these amenities. Finally, the City hopes to add a boardwalk to provide access to one of the needlerush marshes to allow visitors to observe and learn about this rare southwest Florida habitat and extend the portage boardwalk allowing easier kayak access to Four-Mile Cove. All future development of approved and conditional uses at FMCEP would be reviewed by applicable agencies including, but not limited to SFWMD, FDEP, USACE, FWC, FWS and the City's own land use and development ordinances.

3.5 Multiple-Use Potential

The City of Cape Coral evaluated the following activities and uses for their suitability with the resources provided at FMCEP. "Approved" uses are deemed to be appropriate with the resources of FMCEP. These uses are in accordance with the purposes of state-owned lands, the Conceptual State Lands Management Plan, and comply with Cape Coral Parks and Recreation Department mission, goals and objectives. "Conditional" means the use may be acceptable but will be allowed only if approved through a process other than the land management plan development and approval process. "Rejected" means the use is not appropriate for FMCEP. **Table 3-1** provides a list of approved, conditional and rejected uses at FMCEP.

Table 3-1: Multiple-Use Potential

Activity / Use	Approved	Conditional	Rejected
Agriculture			X
Apiaries		X	
Astronomy		X	
Bicycling	X		
Camping		X	
Cattle grazing			X
Ecosystem maintenance	X		
Ecotourism	X		
Environmental education	X		
Fishing	X		
Geocaching	X		
Hiking	X		
Horseback riding			X
Hunting			X
Linear facilities			X
Off road vehicle use			X
Preservation of archaeological and historical sites	X		

Activity / Use	Approved	Conditional	Rejected
Protection of endangered or threatened species	X		
Soil and water conservation	X		
Swimming			X
Timber harvest			X
Veterans Memorial	X		
Wildlife observation	X		

3.6 Incompatible Uses

Consideration of incompatible at FMCEP are made in accordance with Section 253.034(10). Upon approval and implementation of this management plan, any proposed future uses that have been classified herein as Rejected will be reviewed by the City of Cape Coral for compliance with local land use regulations and forwarded for review to DEP-DSL, the ARC, and the BOT. Currently, rejected uses include horseback riding, hunting, linear facilities, off-road vehicle use, swimming and timber harvesting.

3.7 Potential Land Acquisition

Most of the property surrounding FMCEP is comprised of existing single and multi-family dwellings and Veteran's Memorial Parkway to the south. However, vacant property comprised of three parcels exists to the north of FMCEP. These three parcels cover approximately 120.62 acres and include uplands, wetlands, and aquatic habitat. Lee County Property Appraiser records indicate that this property is owned by Ripple Lake, LLC. Habitat mapping provided by FDEP indicates that vegetative communities on the property include needle rush marsh, mangrove swamps and a portion of Alligator Creek. As this site offers additional opportunities for the preservation of sensitive mangrove and needlerush habitats, acquisition or preservation of this property would benefit FMCEP and the residents of Cape Coral. However, no formal or informal investigation into the acquisition of this property has been made. A map depicting the optimal boundary for FMCEP is included as **Figure 3-1**.

3.8 Potential Surplus Lands

All lands within FMCEP are necessary for the ongoing successful management of the preserve, and none should be considered surplus.

\\fms01\drawings\2016\20160380-005\Environmental\arcgis\optimal boundary map.mxd Date: 8/20/2019 Time: 9:52:12 AM User: pml



Four Mile Cove Eco Preserve
Lee County, Florida



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E.B. #642 & L.B. #642

Optimal Boundary Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Aug. 2019	20160308-005	--	As Shown	1

3.9 Use Management

The City of Cape Coral intends to continue managing FMCEP as a multiple-use property in accordance with provisions of managing agencies such as FDEP, USACE, SFWMD and the City's own development regulations. FMCEP is not managed by a private party in anticipation of any state purchase. Applicable land use and development regulations for the Preserve (PRES) zoning district within the City of Cape Coral can be found in **Appendix D**. The primary uses of FMCEP continue to be environmental preservation and education along with passive recreational activities associated with the walking trails, visitor center, Veterans' Memorial Area, picnic area, kayaking and seasonal kayak rentals. These uses represent a balanced public utilization for FMCEP.

4.0 MANAGEMENT GOALS, OBJECTIVES, AND ISSUES

The following section provides a description of the City's plans to locate, identify, protect, preserve, or otherwise use fragile natural resources and nonrenewable historical resources. In general, Cape Coral intends to preserve native habitat at FMCEP while offering recreational and educational opportunities to learn about and enjoy natural communities occurring in southwest Florida. FMCEP will continue to provide facilities to honor members of the armed services in the Veterans' Memorial Area located along the southern boundary of the preserve. Furthermore, as noted earlier, the management activities described in this section are in compliance with those of the Conceptual State Lands Management Plan.

4.1 Resource Management

4.1.1 Soils

As previously stated, FMCEP is comprised of four soil types including Wulfert Muck, Kesson Fine Sand, Oldsmar Sand and Matlacha Gravelly Fine Sand, along with open water. Wulfert Muck and Kesson Fine Sand are susceptible to erosion by wave activity or if vegetation is removed or disturbed. The best way to ensure that these sensitive wetland soils remain intact is to ensure coverage of beneficial native species suitable to those soils such as mangroves, needlerush and leather fern are managed in perpetuity. Removal of exotic vegetation species such as Brazilian pepper, melaleuca and torpedograss will reduce the potential for future disturbance of the soil associated with more intensive management practices such as mechanical clearing.

4.1.2 Hydrology

The hydrology of FMCEP is mostly tidal wetlands. Salinity of these wetland areas varies based on local and regional rainfall and discharges of freshwater from Lake Okeechobee and the Cape Coral canal networks. The City of Cape Coral will continue to work with the SFWMD and USACE to manage freshwater discharges from Lake Okeechobee to avoid adverse hydrologic impacts to FMCEP.

4.1.3 Natural Communities

Currently, the greatest threat to the natural communities found at FMCEP is the increased coverage of invasive exotic plant species including Brazilian pepper, torpedograss, melaleuca, bishopwood, carrotwood, and Old-World climbing fern. Other exotic species including lead tree (*Leucaena leucocephala*) are also found onsite but have not affected coverage of desirable species. The City has actively managed exotic vegetation within the project and has dramatically reduced the coverage of melaleuca on the site. However, coverage of species such as Brazilian pepper and torpedograss continue to expand, threatening the saltwater marsh habitats by out shading and outcompeting native species such as needlerush and leather fern. Coverage of Brazilian pepper approaches 75% in the leather fern marsh and has established a foothold within several needlerush marshes. Additional funding to conduct large scale invasive exotic vegetation removal would help ensure the health of the sensitive ecosystems found within FMCEP by removing competition for existing native species

and removing the seed source allowing exotic species to continue expanding into the otherwise healthy systems.

Additionally, recent aerial photographs show a decrease in marsh areas compared to historic aerials. This is due to increased coverage of mangrove species such as black and red mangroves over the last several years. Black and red mangroves often outcompete herbaceous species resulting in a proportional decrease in coverage of needlerush marsh.

Four Mile Cove and the Caloosahatchee River also presents unique natural community management opportunities. Studies have shown that since 2001 over 2,000 acres of freshwater tape grass (*Vallisneria americana*) have been lost from the upper Caloosahatchee estuary due to anthropogenic releases and environmental factors including drought, algal blooms, and excessive herbivory (Bortone and Turpin 2000, Ceilley and Bortone 2003, Ceilley et al. 2012, SFWMD mapping 1994-2015). **Appendix O** depicts 1993 submerged aquatic vegetation (SAV) in the Caloosahatchee Estuary. The area of FMCEP included dense stands of tape grass and scattered widgeongrass (*Ruppia maritima*). Tape grass provides habitat for at least 44 species of fishes including snook, sea trout, black and red drum, and largemouth bass. It is considered a Valued Ecosystem Component (VEC) by State and Federal Agencies in the Caloosahatchee as part of the Comprehensive Everglades Restoration Project. Restoration of tape grass meadows in the Caloosahatchee River and estuary has been identified as a priority by the State of Florida and the SFWMD. Collaboration between the City of Cape Coral and other agencies like Lee County, SFWMD, Snook and Gamefish Foundation, Sanibel-Captiva Conservation Foundation and others could provide opportunities to increase the density of tape grass within Four Mile Cove and other creeks within FMCEP.

4.1.4 Listed Species Management

Several species listed as threatened or endangered by the FWS or FWC have been observed on FMCEP or their presence is determined “Likely” by the FNAI Biodiversity Matrix including wood stork, west Indian manatee, Florida bonneted bat, gopher tortoise and smalltooth sawfish. Additionally, the FWC online Eagle Nest Locator (FWC, 2018) indicates that a bald eagle nest (Nest LE 067) was located near FMCEP but has not been listed as active since 2013. Management techniques for each species are discussed below.

Wood Stork: Habitat for the wood stork is typically comprised of freshwater and brackish wetlands. Foraging, roosting and nesting are strongly associated with wetland habitats where wood stork colonies construct nests in trees occurring in swamps or on islands (FWS, 1999). The FWS established Core Foraging Areas with a radius of 18.6 miles from wood stork colonies in South Florida. The closest known wood stork colony to the FMCEP site is located up the Caloosahatchee River approximately 7.3 miles to the northeast near, Midway Island.

Maintaining healthy wetland habitats onsite will continue to offer forage and roosting opportunities for wood storks. The City of Cape Coral plans to expand existing boardwalks to the needlerush marsh(es) and construct an environmental center. Any projects proposing wetland impacts within the 18.6-mile Core Foraging Area of a wood stork colony may require review by the FWS and USACE under the Section 404 dredge/fill permit application process to determine whether compensatory mitigation may be required for the loss of foraging habitat.

Imperiled Wading Birds:

Wading birds depend on healthy wetlands, mangrove and other habitats suitable for resting and breeding, and which are near foraging habitat. Four species of wading birds including the little blue heron (*Egretta caerulea*), reddish egret (*E. rufescens*), roseate spoonbill (*Platalea ajaja*), and tricolored heron (*E. tricolor*), are listed as Threatened by the State, while snowy egret (*E. thula*) and white ibis (*Eudocimus albus*) have been recently delisted. (FWC, 2013)

The little blue heron, roseate spoonbill, snowy egret, tricolored heron, and white ibis forage in shallow marine, brackish, or freshwater sites, including tidal ponds and sloughs, mudflats, mangrove-dominated pools, freshwater sloughs and marshes, and human-created impoundments (Figure 1). The white ibis and little blue heron rely on freshwater forage sites to raise young until they become more salt tolerant (Frederick 1996, Rodgers 1996). Reddish egrets are restricted to coastal areas of Florida and forage in mostly shallow marine environments such as sandbars and sandy shorelines that are devoid of grass. Nesting occurs on coastal islands near foraging sites (FWC, 2013).

The FMCEP LMP includes projects such as the lost pond loop boardwalk and needlerush marsh boardwalk expansions within habitat utilized by Imperiled Wading Birds. However, any such project would be constructed in accordance with the Species Action Plan for Six Imperiled Wading Birds published by FWC as included in **Appendix P**. Additionally, the City, in collaboration with other entities may consider future habitat restoration projects where native forage vegetation such as tapegrass is installed within Fourmile Cove to provide enhanced habitat for manatees and other species.

West Indian Manatee: Habitat for the West Indian manatee includes both fresh and saltwater areas offering a variety of forage vegetation including tapegrass, turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), and shoal grass (*Halodule wrightii*). Manatees often prefer quiet portions of canals, creeks and lagoons for feeding and social interactions. FMCEP provides this quiet habitat within the cove and creeks abutting the Caloosahatchee River.

At this time, the City of Cape Coral does not propose any projects that would affect West Indian manatee habitat. However, the City, in collaboration with other entities may consider future habitat restoration projects where native forage vegetation such as

tapegrass is installed within Fourmile Cove to provide enhanced habitat for manatees and other species.

Florida Bonneted Bat: The Florida bonneted bat (FBB) was listed as endangered by FWS in 2013, and the FMCEP site is within the designated Consultation Area. FBBs are known to roost in both natural and artificial structures, including tree cavities, foliage, rock crevices, buildings, bridges and bat houses. Acoustic surveys using ultrasonic microphones are typically used to survey for the presence of FBB and their roosts. Although no surveys for FBB have been conducted on the FMCEP site, wooded areas in proximity to residential and commercial areas provide appropriate foraging habitat for this large bat species.

The City of Cape Coral plans to develop projects such as the environmental center, expanded boardwalk and walkways which could potentially affect FBB. These projects will be designed to minimize impacts to wetlands and native vegetation, which will reduce potential adverse effects to FBB. Additionally, FMCEP could be utilized to host educational seminars allowing residents to learn about and observe bats found in Cape Coral. These seminars could include the use of acoustic recorders to classify the species of bats using the site and/or the construction of bat houses to entice bats to colonize the property.

Gopher Tortoise: Several gopher tortoise burrows were observed along the north side of SE 24th Street during field observations in areas that were filled in the past. Gopher tortoises typically dig burrows in well drained, sandy soils. Their preferred forage includes a wide variety of low growing broadleaf grasses, legumes, asters, and various seasonal fruits. FWC has listed the gopher tortoise as “Threatened” and offers protection to the tortoise, eggs, and its burrow from development and other threats.

The City of Cape Coral plans to develop a walking path from the southern parking area west and north to the kayak rental facility. Siting any proposed improvements within areas occupied by gopher tortoises a minimum of 25 feet from any potentially occupied burrow will ensure adverse effects are avoided. If impacts within 25 feet of potentially occupied gopher tortoise burrows are unavoidable, the City could pursue relocation in accordance with the Gopher Tortoise Permitting Guidelines published by FWC.

Smalltooth Sawfish: The smalltooth sawfish inhabits shallow coastal waters of tropical seas and estuaries over muddy and sandy bottoms. They are known to swim inland in river systems and have been shown to have a salinity preference of 18 – 24 parts per thousand (NMFS, 2017). The smalltooth sawfish is listed as “Endangered” by the USFWS and areas of Critical Habitat for the species have been dedicated, including the Caloosahatchee River downstream of the Franklin Lock.

At this time, the City of Cape Coral does not propose any projects that would affect smalltooth sawfish habitat. However, the City, in collaboration with other entities may consider future habitat restoration projects where native forage vegetation such as

tapegrass is installed within Fourmile Cove to provide enhanced habitat for sawfish and other species.

4.1.5 Exotic / Invasive Species Management

Exotic Vegetation: Management of exotic and invasive species is paramount to the continued success of FMCEP. Invasive species including Brazilian Pepper, torpedograss, melaleuca, rosary pea, earleaf acacia, bishopwood, carrotwood and Old-World climbing fern have established themselves within the preserve and displaced native species such as needlerush, mangroves and leather fern. Treatment of Brazilian pepper, melaleuca, earleaf acacia, bishopwood, and carrotwood would likely be through the use of hand tools (chainsaw and machete) combined with the application of appropriate herbicides. Treatment methods include cut stump, where vegetation is cut down and the stump is treated with herbicide and the basal bark method where the bark of the tree is removed, exposing the cambium layer followed by the application of appropriate herbicide. Where practical, the cut vegetation should be removed from the site. If hand removal of the vegetative debris is not practical, letting material fall to the ground where moisture aids its decomposition may be an acceptable alternative. Treatment and management of torpedograss, rosary pea, and Old-World climbing fern requires the regular application of appropriate herbicides and removal of seed source if possible. Successful treatment of these species may require several quarterly or semi-annual applications of appropriate herbicide.

Exotic Animals:

Cape Coral is home to three species of large, invasive lizards: the Nile Monitor (*Varanus niloticus*), the Green Iguana, (*Iguana iguana*) and the Spiny-tailed Iguana (*Ctenosaura pectinata*). While both types of iguana are found all over Florida, Nile Monitors are unique to this area. They were introduced sometime before 1990, probably as a result of the pet trade, and the population in Cape Coral is believed to be over one thousand (Cape Coral Public Works, 2019).

Nile Monitor: Nile Monitors are carnivores, and they are extremely effective predators. Nile monitors eat fish, turtles, mollusks, birds, mammals, and eggs. They live in burrows in the ground, generally near canals. They are excellent swimmers, able to hold their breath for up to an hour and can run up to 18 mph on land. Nile Monitors can grow to 7 feet long, so the potential harm to wildlife in the area - including burrowing owls - is great (Cape Coral Public Works, 2019).

Green Iguana: Green iguanas are large, typically green, brown or black lizards with dark rings on the tail and a row of spikes down the center of the neck, back, and upper portion of the tail. Mature male iguanas develop heavy jowls and a throat fan (or dewlap) that are much larger than those of female. Green iguanas can grow to over five feet in length, with males weighing up to 17 pounds (FWC, 2019).

Green iguanas cause damage to infrastructure by digging burrows that erode and collapse sidewalks, foundations, seawalls, berms and canal banks. Green iguanas also

damage residential and commercial landscape vegetation and are often considered a nuisance by property owners (FWC, 2019).

Spiny Tailed Iguana: The spiny tailed iguana is typically smaller than the green iguana. They are black or gray in color with darker mottling or bands present. The lizards have tails ringed with rows of sharp, curved spines, hence the name spiny-tailed iguana. The spines down the back are short (Animal Diversity Web, 2019). Although present in Cape Coral, these lizards have not established themselves to the extent that the green iguana and Nile monitor have.

Nile monitors and iguanas are invasive species in Florida. They are not protected in Florida except by anti-cruelty laws. (Cape Coral Public Works, 2019)

The City has conducted Nile monitor trapping programs in the southwestern portion of Cape Coral. Reports of Nile monitors or iguanas will be investigated by the City and private trappers or City staff will trap the lizards when needed.

4.1.6 Forest Resources Management

The habitat types found at the FMCEP site do not provide manageable forest or timber resources.

4.1.7 Fire Management

The application of prescribed fire at FMCEP has been utilized in the past to help control exotic and nuisance vegetative species and mimic a more natural ecosystem. Although the FMCEP is surrounded by residential uses, an appropriate fire plan in accordance with Florida Department of Agriculture and Consumer Services (FDACS) and Florida Forest Service (FFS) guidelines provides an effective and efficient tool to reduce fuel load on the site, reduce coverage of certain species and increase biodiversity in the groundcover stratum. The use of prescribed fire as a management tool at FMCEP could occur if a suitable prescribed burn plan is prepared. Any prescribed fires would be conducted by a State certified prescribed burner in accordance with the FFS.

4.1.8 Mineral Resource Management

No mineral resources are identified or managed within FMCEP.

4.1.9 Cultural Resources Management

According to a Negative Project Area letter provided by Florida Department of State, DHR, the Florida Master Site File lists no previously recorded cultural resources within the project area. If necessary, the City will request a Compliance Review with the Division of Historical Resources on proposed projects that could affect Cultural Resources.

The City will consult with the Division of Historical Resources, Department of State before taking actions that may adversely affect archaeological or historical resources.

4.1.10 Scenic Resource Management

The unique combination of recreational resources offered by FMCEP provide various scenic vistas to visitors. Managing the scenic resources of FMCEP will require the ongoing maintenance of the existing boardwalks and walking paths throughout the site. Construction of additional boardwalks, walking paths, and an environmental center will provide access to the needlerush and leather fern marshes.

Ongoing management of exotic vegetation is necessary to increase the value of scenic resources of FMCEP, especially within the needlerush and leather fern marshes. Currently, Brazilian pepper and torpedograss outcompete native marsh vegetation in portions of the preserve.

The potential use of the property by protected wildlife species, including West Indian manatees and smalltooth saw fish, also provide additional scenic resources that could be enhanced through management of submersed native vegetation within Four Mile Cove. Collaboration between the City, Lee County, the Florida Sea Grant, Snook and Gamefish Foundation and other organizations to install tape grass or other appropriate native submersed vegetation may be pursued to increase wildlife viewing opportunities.

4.1.11 Security

Hours for FMCEP are from 8:00 am to dusk, year-around. Security for FMCEP is provided by the Cape Coral Police Department. Cape Coral will continue to keep FMCEP on the typical patrol route to help keep FMCEP secure.

4.1.12 Arthropod Management

The location of FMCEP along the Caloosahatchee River and near residences along with the wetland habitats found on the site make the appropriate management of mosquitos and other arthropods an important part of the LMP. To help track future arthropod management issues and concerns, a copy of the Arthropod Management Plan for Public Lands developed and published by FDACS Division of Agricultural Environmental Services has been included as **Appendix Q**.

4.2 Education and Training

The unique habitats and amenities offered at FMCEP require specific knowledge of wildlife management, habitat management, and facilities maintenance and management. FMCEP is one of the only preserves in the area where visitors can walk into a mangrove forest and experience this unique, coastal environment up close without accessing it by boat. Currently, the City of Cape Coral does not have staff with this background in a management position. Staff members who are trained and knowledgeable in the management of natural areas would be ideal for management of this preserve.

In addition to trained knowledgeable management staff, additional training of maintenance staff and others who may interact with the public would increase the benefit of FMCEP to its patrons. Training on specific plant and animal species found at FMCEP, the role of the mangrove forests and salt marshes in the southwest Florida environment, and the benefit of sustainable park maintenance practices would enhance the interaction between staff, visitors and the park itself.

4.3 Public Access and Use

FMCEP is open to the public from 8:00 am until dusk all year. The kayak rental facility is open from 8:00 am until 4:00 pm on weekends from November through May. FMCEP provides parking spaces for up to 46 vehicles and includes spaces for buses and other larger vehicles. The parking areas provide access to the visitor center, boardwalks, trails, kayak rental facility and Veteran's Memorial Park. Educational tours and events along with veteran's ceremonies can be scheduled at FMCEP offering these amenities to schools, community groups and other organizations.

4.4 Operations and Facilities

Management responsibilities at FMCEP are borne by the City and include environmental programing and scheduling, maintenance of park facilities, employee management, natural areas management including exotic removal and managing for imperiled species, seasonal kayak rental, maintenance and management of kayak fleet and equipment and rental operations.

4.4.1 Funding.

The FMCEP receives funding from several separate sources including The Tourist Development Council (TDC), kayak rentals, donations from the VMMCT and funding from the City and FWC.

The TDC is an advisory committee to the Lee County Board of Commissioners and oversees the distribution of taxes collected through the tourist development tax fund. Each year the TDC approves funding for the maintenance of Lee County beaches, beach re-nourishment projects, parks and shoreline capital projects such as piers and boardwalks (LCVCB, 2018). Currently, the FMCEP receives \$52,500 annually for maintenance and staffing requirements. The kayak rental shack generates

approximately \$11,000 per year and the City funds approximately \$15,000 per year in exotic vegetation removal staffing and materials. FMCEP also receives funding from FWC for ongoing exotic vegetation management. Donations toward maintenance and improvement of the veterans' memorial varies year to year.

5.0 MANAGEMENT PRACTICES

5.1 Habitat Restoration

One of the primary goals of the FMCEP is to provide residents and visitors of Cape Coral an opportunity to experience healthy coastal ecosystems near City amenities. The management of FMCEP to maximize ecological and environmental benefits for patrons of the park provides education and entertainment opportunities for citizens and visitors alike. The habitat restoration goals can be broken down by exotic vegetation management projects, prescribed burning, and aquatic habitat restoration projects.

5.1.1 Exotic Vegetation Removal

The control of exotic vegetation within FMCEP is one of the most important management activities ensuring that these coastal habitats do not degrade over time. Exotic species such as Brazilian pepper and melaleuca have historically been managed at FMCEP, but efforts to combat their spread is still required. Other exotic species including carrotwood, earleaf acacia, bishopwood and Old-World climbing fern will also need to be treated. The effect invasive exotic vegetation could have on the saltwater marsh habitats is one of the most pressing issues for FMCEP. Whereas mangrove species, once established, are typically taller than Brazilian pepper and therefore shade them out, the saltwater marsh habitats offer nearly unobstructed access to sunlight. Additionally, once Brazilian pepper is established, coverage of desirable groundcover species such as needle rush and leather fern typically reduce significantly.

Short term priorities for exotic vegetation management include the treatment and removal of Brazilian pepper from the uplands of the park and the leather fern marsh and needlerush marshes, reducing coverage of Brazilian pepper and other exotics to less than five percent within these habitats over the next two years. Annual budgeting for control of exotic vegetation has been approximately \$15,000.

Long term priorities for exotic vegetation management include the continued maintenance of exotics within the marsh and upland areas, along with progressive removal or treatment of exotics within the mangrove habitats.

5.1.2 Prescribed Burning

Although much of FMCEP is wetland habitat, prescribed fires remain an effective and efficient tool to mimic pre-development habitats. Prescribed burns effectively reduce fuel loads within natural habitats, which reduces the potential and intensity of accidental wildfires. Additionally, prescribed fires recycle nutrients back into the ground and stimulate some native plant seeds to germinate promoting increased biodiversity in the ground cover stratum. FMCEP has utilized prescribed fires to reduce fuel loads, control exotic vegetation, and increase biodiversity in the past and seeks to do so in the future.

The location of FMCEP require specific attention to ensure that traffic patterns on Veteran's Memorial Parkway to the south and residences to the west and north are not adversely affected.

The short-term priority for prescribed burning within FMCEP is to develop a prescribed burn plan within the next two years to be implemented as conditions and funding allow. The prescribed burn plan would be developed in accordance with F.S. Chapter 590 – Forest Protection with assistance from FFS.

Long-term goals of the prescribed burn plan are to conduct prescribed burns every 3 to 7 years in accordance with the approved prescribed burn plan to mimic a natural fire regime. The application of prescribed fire to FMCEP may require assistance from FFS or other certified prescribed burners.

5.1.3 Aquatic Habitat Restoration

Sea grasses provide habitat and forage for dozens of species of estuary fish, crustaceans, mollusks, waterfowl, and the endangered West Indian manatee and smalltooth sawfish. They also stabilize sediments and improve water quality and clarity. Sea grasses, specifically tape grass, were once found in dense stands along the tidally influenced portions of the Caloosahatchee River, and previous studies indicated that tapegrass beds were dense in the area of Four-Mile Cove. However, coverage of tape grass and other sea grasses has reduced by up to 2,000 acres since 2001.

Several projects have recently explored replanting tape grass in protective enclosures that protect the vegetation from herbivores, allowing the tapegrass to flower and reproduce. These projects have successfully reestablished tape grass in several areas and will continue to reintroduce tape grass to areas where salinity variations and herbivory previously reduced coverage of these beneficial aquatic species.

Replanting tapegrass within and near FMCEP would benefit water quality and clarity while offering enhanced habitat and forage for many species. Several entities including Lee County, SFWMD, the Charlotte Harbor National Estuary Program, Florida Sea Grant, Snook and Gamefish Foundation, Florida Gulf Coast University, the University of Florida Center for Aquatic Plants and others have joined together to reestablish tape grass in the Caloosahatchee River, and the City looks forward to collaborating with these entities to reintroduce tapegrass to the area around FMCEP.

5.1.4 Nuisance Animal Management

Control of nuisance and exotic animals is currently on an as needed basis. Nuisance animals including Nile monitors, green iguanas, spiny tailed iguanas and others could potentially colonize FMCEP. Any reports of exotic or nuisance animals occurring at FMCEP will be investigated by the City. Nuisance and exotic animals will be trapped by professional animal trappers or City staff as needed.

5.2 Public Access and Recreational Opportunities

The FMCEP currently offers environmental and ecological education and recreation opportunities comprised of walking paths and raised boardwalks meandering through mangrove and saltwater marsh habitats. Kayak rental and put-in facilities offer adventurers a safe place to rent and use a kayak to explore quiet natural creeks through the mangroves to the Caloosahatchee River. In addition to the environmental recreation opportunities, visitors and residents can explore several monuments honoring service men and women who have fought for this country. At this time, there are no plans to increase public access or recreational opportunities at FMCEP. However, additional monuments and attractions could potentially be funded through partnerships between the City and other community groups. Repair or replacement of boardwalk areas damaged by Hurricane Irma and repair or replacement of the floating docks within Four-Mile Cove that were damaged by Hurricane Irma will need to be addressed.

5.3 Archaeological and Historical Resource Protection

According to the Negative Project Area Letter from DHR, the Florida Master Site File lists no previously recorded cultural resources found near FMCEP. However, to ensure that archaeological and historical resources are protected during any future development activities, the City will contact the Compliance and Review Section of DHR for project review.

5.4 Facilities and Infrastructure

The FMCEP currently offers facilities and infrastructure that provide access to explore natural wetland communities and war memorials. The City hopes to improve the amenities of FMCEP by expanding the existing boardwalk and shell pathways to include a continuation of the lost pond loop boardwalk and a shell path trail beginning near the trailhead of the mangrove boardwalk meandering through upland areas on the north side of SE 24th Street toward the kayak rental facility on the western boundary of the property. Additionally, a new environmental center is proposed near the southwest corner of the property in an area that was previously cleared and filled that would allow additional environmental education opportunities for patrons of FMCEP. Finally, the City plans to add a boardwalk to provide access to one of the needlerush marshes to allow visitors to observe and learn about this rare southwest Florida habitat. The City also plans to update the kayak rental shack and has received or allocated \$45,000 toward this project.

Although no plans or appropriations have been made for these projects, the City proposes to initiate these improvements as opportunities arise.

The short-term priority projects for FMCEP include conducting feasibility studies for a new environmental center in the southwest corner of the property and shell pathway along the north side of SE 24th Street. Additionally, the repair and replacement of educational signage damaged by vandalism or natural causes, repair or replacement of boardwalk areas

damaged by Hurricane Irma, repair or replacement of the floating docks within Four-Mile Cove that were damaged by Hurricane Irma will need to be addressed.

Long-term infrastructure goals include conducting feasibility studies for the enhancement of the lost pond loop boardwalk, needlerush marsh boardwalk and extending the existing portage boardwalk. These enhancements will include unavoidable impacts to wetland areas and will require extensive permitting through appropriate agencies. The City is also interested in the installation of security cameras at the visitor center and parking areas and the construction of protective bollards around the existing memorials. These feasibility studies are proposed to be conducted within five – seven years.

5.5 Cooperative Management

The FMCEP offers unique opportunities for agencies, businesses, and organizations to combine resources and efforts to provide enhanced ecological education and recreational opportunities for the citizens of Cape Coral.

5.5.1 Seagrass

As stated above, the Caloosahatchee River has lost over 2,000 acres of freshwater tape grass. Four-Mile Cove once included dense stands of tape grass and scattered widgeongrass, providing habitat for numerous fish species. Restoration of tape grass meadows in the Caloosahatchee River and estuary has been identified as a priority by the State of Florida and the SFWMD. Collaboration between the City of Cape Coral and other agencies like Lee County, SFWMD, FDEP, Snook and Gamefish Foundation, Sanibel-Captiva Conservation Foundation and others could provide opportunities to increase the density of tape grass within Four Mile Cove and other creeks within FMCEP.

5.5.2 Fire

As stated above, the City plans on preparing a Prescribed Burn Plan for FMCEP. This detailed prescription for the application of prescribed fire to the preserves at FMCEP will help manage the preserve by decreasing fuel loads in the park, which reduces the potential for catastrophic wild fires in the future, recycles nutrients locked up in vegetative matter back into the soil, and increasing biodiversity in the ground cover stratum. However, the preparation of such a plan will likely require assistance from agency personnel with expertise in land management and prescribed burning. Agencies including the FFS, FDEP and concerned non-government organizations would assist greatly in the preparation of a successful prescribed burn plan.

5.5.3 Exotic Vegetation

Management of invasive exotic vegetation is the most pressing management requirement for FMCEP. Currently, the City conducts regular annual maintenance events. These exotic vegetation removal exercises are smaller in scale and cannot

address exotic vegetation throughout the preserve in any year. However, collaborations and funding between the City, FDEP, FGCU and local businesses to conduct park-wide exotic vegetation management activities would drastically reduce coverage of exotics in a short time frame. In addition to reduced vegetative coverage, a large-scale exotic removal effort would also reduce future seed sources and allow desirable species to increase coverage in the preserves. This would reduce long-term management costs associated with exotic vegetation control.

5.5.4 Veteran's Memorial Park

Cleaning, maintenance and expansion of the tributes and memorials found at Veteran's Memorial Park have been conducted by several community groups in the past. Namely, the City has collaborated with the Veteran's Midpoint Memorial Charitable Trust and others in the past to bring new exhibits to this memorial. Future collaborations between the City, VMMCT, Elks and Moose Lodges, VFW, American Legion, Scouts, local JROTC programs and others could continue to expand and refine the Veteran's Memorial Park.

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