

**APPENDIX F
RECREATION**

This page intentionally left blank.

TABLE OF CONTENTS

F.1	CEPP POST-AUTHORIZATION CHANGE REPORT.....	F-1
F.2	AUTHORIZATION	F-1
F.3	INTRODUCTION TO RECREATION FEATURES FOR THE CEPP PACR TSP	F-2
F.4	BENEFIT CATEGORIES.....	F-2
F.4.1	Study Area.....	F-2
F.4.2	Site A North High Embankment Boat Ramp	F-6
F.4.3	Site B Southeast Corner of A-2 Reservoir	F-9
F.4.4	Site C A-2 STA Public Access	F-9
F.4.5	Site D Southeast Corner of A-2 STA	F-11
F.4.6	CEPP Recreation Features.....	F-11
F.5	RECREATION BENEFITS	F-11
F.5.1	Determining Value Per Visit.....	F-11
F.5.2	Estimating Visitation	F-15
F.6	ECONOMIC JUSTIFICATION OF RECREATION	F-18
F.7	SENSITIVITY ANALYSIS.....	F-20
F.8	REFERENCES.....	F-20

LIST OF TABLES

Table F-1.	Site A North High Levee Boat Ramp Recreation Features.....	F-8
Table F-2.	Site B Southeast Corner of A-2 Reservoir Recreation Features	F-9
Table F-3.	Site C A-2 STA Public Access Recreation Features.....	F-10
Table F-4.	Site D Southwest Corner of A-2 STA Recreation Features	F-11
Table F-5.	Guidelines for Assigning Points for General Recreation	F-13
Table F-6.	Conversion of Points to Dollar Values	F-15
Table F-7.	Revised Potential Recreation Participation User Day Projection, CEPP PACR	F-17
Table F-8.	Summary of Recreation Costs and Annual Costs and Benefits	F-19
Table F-9.	Sensitivity Analysis using Multiple Scenarios	F-20

LIST OF FIGURES

Figure F-1.	A-2 Flow Equalization Basin Conceptual Recreation Plan, FWO, Authorized CEPP	F-3
Figure F-2.	Water Conservation Area 3A Conceptual Recreation Plan, FWO, Authorized CEPP	F-4
Figure F-3.	Water Conservation Area 3B Conceptual Recreation Plan, FWO, Authorized CEPP.....	F-4
Figure F-4.	Revised for the A-2 Reservoir and A-2 STA	F-5
Figure F-5.	Example Articulated Block Boat Ramp and Filled Corner.....	F-6

This page intentionally left blank.

APPENDIX F RECREATION

F.1 CEPP POST-AUTHORIZATION CHANGE REPORT

This appendix contains a description of the recreation conceptual plan that is being proposed for the Central Everglades Planning Project Post-Authorization Change Report (CEPP PACR). The CEPP recreation plan for the A-2 Flow Equalization Basin (FEB) was updated to reflect proposed recreation features with the CEPP PACR Tentatively Selected Plan (TSP). These changes to the recreation plan are limited to features at Site A and Site B within the study area. In order to crosswalk the authorized CEPP's recreation plan and the revised CEPP PACR plan, this appendix retains the description of the authorized CEPP recreation plan and inserts information about changes where appropriate. Similarly, costs are initially presented in Fiscal Year 2014 (FY14) price level for consistency with the published authorized plan. In Section F.6, costs are escalated to current FY18 price levels for calculation of the revised benefits and benefit-cost-ratio (BCR).

F.2 AUTHORIZATION

The Comprehensive Everglades Restoration Plan (CERP), authorized by the Water Resources Development Act of 2000 (WRDA 2000), would involve modifying the Central and Southern Florida (C&SF) Project, which was constructed with extensive Congressional authorizations from the 1944 Flood Control Act to the WRDA of 1996. The Federal Water Project Recreation Act (Public Law [P.L.] 89-72) and the WRDA of 1986 (P.L. 99-662) provide additional guidance. Further specific CERP design guidance was signed on May 12, 2000, in the form of the Department of the Army and South Florida Water Management District (SFWMD) Design Agreement for Everglades and South Florida Ecosystem Restoration Project.

Additional authorization and guidance for the proposed ancillary recreation resources development is contained in CECW-AG, 11 June 1998 Memorandum, Policy Guidance Letter No. 59, Recreation Development at Ecosystem Restoration Projects and EP 1165-2-502 (USACE 1999a). Despite austere budgets and policy requirements, recreational developments can and do contribute to community health and well-being (USACE 1998). The recreation resources that are being proposed as part of the TSP would comply with the philosophy and inclusion of the CESAD-PD-J 15 SEP 2004 Memorandum (USACE 2004). The plan is economically justified, and falls within the 10 percent rule, which requires that the Federal cost for the CEPP PACR including recreation not exceed 10 percent of the Federal project for the CEPP PACR excluding recreation (USACE 2000).

Additional supporting documentation for public access and recreational opportunities is found in the Presidential Memorandum - America's Great Outdoors, April 2010, and the subsequent report put out jointly by the major Federal land management agencies, America's Great Outdoors Report, February 2011 (U.S. 2011). The documents call for land managers to maintain or improve public access to government-owned lands and waters, and also to maintain or improve recreational opportunities on said lands and waters.

F.3 INTRODUCTION TO RECREATION FEATURES FOR THE CEPP PACR TSP

This appendix describes the conceptual plan that is being proposed for the TSP for recreation purposes. The revisions to the recreation plan as part of the CEPP PACR are concentrated at the portion of the CEPP study area on the A-1 and A-2 parcels, which are from this point forward referred to as the A-1 and A-2 sites. The TSP also includes the A-2 Expansion area.

Recreation features are being included in the CEPP PACR as an incidental project benefit. These recreation benefits are not used in the justification of the recommended plan. The SFWMD provided the conceptual recreation plan that identified facilities and their locations. Due to the incidental effect of the recreation elements, a determination of acceptable design to meet USACE standards has not been completed at this study phase. Recreation costs have been provided by the SFWMD. Including contingency, the revised estimated total construction cost for recreation for the CEPP (including the revised CEPP PACR features) is \$10.7 million (FY18 prices).

The CEPP PACR areas' enhanced wildlife watching, canoeing, hiking, horseback riding, bicycle riding, fishing, and hunting would attract users from all around the nation. The adjacent Stormwater Treatment Areas (STAs) and Wildlife Management Areas (WMAs) currently experience approximately 1 million visitors per year total, and visitors from all over the state and nation.

The proposed features of the TSP recreation plan would not require additional real estate. All features would be compatible with the environmental purposes of the project, and would not detract from the environment and may increase socioeconomic benefits being generated by the project. The activities that would be permitted in the project area (bicycle riding, horseback riding, nature study, wildlife viewing, walking/hiking, motor boating, canoeing/kayaking, sailing, fishing, and hunting) are all well-suited to the environmental purposes of the project. A major feature of the TSP would be approximately 31 miles of levee top trails which would loop around the proposed A-2 Reservoir and A-2 STA. The levee tops would provide many recreation activities to include Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) projected deficits, as well as National and State recreation trends as noted in the Central and Southern Florida Comprehensive Review Study (Yellow Book), 1999, as described below (State of Florida 2018; USACE 1999b).

This recreation appendix considers the planned structures with levees and strives to maintain existing access. The new structures envisioned accommodate public access across these features or provide a reasonable route to reach the same destinations. Where these structure types may change in the future designs, access across or a reasonable route would be maintained.

F.4 BENEFIT CATEGORIES

F.4.1 Study Area

The 2013 Florida SCORP is used as a resource for establishing activities of need to justify additional facilities. The 2013 SCORP has made a few changes since the authorized CEPP plan was developed. The SCORP in 2008 provided a specific facility need calculation, identifying the number of facilities needed in a region and the approximate number of people that might use a given size facility. The 2013 SCORP approaches establishing facility needs in a different manner. A survey of residents and tourists established

participation rates for specific activities. A facility need calculation was completed based on participation rates and an inventory of existing facilities. Each SCORP region is labeled as having above or below the average necessary facilities *or level of service*, by activity for the forecasted number of participants. The A-2 site, A-2 Expansion area, and A-1 FEB are in the SCORP Southeast Region that has lower than average facilities for trail uses, bank fishing, fresh water boat use, and nature study. However, the proposed A-2 STA (like the neighboring STAs) would draw waterfowl and alligator hunters from across Florida and beyond. The STAs are quota-only hunts and are extremely popular destinations. Approximately 99 miles of levee would provide access for biking, hiking, jogging, horseback riding, fishing, and nature study/wildlife viewing. An additional 122 miles would be designated blueways. National recreation trends of walking and paddle sports would also be accommodated.

The expected population growth of south Florida would only add to the projected existing recreation deficits. However, regional population figures and future population estimates were not factored into this analysis because of the uncertainty associated with these forecasts and a desire to present a conservative analysis. The proposed ancillary recreation resources study area is within the project study area on CERP lands, in Palm Beach County, Florida, west of U.S. Highway (US) 27 in the Everglades Agricultural Area (EAA) and in WCA-3 (See **Figure F-1, Figure F-2, and Figure F-3**). **Figure F-4** illustrates the changes to the authorized CEPP features that are proposed for the A-2 site and A-2 Expansion area, which includes changes at recreation sites A and C. Recreation Site D is unchanged and would be a part of the A-2 site and A-2 Expansion area. Recreation site B was incorporated into the construction of the A-1 FEB. The southern CEPP recreation sites, E through J, remain the same as in the authorized CEPP plan.

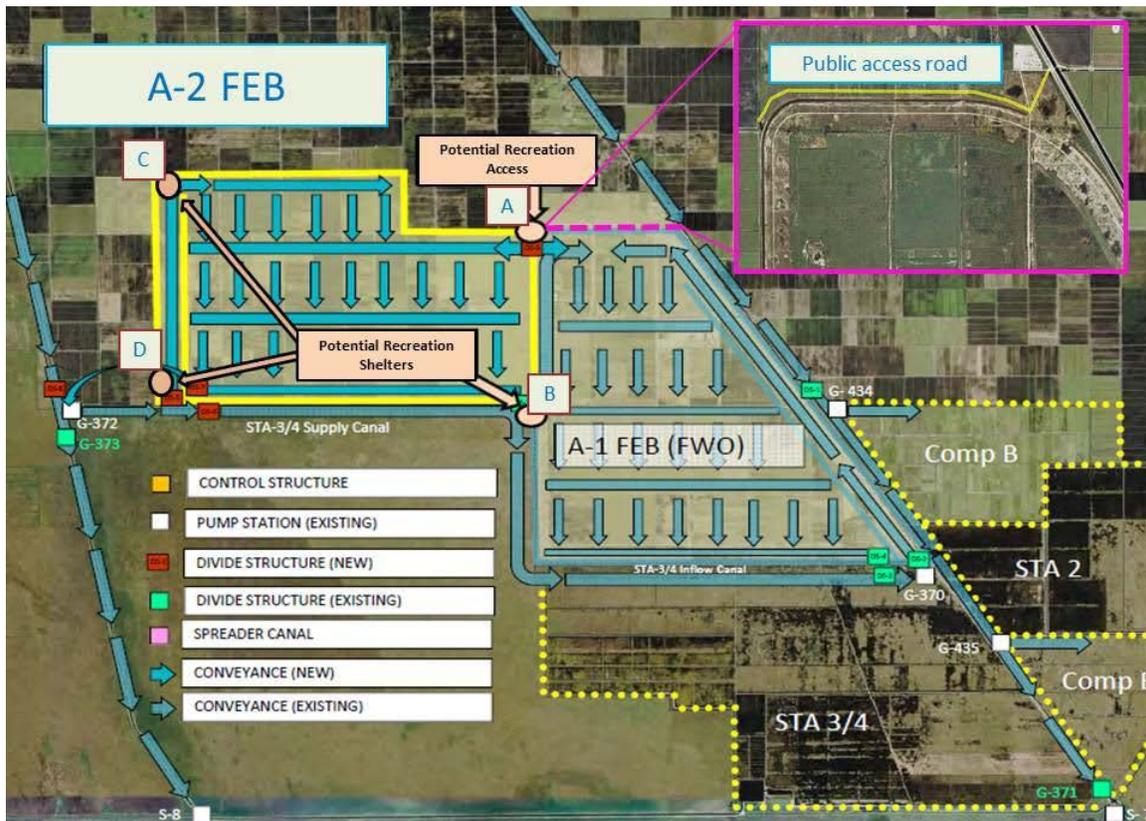


Figure F-1. A-2 Flow Equalization Basin Conceptual Recreation Plan, FWO, Authorized CEPP



Figure F-2. Water Conservation Area 3A Conceptual Recreation Plan, FWO, Authorized CEPP



Figure F-3. Water Conservation Area 3B Conceptual Recreation Plan, FWO, Authorized CEPP



Note Site X, this is an existing public access site for the A-1 FEB, not identified earlier as part of CEPP.

Figure F-4. Revised for the A-2 Reservoir and A-2 STA

The CEPP PACR recreation plan focuses on revisions to the CEPP recreation plan at the A-2 site and the A-2 Expansion area.

The A-2 Reservoir site would have a boat ramp for power boats to enter the reservoir. The boat ramp would also be used by SFWMD staff for maintenance, monitoring, adaptive management, and other purposes. The ramp would be accessed by a vehicle ramp up and over the levee with sufficient parking atop the reservoir area. Parking atop the levee minimizes travel between the parking lot and the boat ramp, which provides for the most functional and efficient launch facility. Additional parking outside the levee may be considered in the future as part of an adaptive management strategy if a need is identified.

The recreation planning for the A-2 STA and A-2 Reservoir would incorporate an adaptive management strategy to address the uncertainty regarding what vegetation would occur within the cells. The project would also, as much as feasible, provide for blueways and greenways to circulate on the project levees, canals, and form interconnections between adjacent lands. The actual program of activities would be dependent on the resulting vegetation and how the activities would affect the project purposes.

The types of vegetation that occur within the cells would influence the types of wildlife, both of which affect the types and quality of nature-based recreational activities available to the public. The recreation plan seeks to anticipate and acknowledge this uncertainty in the development of the plan.

One such uncertainty is the presence of emergent vegetation in the cells. If emergent vegetation is heavy and monocultural, wildlife presence may be negatively affected, reducing the quality of some recreation activities at the site. Heavy monocultural emergent vegetation may also negatively affect flow within the cells. The ideal vegetation condition for the recreation plan would be a blend of emergent and submerged vegetation, which tends to draw the types of wildlife that interest those members of the public desiring

to hunt, fish, and/or view wildlife. Efforts to control vegetation may change or not be completely accomplished. Experience has shown that even where a monoculture of emergent vegetation is desired for project purposes, it is not always accomplished due to many factors, such as fluctuations in water levels resulting from long wet or dry hydroperiods. Therefore, the recreation facilities would be developed in anticipation of this uncertainty.

It is expected that implementation of the recreation plan would occur in coordination with the overall project design to maximize efficiency of earthworks and other processes that are required for both the TSP and the recreation plan features. For example, construction staging areas and equipment ramps may be planned such that those areas are retained used for construction of recreation plan features. Additionally, some features of the recreation plan may be dual use. For example, the boat ramp designed for recreation may also satisfy the need for access to the reservoir for levee or reservoir maintenance activities. This approach to design efficiency has been successfully applied in other restoration projects.

The A-2 Reservoir boat ramp may be of articulated block construction or a solid concrete ramp (**Figure F-5**). Additional parking areas for the public could be expanded outside the levees as necessary to accommodate demand. An interim and cost-effective approach to meeting parking demand would be filled-in corners at certain key levee intersections and elongated turnouts. These features have been successfully applied on past local projects and are commonly used for construction and maintenance purposes later.

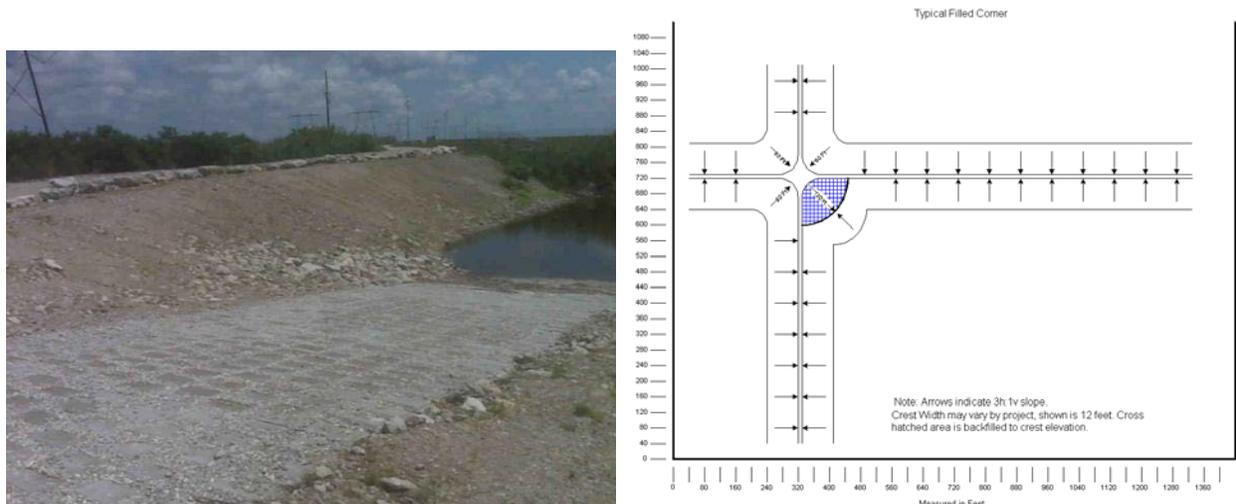


Figure F-5. Example Articulated Block Boat Ramp and Filled Corner

F.4.2 Site A North High Embankment Boat Ramp

As noted in the introduction, Site A is the site where the CEPP PACR recreation plan includes revisions to the authorized CEPP recreation plan. In the CEPP, Site A included an articulated block boat ramp, and in the CEPP PACR recreation plan, Site A includes a boat ramp facility with ramps over a high embankment where a solid concrete ramp is anticipated.

In the revised plan, Site A is the point of access to the A-2 Reservoir for the public and SFWMD staff. An existing transition lane off of US 27 would provide access to this site. A 24-foot-wide, two-lane gravel road from US 27 to the recreation facility is required. A vehicle bridge with pedestrian walkway and access

ramps up the high levee would provide access for vehicles with boat trailers to a boat ramp facility within the levee area of the reservoir. If it is determined that a separator dam is required to divide the reservoir, this boat ramp facility location would be relocated to the separator dam and designed as a single facility, offering one boat ramp into each cell. The boat ramps themselves have a high curb to prevent vehicles from venturing onto the levee slopes. The boat ramp facility also acts as a trailhead, providing parking at crest elevation for single vehicles. The perimeter of the parking area would have some means (e.g., guard rail, high curb, or wave wall) to inhibit vehicles from accessing the levee side slopes. The parking surface may be articulated block, and entrances to the top of levees would be controlled by standard vehicle gates and pedestrian pass-throughs. Other recreation features include a pre-poured concrete dual gender vault toilet, bike racks, and an information kiosk with rules and interpretive signage. An area outside the leveed area should be identified that may in the future serve for the development of additional parking.

Project designs should not inhibit public access to circumnavigate the reservoir levees as pedestrians. Structures and pumps would incorporate pedestrian bypass routes as much as feasible. The recreation program would control access. The SFWMD owns fee title to this site. Costs are shown in **Table F-1**.

Table F-1. Site A North High Levee Boat Ramp Recreation Features

Site A Features	Authorized CEPP Recreation Plan			Revised CEPP PACR Recreation Plan		
	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
Vehicle / Pedestrian Gate	3	\$5,000	\$15,000	3	\$5,000	\$15,000
Signs	1	\$2,000	\$2,000	1	\$2,000	\$2,000
Roofed Sign Boards 4'x4'	1	\$4,000	\$4,000	1	\$4,000	\$4,000
Picnic Tables	4	\$500	\$2,000	4	\$500	\$2,000
Bike Rack	1	\$1,000	\$1,000	1	\$1,000	\$1,000
Group Shelter 16'x24'	1	\$30,000	\$30,000	1	\$30,000	\$30,000
Vault Toilet, 2 gender	1	\$40,000	\$40,000	1	\$40,000	\$40,000
Additional Fill Shelter (cubic yards)	225	\$20	\$4,500	225	\$20	\$4,500
Improved Vehicle Access Road (Shell Rock/Gravel) 2.25 miles 25'x2'x11,880 = 22,000 cubic yards	22,000	\$20	\$440,000	22,000	\$20	\$440,000
Improved Parking Area (1550'x90'x4 = 765 cubic yards)	765	\$20	\$15,300	765	\$20	\$15,300
Guard Rails	200	\$200	\$40,000	200	\$200	\$40,000
Split Rail Fence	100	\$15	\$1,500	-	-	-
Post and Board Fence	-	-	-	100	\$25	\$2,500
ADA Fishing Platform	1	\$50,000	\$50,000	1	\$50,000	\$50,000
Boat Ramp	1	\$100,000	\$100,000	1	\$1,500,000	\$1,500,000
Table Summary			\$820,300			\$2,221,300

F.4.3 Site B Southeast Corner of A-2 Reservoir

Site B was built as a part of the A-1 FEB, and revision at the site are the same as proposed in the authorized CEPP. It was originally intended to serve as a trail shelter between both FEBs. Where it is located would coordinate well in the CEPP PACR recreation vision between the A-1 FEB and the A-2 Reservoir. This site is built on a low levee; it is a small gravel area yet to have an information kiosk, bike racks, and picnic tables. This area would offer shelter from weather and a resting place. The SFWMD owns fee title to this site. As built, it includes a staff boat ramp available for public use. Costs are shown in **Table F-2**.

Table F-2. Site B Southeast Corner of A-2 Reservoir Recreation Features

Site B Features	Quantity	Unit Cost	Total Cost
4'x4' Sign	1	\$4,000	\$4,000
Picnic Tables	1	\$500	\$500
Bike Rack	1	\$1,000	\$1,000
Kiosk Shelter 12'x16'	1	\$20,000	\$20,000
Additional Fill Shelter (cubic yards)	225	\$20	\$4,500
Table Summary			\$30,000

F.4.4 Site C A-2 STA Public Access

Site C is the second site which includes changes to the recreation features as part of the CEPP PACR recreation plan. In the authorized CEPP, Site C included a basic public access point; in the CEPP PACR recreation plan, Site C includes additional amenities at the access point such as a restroom and additional picnic tables and access gates. Access to Site C would be by public vehicles along a project levee or by bike via other project levees. Where adjacent to a high embankment, a sloped access ramp would allow pedestrian and bike access from one to the other project. At the A-2 STA site, there would be a small parking area sufficient for ADA parking, with information kiosk, and toilet at crest elevation; the remainder of parking may be below crest elevation. STAs commonly host hunting and bird watching programs and may have 100 vehicles and several hundred individuals present on those days. During these events, participants drive on the levees, so the parking lot should be long and narrow to accommodate vehicles in line and for traffic to circulate in and out of entrance gates. Interior levees may need vehicle gates where adjacent to high levees not accessed by public vehicles. Costs are shown in **Table F-3**.

Table F-3. Site C A-2 STA Public Access Recreation Features

Site C Features	Authorized CEPP Recreation Plan			Revised CEPP PACR Recreation Plan		
	Quantity	Unit Cost	Total Cost	Quantity	Unit Cost	Total Cost
4'x4' Roofed Sign Board	1	\$4,000	\$4,000	1	\$4,000	\$4,000
Picnic Tables	1	\$500	\$500	4	\$500	\$2,000
Bike Rack	1	\$1,000	\$1,000	1	\$1,000	\$1,000
Kiosk Shelter 12'x16'	1	\$20,000	\$20,000	1	\$20,000	\$20,000
Additional Fill Shelter (cubic yards)	225	\$20	\$4,500	225	\$20	\$4,500
Additional parking fill for parking lot (100 x700 ft) (cubic yards)	-	-	-	5,185	\$20	\$103,700
Toilet	-	-	-	1	\$40,000	\$40,000
Post and Board fence, feet	-	-	-	200	\$25	\$5,000
Signs	-	-	-	1	\$2000	\$2000
Vehicle/ Pedestrian Gate	-	-	-	5	\$5,000	\$25,000
Table Summary			\$30,000			\$207,200

F.4.5 Site D Southeast Corner of A-2 STA

There are no changes in the recreation plan features for Site D originally included in the CEPP plan and still proposed in the CEPP PACR recreation plans. Access to Site D would be by boat or by hiking or biking on the embankment. This site would be much more primitive than the A-2 STA or A-2 Reservoir sites, containing only a filled corner for a trail rest area with a kiosk shelter and bike racks, on a small gravel area. The SFWMD owns fee title to this site. Costs are shown in **Table F-4**.

Table F-4. Site D Southwest Corner of A-2 STA Recreation Features

Site D Features	Quantity	Unit Cost	Total Cost
4'x4' Sign	1	\$4,000	\$4,000
Picnic Tables	1	\$500	\$500
Bike Rack	1	\$1,000	\$1,000
Kiosk Shelter 12'x16'	1	\$20,000	\$20,000
Additional Fill Shelter (cubic yards)	225	\$20	\$4,500
Table Summary			\$30,000

F.4.6 CEPP Recreation Features

Recreation plans for Sites E through J, as presented in the CEPP PIR would not change for the CEPP PACR TSP. Additional details about the recreation features for CEPP can be found in the CEPP PIR (Appendix F).

F.5 RECREATION BENEFITS

The national economic development (NED) benefit evaluation procedures contained in ER 1105-2-100 (USACE 2000), Appendix E Section VII, include three methods of evaluating the beneficial and adverse NED effects of project recreation: travel cost method (TCM), contingent valuation method (CVM), and unit day value (UDV) method.

The unit day value (UDV) method was selected for estimating recreation benefits associated with the creation of the CEPP. The UDV approach in recreation benefit analysis consists of two parts: determining value per visit and estimating visitation.

F.5.1 Determining Value Per Visit

When the UDV method is used for economic evaluations, planners will select a specific value from the range of values provided annually. Application of the selected value to estimate annual use over the project life, in the context of the with-project and FWO project framework of analysis, provides the estimate of recreation benefits.

The FWO project condition in the EAA portion of this analysis has no recreation value because the EAA would not be open to the public. It is presumed that the A-2 Reservoir and A-2 STA must be opened to the public in order to realize the recreation benefits being claimed. The FWO project condition for the areas outside of the EAA portion currently offers recreational opportunities. To capture additional recreation benefits from this project area, the existing visitation must be subtracted from the projected

visitation claimed by the additional proposed recreation features. The with-project will be the expected value of the recreational activity based on the UDV method.

Table F-5 illustrates the method of assigning a point rating to a particular activity. The table also shows the point values assigned based on measurement standards described for the five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity, Accessibility, and Environmental.

Table F-5 includes the scores for both the authorized CEPP and the revised CEPP PACR to reflect the changes in the recreation features associated with the CEPP PACR. As highlighted in the table, scores were revised for the Recreation Experience and the Availability of Opportunity criteria. Rationale for point assignment is discussed after the table.

Table F-5. Guidelines for Assigning Points for General Recreation

General Recreation Scoring Criteria						Authorized CEPP Score	CEPP PACR Revised Score
Criteria	Judgment Factors						
Recreation Experience	Two general activities	Several general activities	Several general activities: one high quality value activity	Several general activities; more than one high quality activity	Numerous high quality value activities; some general activities	10	18
	0-4	5-10	11-16	17-23	24-30		
Availability of Opportunity	Several within 1 hr. travel time; a few within 30 min. travel time	Several within 1 hr. travel time; none within 30 min travel time	One or two within 1 hr. travel time; none within 45 min. travel time	None within 1 hr. travel time	None within 2 hr. travel time	3	8
	0-3	4-6	7-10	11-14	15-18		
Carrying Capacity	Minimum facility for development for public health and safety	Basic facility to conduct activity(ies)	Adequate facilities to conduct without deterioration of the resource or activity experience	Optimum facilities to conduct activity at site potential	Ultimate facilities to achieve intent of selected activities	8	8
	0-2	3-5	6-8	9-11	12-14		
Accessibility	Limited access by any means to site or within site	Fair access, poor quality roads to site; limited access within site	Fair access, fair road to site; fair access, good roads within site	Good access, good roads to site; fair access, good roads within site	Good access, high standard road to site; good access within site	15	15
	0-3	4-6	7-10	11-14	15-18		
Environmental	Low aesthetic factors that significantly lower quality	Average aesthetic quality; factors exist that lower quality to minor degree	Above average aesthetic quality; any limiting factors can be reasonably rectified	High aesthetic quality; no factors exist that lower quality	Outstanding aesthetic quality; no factors exist that lower quality	10	10
	0-2	3-6	7-10	11-15	16-20		
Total Points						46	59

Point value assignments for **Table F-5** are based on Economic Guidance Memorandum (EGM) 18-03 (USACE 2017b). The Criteria and Judgment Factors for General Recreation were specifically used as the basis of the estimated point values for the proposed recreation area. Judgment factors were based on site visits and coordination with local agencies. The following selection factors were used for the criteria outlined in **Table F-5**.

The proposed CEPP PACR recreation plan would include opportunity for at least two regionally unique high-quality activities, including elevated viewing areas on top of the reservoir levees and the opportunity for freshwater sailing on the reservoir. The CEPP PACR site offers solitude and panoramic views in a growing metropolitan region, and would provide specific recreation amenities (as outlined in **Table F-1** through **Table F-4**) for expanding local populations and increasing recreation demands. The environmental restoration component (water storage and release) could help to provide an increase of quality freshwater boat and bank fishing for the region on project lands. Boat launching ramps, shelters with benches, and multi-purpose trail experiences would be enhanced by panoramic views and wildlife viewing opportunities. The proposed recreation sites would provide several general recreation activities and more than one high-value activity.

The availability of opportunity rating is based upon current local recreation facilities near the project area in the proposed recreation resource location. A 25-mile radius around the proposed project area represents a fairly dense urban population to the east. A 50-mile radius would include more of the EAA and a couple of other wildlife management areas, regional parks, and greenways with similar resources and a much larger urban setting to the East. The proposed multi-use trail, freshwater bank fishing, boat launch, and shelters and benches would provide unique opportunities in the proposed water management areas. The proposed recreation resources would help to provide facilities for current and projected statewide Treasure Coast and South Florida Region deficits. Given the CEPP PACR revisions to the recreation plan described at recreation Site A and Site B, including rare elevated viewpoints and freshwater sailing opportunities, the relative uniqueness of the recreation available at the project is increased compared to the authorized CEPP. As such, the score was revised to reflect that there may be similar recreation opportunities available within a one or two hour travel time, but none within 45 minutes travel time.

The proposed recreation resource carrying capacity values are based on the optimum use of the site potential, without overuse of the proposed recreation resources. Good water resources and access to them for boat and non-boat fishing, multi-use trail and environmental observation comprise a balanced use of the proposed recreation resource use. Adequate facilities would be constructed to conduct these activities without deteriorating the resource or activity experience. Peak use is expected to occur during half of the calendar year.

The accessibility rating is based upon the availability of the local highways, roads and streets in good condition that would provide access to the proposed recreation facilities. Existing access off of US 27, Interstate 75, and US 41 would provide good access to these sites. The levees would provide approximately 99 miles of good multi-use trail access on the project sites. Area canals would also provide 122 miles of blueways from these sites.

The environmental quality rating is based upon the existing natural resources and aesthetic quality of the proposed project area. The proposed site of the reservoir and STA possesses poor aesthetic resources, which would be dramatically improved with project construction. These areas would provide panoramic

views of open water and Everglades-type landscape features. The best aesthetics of the proposed project areas are of views from the levee out vast expanses of open water and over these areas to the east and south. Views from the levees to the north and west would be of the agricultural lands currently in sugarcane production.

The value of a day of general recreation at the proposed recreation sites for the CEPP PACR was determined using the guidelines for Assigning Points for the General Recreation in **Table F-5**. The points were then converted to dollar values using conversion factors included in the EGM 18-03, Unit Day Values for Recreation, 2018, which is based on ER 1105-2-100. **Table F-6** was used to convert points to a UDV FY2018 dollar amount. Using linear interpolation, the total point value for the recreation sites, including revised features as part of the CEPP PACR, was determined to be 59. The user day value conversion equivalent is \$9.29.

Table F-6. Conversion of Points to Dollar Values

Point Values	General Recreation Values
0	\$4.05
10	\$4.81
20	\$5.32
30	\$6.08
40	\$7.59
50	\$8.61
60	\$9.37
70	\$9.87
80	\$10.89
90	\$11.64
100	\$12.15

F.5.2 Estimating Visitation

SCORP was determined to be the best available resource for estimating recreation usage capacity. The State of Florida's Department of Environmental Protection's Division of Recreation and Parks coordinated and developed the SCORP for 2008 and subsequently published an update in 2013. As noted in **Section F.4.1**, the SCORP methodology was revised between the 2008 and 2013 versions, and the published 2008 capacity guidelines remain the best available information for the study area. The 2013 SCORP provided Level of Service data that reiterated the recreation needs within the region. This information was used to derive and project total recreation participation and allocate the participation from State to regional levels. The SCORP guidelines for resource-based outdoor recreation activities are listed in **Table F-7**. These guidelines are based on maximum levels of carrying capacity developed by the Division of Recreation and Parks for use and protection of state park resources.

Table F-7 shows the visitation projections for the revised CEPP PACR recreation plan at the A-1 FEB, A-2 Reservoir, and A-2 STA sites. The A-2 Reservoir and A-2 STA included in the CEPP PACR recreation plan would be a large inland body of freshwater in an area of the State where State-based recreation resources are mainly coastal and saltwater based.

Based on the SCORP forecast for unmet recreation needs for the year 2015, the study region has unmet recreation demand that aligns with several activities that would be available under the proposed

recreation plan (bicycling, hiking, and non-boat freshwater fishing). While unmet demand would likely continue to increase (the population is projected to almost double in coming decades), user rates for economic justification purposes were conservatively calculated using the capacity projection for 2015. Due to the CEPP's relatively rural location and rustic/minimal recreation features proposed, it was determined that an extremely conservative usage rate would be projected. The projected usage rates follow the resource needs and guidelines published by the SCORP, but in every case rates were estimated to be lower than the SCORPs published rates. It is also anticipated that the water-based recreation opportunities could be reduced during the dry periods, and only several miles on either side of access points would be utilized to their potential. This is the most practical scenario for justifying the proposed recreation features for the CEPP.

The use guidelines designated for biking, hiking, and nature study trails were based on carrying capacity guidelines adopted by the SCORP and used by the State park system. The bicycle trail use guidelines are 40 to 80 users per mile per day, assuming 10 to 20 riders per mile per day with a daily turnover rate of 4. The use guideline for hiking trails is 4 to 20 hikers per mile per day with a daily turnover rate of 4. The CEPP PACR includes approximately 99 miles of proposed levee top multi-purpose trails available for use. A conservative approach was used for the purpose of usage projections. Only 75 miles of the 99 total miles were used to determine daily user rates, because of combined distances to points of interest from each trailhead. These areas would be the most utilized. This approach underestimates the potential daily usage rate, but was determined to be the most likely scenario.

Additionally, the Outdoor Recreation Coalition of America (ARC) notes the trend in walking, bird watching, and primitive camping increased 42 percent, 155 percent, and 58 percent, respectively, from the 1984 survey to the 1995 survey. The U.S. Fish and Wildlife Service, National Survey of Fishing, Hunting and Wildlife-Associated Recreation shows a 98 percent and 38 percent increase of residential and non-residential wildlife watching, respectively, in the State of Florida (Yellow Book 1999).

It is assumed that 10 linear feet of the A-2 Reservoir or A-2 STA shoreline is required for each person fishing at any given time. It is assumed that this space would be used twice per day and therefore the use guideline was established at 5 linear feet per person per day. It is assumed that bank fishing would be most popular adjacent to the TSP pump stations and gated structures. It is also assumed bank fishing would occur up to a $\frac{1}{4}$ mile away from the structures on either side. Four structures are relatively close to the trailheads totaling 2 miles (10,560 linear feet) of bank fishing associated with the revised CEPP PACR recreation plan for benefit estimation purposes.

The SCORP Projections for the Treasure Coast and Southern Regions show minimal projected shortage of horseback riding and/or nature study in the region. These activities are planned in the reservoir and the STA Recreation Proposal because they are compatible activities and are anticipated to have greater state deficits as the population nearly doubles by the year 2050. With ensuing development in the immediate area and region, and the increase in population projections for the State of Florida, it is expected that there would be ample use of the proposed recreation facilities and fully expects a continued shortage in some of the existing activities in this area throughout the planning period.

Table F-7. Revised Potential Recreation Participation User Day Projection, CEPP PACR

Activity	Projected Users per Day	Units Provided	Maximum Area Requirement ²	Turnover Rates ²	Guidelines ²	Regional Need ¹
						SCORP Level of Service
Multi-use Trail (Biking/Hiking/Equestrian)	38/38/38	50 miles	10-20 per mile	4 per day	40-80 users per mile per day	0.10, 0.12, 0.19
Boating (Non-Motorized & Motorized) Fresh Water Boat Ramp Use	63	50 mi canals; 37 square miles of reservoir	1-2 users per boat	2 per day	1-2 boats per square mile	0.18
Nature Study	25	50 miles	5-20 groups per mile	4 per day	40-160 users per mile per day	0.09
Non Boat fishing	40	21,120 linear feet; 4 structures 1/4 mile on each side of access point	10 linear feet of bank per person	2 per day	5 linear feet of bank per user per day	49.56
Hunting Waterfowl/Alligator	14/2	Waterfowl and Alligator hunting need and user day based on offering same hunt opportunities as 4 neighboring STAs that have demonstrated high demands for same hunt format. Total number of hunters for each species season has been divided by 365 days. ³				
General Recreation Total	258					

¹ SCORP Methods of calculating need changed from 2008, to 2013. These 2013, Levels of Service averages, are below the state average, demonstrating need.

² SCORP 2008 columns, Max Area Requirements, Turnover Rates, and Guidelines, remain in table for comparison purposes to CEPP south.

³ SCORP Regional analyses do not recognize the STA state needs served.

F.6 ECONOMIC JUSTIFICATION OF RECREATION

The justification for incurring additional costs for recreation features is derived by utilizing a benefit to cost ratio. The tangible economic justification of the proposed ancillary recreation project component can be determined by comparing the equivalent average annual charges (facility costs) against the estimate of the equivalent average annual benefits, which would be realized over the period of analysis (project lifespan). These average annual recreation benefits and costs are summarized in **Table F-8**.

The USACE's ER 1105-2-100 (Planning Guidance Notebook) provides economic evaluation procedures to be used in all Federal water resources planning studies. The guidelines specified in the regulation were observed in preparing this cost analysis.

Costs presented to this point have maintained the FY14 price level used in the authorized CEPP recreation plan. To facilitate comparison of the authorized CEPP recreation plan and the revised plan under the CEPP PACR, **Table F-8** shows costs at an FY14 price level first, and then escalates costs to current FY18 prices prior to calculation of the updated net benefits and benefit-to-cost ratio.

Costs were escalated to FY18 price level based upon the USACE Civil Works Construction Cost Index System index for Recreation Facilities (EM 1110-2-1304 [USACE 2017a]). Additionally, the revised benefit analysis utilizes the Federally mandated project evaluation interest rate of 2.75 percent for FY18 and an economic period of analysis of 50 years. Other cost assumptions were kept consistent with the authorized CEPP recreation plan, including:

- OMRR&R remains unchanged.
- Length of the construction period was kept the same (3 years) for the purposes of calculating interest during construction (IDC).
- Markup for PED, S&A, and EDC was set at 31 percent.
- A contingency of 43 percent was applied.

This analysis leads to the conclusion that given escalated costs and the updated interest rate, the authorized CEPP recreation plan would have benefits equal to 1.89 times its costs, with net annual benefits of \$282,000. Furthermore, implementation of the proposed revisions to the recreation plan as part of the CEPP PACR would increase the ratio of benefits to costs, with benefits equal to 2.57 times the plan costs, and net annual benefits of \$776,700. The costs and benefits associated with this Recreation Plan have been preliminarily estimated.

Table F-8. Summary of Recreation Costs and Annual Costs and Benefits

Site	Authorized CEPP Plan	CEPP PACR Plan
Detailed Costs, \$FY14²		
Site A	\$820,000	\$2,221,000
Site B	\$30,000	\$30,000
Site C	\$30,000	\$207,000
Site D	\$30,000	\$30,000
Site E	\$305,000	\$306,000
Site F	\$790,000	\$791,000
Site G	\$935,500	\$936,000
Site H	\$35,000	\$35,000
Site I	\$357,000	\$357,000
Site J	\$75,000	\$75,000
Subtotal All Sites¹	\$3,410,000	\$4,987,000
PED, S&A, and EDC (31%) ²	\$1,070,000	\$1,546,000
Contingency (43%) ²	\$1,930,000	\$2,809,000
Total Construction Cost	\$6,400,000	\$9,342,000
IDC (3.5%) ⁵	\$330,000	\$379,700
Total Investment	\$6,730,000	\$9,722,000
Amortized (3.5%) ⁵	\$287,000	\$360,100
OMRR&R	\$68,000	\$68,000
Average Annual Cost	\$355,000	\$428,100
Summary of Escalated Costs, \$FY18³		
Total Construction Cost	\$6,669,000	\$9,756,000
IDC (2.75%) ⁵	\$271,000	\$396,500
Total Investment	\$6,940,000	\$10,153,000
Amortized (2.75%) ⁵	\$257,100	\$376,100
OMRR&R	\$61,700	\$61,700
Average Annual Cost	\$318,800	\$437,800
Summary of Annual Benefits, \$FY18		
General Recreation		
Unit Day Value ⁴	\$8.20	\$9.29
Daily Use	200	358
Annual Use (x 365 days)	73,000	130,670
Average Annual Benefit	\$598,700	\$1,214,400
Benefit to Cost	1.88	2.77
Net Annual Benefits	\$280,000	\$776,700

¹ Cost includes one-time fill costs.

² Consistent with CEPP Final PIR and EIS, Appendix F, July 2014

³ Escalation Factor = 1.0443; EM 1110-2-1304 (Sept 2017); Q1 FY14 to Q2 FY18, feature code 'Recreation Facilities'

⁴ Unit Day Values reflect FY18 guidance (EGM 18-03, Unit Day Values for Recreation)

⁵ CEPP Final PIR and EIS, Appendix F (July 2014) utilized FY14 interest rate. Escalated costs use current FY18 rate.

F.7 SENSITIVITY ANALYSIS

A sensitivity analysis was conducted for the CEPP PACR recreation plan to further reinforce expected benefits and provide extra support for the justification of recreation features. **Table F-9** includes a sensitivity analysis that contains the expected average annual benefits from the **Table F-8** a worst-case scenario depicting the number of annual visitors required for benefits to equal costs, and a scenario in which the SCORP guidelines are utilized as they are presented. As can be noted from this sensitivity analysis, a minimum average rate of 129 users per day would be required to justify the proposed costs for recreation. Taking a conservative 20 percent of the SCORP minimum guidelines, expected benefits could be as high as \$17.5 million per year.

Table F-9. Sensitivity Analysis using Multiple Scenarios

Scenario	Annual Users	Average Daily Users	Annual Benefit
Worst-Case Scenario to Cover Annual Cost	47,106	129	\$437,800
Projected Scenario	130,670	358	\$1,214,400
SCORP at 20%	1,879,020	5,148	\$17,464,000

F.8 REFERENCES

Public Law 106-541. WRDA, Water Resources Development Act of 2000.

<https://www.gpo.gov/fdsys/pkg/PLAW-106publ541/content-detail.html>.

Public Law 89-72. Federal Water Project Recreation Act of 1965 (P.L. 89-72; 79 Stat. 213, 214; 16 USC 460l et seq.), as amended. <https://www.gpo.gov/fdsys/pkg/STATUTE-79/pdf/STATUTE-79-Pg213.pdf>

Public Law 99-662. WRDA, Water Resources Development Act of 1986, as amended.

<https://www.gpo.gov/fdsys/pkg/STATUTE-100/pdf/STATUTE-100-Pg4082.pdf>

State of Florida. 2018. Statewide Comprehensive Outdoor Recreation Plan (SCORP), 2008 and 2013 reports. <https://floridadep.gov/parks/florida-scorp-outdoor-recreation-florida>

U.S. 2010-2011. America's Great Outdoors Initiative. Presidential Memorandum and Progress Report.

<https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/ago>

USACE (U.S. Army Corps of Engineers). 1998. Policy Guidance Letter No. 59, Recreation Development at Ecosystem Restoration Projects. 11 June. CECW-AG, Memorandum for Major Subordinate Commands and District Commands.

<http://www.usace.army.mil/Portals/2/docs/civilworks/pgls/pgl59a.pdf>

USACE. 1999a. Engineer Pamphlet 1165-2-502, Water Resources Policies and Authorities, Ecosystem Restoration – Supporting Policy Information. 30 Sept. CECW-A.

http://www.publications.usace.army.mil/Portals/76/Publications/EngineerPamphlets/EP_1165-2-502.pdf

USACE. 1999b. Central and Southern Florida Comprehensive Review Study (Yellow Book). April.
http://141.232.10.32/pub/restudy_eis.aspx#p7HGMpc_1_1

USACE. 2000. Engineer Regulation 1105-2-100, Planning, Planning Guidance Notebook. April 22. CECW-P.
http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1105-2-100.pdf

USACE. 2004. Multi-Purpose Project Memorandum. CESAD-PDD-J. Atlanta, GA (15 Sep. 2004).

USACE. 2014. Comprehensive Everglades Restoration Plan Central Everglades Planning Project Final Integrated Project Implementation Report and Environmental Impact Statement. Jacksonville District, Jacksonville, Florida, USA.

USACE. 2017a. Engineering Manual 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS), Amendment #1. 30 Sept. CECW-EC, Engineering and Design Manual.
http://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1304.pdf

USACE. 2017b. Economic Guidance Memorandum 18-03, Unit Day Values for Recreation, Fiscal Year 2018. Memorandum for Planning Community of Practice. October. CECW-P.
<https://planning.erdc.dren.mil/toolbox/library/EGMs/EGM18-03.pdf>

This page intentionally left blank.