

COMPREHENSIVE EVERGLADES RESTORATION PLAN
LAKE OKEECHOBEE WATERSHED
RESTORATION PROJECT
REVISED DRAFT INTEGRATED PROJECT
IMPLEMENTATION REPORT
AND ENVIRONMENTAL
IMPACT STATEMENT



July 2019



Appendix F

**APPENDIX F
RECREATION**

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F RECREATION PLAN

This appendix outlines the proposed recreation plan.

F.1 AUTHORIZATION

The CERP, authorized by WRDA 2000, will involve modifying the C&SF project, which was constructed with extensive congressional authorizations from the 1944 Flood Control Act to the Water Resources Development Act of 1996. The Federal Water Project Recreation Act (P.L. 89-72) and the Water Resources Development Act 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 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. Despite austere budgets and policy requirements, recreational developments can and do contribute to community health and wellbeing (CECW, 1998). The recreation resources that are being proposed as part of the LOWRP comply with the philosophy and inclusion of the CESAD-PD-J 15 SEP 2004 Memorandum, are economically justified, and fall within the ten percent rule.

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 published jointly by the major federal land management agencies, America's Great Outdoors Report (February 2011). The documents recommend that land managers maintain or improve public access and recreational opportunities on government-owned lands and waters.

F.2 INTRODUCTION

This appendix contains a description of the conceptual recreation plan that is being proposed for the LOWRP at multiple sites on the wetland attenuation feature and wetlands along the Kissimmee River. This analysis will determine the net benefits for the recreation sites proposed within the Optimized TSP features. Recreation features are being included in the LOWRP as an incidental project benefit and will not be used in the justification of the Optimized TSP. Due to the incidental effect of the recreation elements, a determination of acceptable design to meet USACE standards has not been completed during the study phase. For the preliminary analysis, planning level recreation feature construction costs by site were provided by the SFWMD, amounting to \$ 1,987,700 in FY19 Dollars.

In accordance with ER 1105-2-100, the recreation feature Benefit-to-Cost Ratio analysis will be based on costs provided in the LOWRP Total Project Cost Estimate certified by the Walla Walla Cost Engineering Center of Expertise in April of 2019. The USACE certified estimate of LOWRP recreation features calculates costs at \$2,669,000 in FY19 dollars. The USACE standard 35 percent construction costs was added to this total to account for preconstruction engineering and design (PED), supervision and administration (S&A), and engineering during construction (EDC) to total \$2,682,450. Applying a 40 percent contingency yields a total project cost estimate of \$3,755,430.

The adjacent Lake Okeechobee, Kissimmee River and Water Management Areas currently receive visitors from all over the state and nation. The LOWRP project will experience increased visitation rates through

its geographic proximity to these areas and due to the large public interest in resource-based outdoor recreation opportunities.

The proposed features of the LOWRP recreation plan will not require additional real estate acquisition. All features will be compatible with the environmental purposes of the project and may increase socioeconomic benefits being generated by the project. The activities that will be permitted in the project include bicycle riding, nature study, wildlife viewing, walking, hiking, motor boating, canoeing, kayaking, fishing, and hunting. These activities are all well-suited to the environmental purposes of the project.

The LOWRP project offers two major features for recreation. The levee top around the WAF would offer approximately 33 miles of trails that will form 3 loops using the internal embankments. The wetland areas will offer approximately 26 river miles accessible by small boats from the C-38 canal or the WAF. Small boat portage sites will serve as levee trail features and enhance the boat connections between the wetland areas, WAF, and adjacent waterways. The levees will provide many recreational activities to include in Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) projected deficits described below.

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

F.3 BENEFIT CATEGORIES

This section outlines the benefit categories.

F.3.1 Study Area

The 2013 Florida SCORP divides the state into eight planning regions to assess the demand and need for outdoor recreation. In south Florida, four of these regions essentially meet on the shores of Lake Okeechobee and the Kissimmee River. This project will serve the needs of these four regions, including the region identified to have the greatest need for outdoor recreation opportunities. User-oriented recreation activity deficits identified by the SCORP for these regions include multiple resource-based outdoor activities. The population growth of south Florida will only add to the existing recreation deficits.

Figure F-1 provides the conceptual locations for the proposed LOWRP recreational features. Approximately 33 miles of levee would provide access for biking, hiking, jogging, hunting, fishing, nature study, and wildlife viewing. Approximately 26 additional river miles would wind through the connected wetlands. National recreation trends of walking, paddle sports, and wildlife-related recreational activities could also be accommodated.

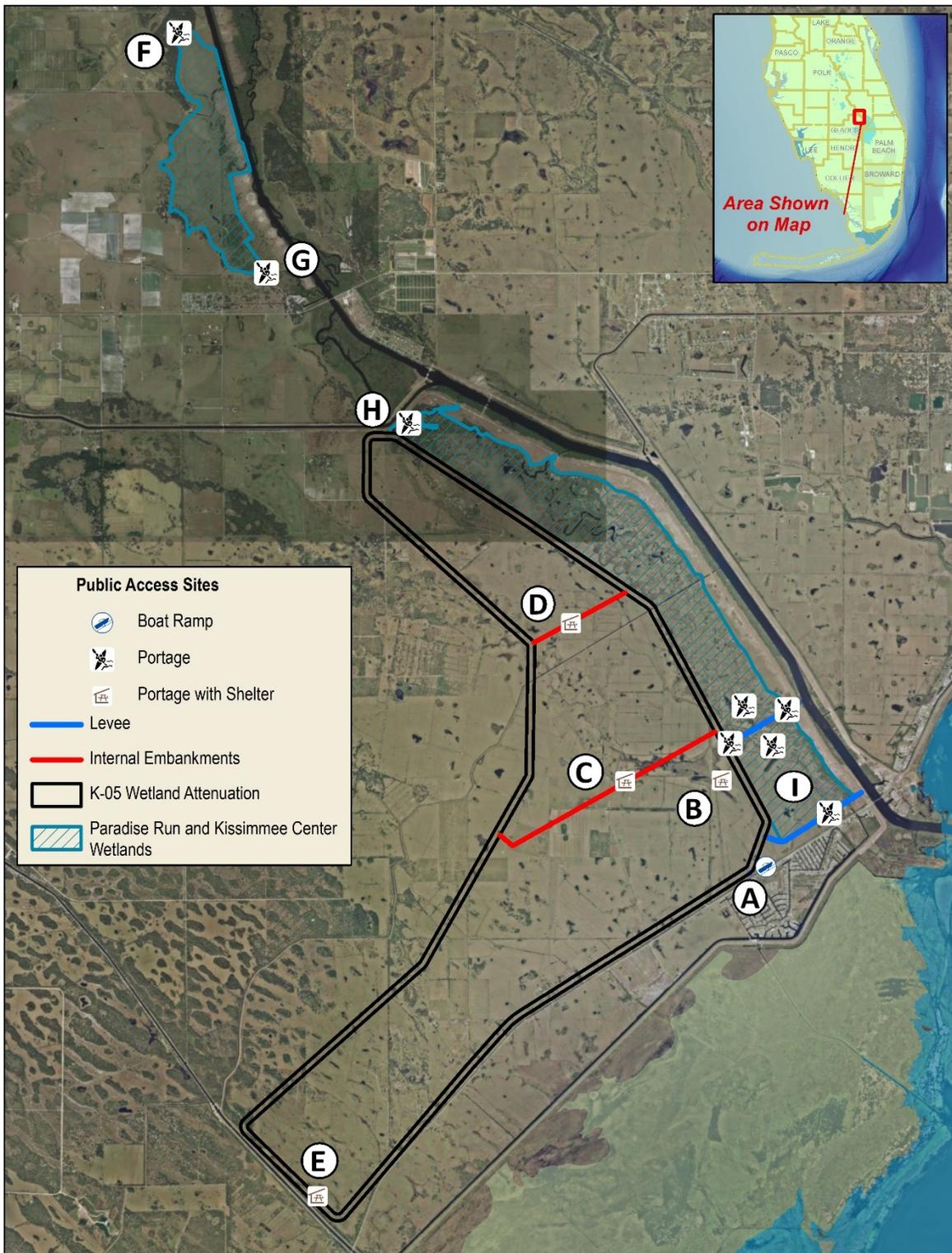


Figure F-1. Conceptual locations for the boat ramp, portages, and trail shelters at the spillway sites. Site B includes access into the wetland.

The WAF will have a boat ramp capable of serving motorized and non-motorized boats to enter the south cell. An example of a typical articulated block boat ramp is shown in **Figure F-2**. These would be accessed by vehicle ramps up the levee with limited parking at crest elevation and sufficient parking near, but not at the crest elevation of the levee. During design, areas will be identified for potential additional public parking that could be expanded outside the levees as necessary.



Figure F-2. Example of Articulated Block Boat Ramp

During project design, earthwork needed to provide the locations for public access facilities will be incorporated. Retaining construction staging areas and sharing boat ramps with staff are strategies utilized during project design to efficiently provide for recreation. These strategies are consistent with the planning approach in other restoration projects.

The recreation planning for the WAF and the wetlands would incorporate an adaptive management strategy to address the uncertainty regarding what vegetation will occur within the cells. The vegetation types and resulting wildlife that are found in different habitats greatly change the resource-based recreational interests. The project will also provide for blueways and greenways to circulate on the project levees and canals, and form connections between adjacent lands and water.

F.3.2 Site A Wetland Attenuation Feature Boat Ramp

Site A is one point of access to the water for both staff and public into the southernmost of the three WAF cells. Access to the site will be provided from highway SR78. A 24-ft. two-lane gravel road from an asphalt public road to the recreation facility is required. The boat ramp facility will also act as a trailhead to the levee for the multi-use trail, providing accessible parking at crest elevation and nearby public parking for vehicles and trailers. The perimeter of the parking area will have a board fence unless a perimeter is along a deep canal, where guardrail would be used. The parking surface will be shell rock or gravel and entrances to tops of levees will be controlled by standard vehicle gates and pedestrian pass-throughs.

Other features include a dual-gender vault toilet, bike racks, an informational kiosk, and interpretive signage.

Site A may also serve as a boat and trail connection to the Paradise Run wetland feature for walk-in or small non-motorized boat access. Project designs should not inhibit public access to circumnavigate the impoundment levees as pedestrians. Structures and pumps will incorporate pedestrian bypass routes as much as feasible. The recreation program will control access. The SFWMD would own fee title to this site.

The WAF component is not envisioned to have motorboats per the shallow impoundment description in the SFWMD Recreation Management and Partnership Plan. Typical boats would be smaller non-motorized boats with the potential exception of allowing electric trolling motors. Locating the public boat ramp into the south cell would leave the two northern cells available via portages. The SFWMD would own fee title to this site. The costs for this site should be, in part, supported by the costs that would be dedicated to a staff site with approach over the levee, turnaround area and the boat ramp.

Table F-1. Site A recreation features – SFWMD Cost Estimate

Feature	Quantity	Unit Cost	Total Cost
Vehicle/ Ped Gate	3	\$5,000	\$15,000
Kiosk Shelter 12'x16'	2	\$30,000	\$60,000
Picnic Tables	4	\$500	\$2,000
Roofed Sign Board 4x4' and signs	2	\$2,000	\$4,000
Signs	1	\$2,000	\$2,000
Bike Rack	2	\$1,000	\$2,000
Vault Toilet, 2 gender	1	\$40,000	\$40,000
Improved Vehicle Access Road (Shell Rock/Gravel) up to 1/4 mile = 25'x2'x1320 = 2444 cubic yards	2,444 cy	\$20	\$48,880
Post and Board Fence	1000	\$20	\$20,000
Guard Rails in Parking Area	200	\$200	\$40,000
Boat Ramp	1	\$100,000	\$100,000
Fishing Pier	325 feet	\$700	\$227,500
Deacceleration and left turn lanes			\$500,000
TOTAL			\$1,061,380

F.3.3 Sites B, C, D, E Wetland Attenuation Feature, Spillway, Portage and Trail Shelter Sites

Sites B, C, D, and E would be accessible by hiking or biking on the levee of the WAF or by boat internally. Site B, C, and D will be located at a spillway of a cell and will incorporate facilities to support fishing. Site B will be closest to the public access in the south and will have a greater portion of the facilities. Site E is not a spillway site and will be just a portage. Three of these four sites (B, C, and D) will have fishing piers

or platforms. Fishing piers or platforms will be coordinated with the designs of the spillway structure. The fishing features may be from the bridge deck, along the wing walls or extending into WAF areas as feasible. It may be found during design that concrete walkways in certain portions of the area will be better than wood platforms. At Site B, the fishing platform may extend into the wetland area. Spillway structures are built with a high bike rail picket railing as a safety feature when the structure is in an area open to the public.

All sites will have boat portages, information kiosk shelters, bike racks, and picnic tables. This offers shelter from weather and a resting place. A staff boat ramp or airboat crossing may be requested by Operations & Maintenance and, if located at a portage site, the Operations & Maintenance features may act as a substitute for the filled-cell articulated block portage features. The SFWMD would own fee title to these sites.

Table F-2. Sites B, C, D, E Recreation Features – SFWMD Cost Estimate

Site Features B, C, D, and E	Quantity	Unit Cost	Total Cost
Kiosk Shelter 12'x16' B(2), C, D & E	5	30,000	\$150,000
Picnic Tables (B-4) (C -2) (D-2) (E 2)	10	\$500	\$5000
Signs, all sites	4	\$2,000	\$8,000
Bike Racks, all sites	4	\$1,000	\$4,000
Small boat portage to cross levee, use an articulated filled block pathway on each side, all sites.	4	\$10,000	\$40,000
Widen levee near spillway for shelters 10 feet high 20 feet wide 30 feet plus slope on ends = 444 cy X 4. Site B C D and E	1776	\$20 per CY	\$35,520
Linear feet of fishing pier or platforms (B 400') (C 300') & (D 150')	850	\$700 / ft	\$595,000
TOTAL			\$837,520

F.3.4 Sites F, G, H, I Wetland Portages at Structures

These portages will be sited during design to provide small boat access from the north to the south areas of both the Kissimmee River Center and Paradise Run wetland features as reasonably feasible. This allows portages to be placed at appropriate locations depending on design decisions regarding operations, the structures designs, and actual locations. The culvert structures for portages are: Site G in the southern Kissimmee River Center at structure S-736, and site I in southern Paradise Run at potentially all 5 structures (S-728, S-729, S-730, S-731, S-732). The two pump structures in the north of each wetland, Site F (S-735) in the Kissimmee River Center and Site H (S-721) in the Paradise Run wetland are also potential portage locations. While kayak and canoe use would benefit from access in the north, pumps do not lend themselves well to small boat traffic. Portages should be located away from pump stations. Points near roads, the Kissimmee River, or along the WAF would facilitate an appropriate access point. Portages will

be incorporated where acceptable to pump operations, yet useful to the public. No motorboat launch ramps are intended for these portage sites. The SFWMD would own fee title to these sites.

Table F-3. Sites F, G, H, I Wetland Portages recreation features – SFWMD Cost Estimate

Site Features F, G, H and I	Quantity	Unit Cost	Total Cost
Signage	8	\$1,000	\$8,000
Small boat portages to cross levee, will use an articulated filled block pathway on each side, at all sites.	8	\$10,000	\$80,000
TOTAL			\$88,000

F.3.5 Total Planning-Level Construction Cost Estimate

The construction cost estimates for recreation features presented throughout **subsection F.3** of this appendix constitute a preliminary planning-level analysis conducted in coordination with SFWMD. These costs are totaled in **Table F-4**.

Table F-4. Summary of SFWMD recreation cost estimate.

Summary of Feature Tables	
Site A Table Summary	\$1,061,000
Site B, C, D, E Table Summary	\$838,000
Site H, I, J, K Table summary	\$88,000
Planning-Level Construction Cost Estimate	\$1,987,000

In accordance with ER 1105-2-100, the recreation feature Benefit-to-Cost Ratio analysis will be based on costs provided in the LOWRP Total Project Cost Estimate certified by the Walla Walla Cost Engineering Center of Expertise in April of 2019 (**subsection F.6**).

F.4 RECREATION BENEFITS

The national economic development (NED) benefit evaluation procedures contained in ER 1105-2-100 (22 Apr 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 UDV method was selected for estimating recreation benefits associated with the creation of the LOWRP. The UDV approach in recreation benefit analysis consists of two parts: determining value per visit and estimating visitation.

F.4.1 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- and without-project framework of analysis, provides the estimate of recreation benefits.

The FWO condition in the Lake Okeechobee portion of this analysis has little recreation value since the lands inside the LOWRP WAF are not open to the public. It is presumed that the impoundment would be opened to the public in order to realize the recreation benefits being claimed. The FWO condition for the Paradise Run area does currently offer minimal recreational opportunities as a small and separated part of the Kissimmee River area. To capture additional recreation benefits from this project area we must look at existing visitation and subtract that from projected visitation claimed by the additional proposed recreation features. The FWP condition 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. Guidelines for assigning points for general recreation.

Criteria	Judgment Factors				
Recreation experience Total Points: 30	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
Point Value: 21	0-4	5-10	11-16	17-23	24-30
Availability of opportunity Total Points: 18	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
Point Value: 3	0-3	4-6	7-10	11-14	15-18
Carrying capacity Total Points: 14	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
Point Value: 7	0-2	3-5	6-8	9-11	12-14
Accessibility Total Points: 18	Limited access by any means to	Fair access, poor quality roads to site; limited	Fair access, fair road to site; fair	Good access, good roads to site; fair access,	Good access, high standard road to

	site or within site	access within site	access, good roads within site	good roads within site	site; good access within site
Point Value: 13	0-3	4-6	7-10	11-14	15-18
Environmental Total Points: 20	Low aesthetic factors ⁶ that significantly lower quality ⁷	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
Point Value: 10	0-2	3-6	7-10	11-15	16-20
Point Sum 54					

Point value assignments for **Table F-5** above are based on Economic Guidance Memorandum (EGM) 19-03. 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 LOWRP recreation resources would provide several general activities that would be afforded by the project setting and the project levees. The proposed LOWRP 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-3**) for expanding local populations and increasing recreation demands. The environmental restoration component (dense marshlands, water storage and release) could help to provide an increase of quality freshwater boat and bank fishing for the region on project lands. The boat launching ramp, shelters, portages, fishing piers 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 quality activity. The perimeter to area ratio will allow for excellent alligator hunting opportunities with the higher catch rates similar to the STAs where the access by vehicle exceeds that of using an airboat. The controlled water levels and presence of vegetation will provide ideal conditions for quality waterfowl hunting and bass fishing.

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 includes the urban population of the Town of Okeechobee and primarily agricultural lands and several Wildlife Management Areas. A 50-mile radius would include all of the urban areas on Lake Okeechobee, a portion of the US27 urban corridor and a segment of the Florida east coast from Jupiter through Sebastian, more agricultural lands and several more Wildlife Management Areas, regional parks and greenways with similar resources occurring in the east urban setting. The proposed multi-use trail, freshwater bank fishing, boat launching and access from the Kissimmee River and shelters and benches would provide unique opportunities in the proposed water management areas. The proposed recreation resources will help to provide facilities for current and projected statewide Central, Central East, Southeast, and Southwest regions identified in SCORP. There are similar recreation opportunities available within a 1-hour travel time and a few within a 30-minute travel time.

The proposed LOWRP 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 will 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. New access points will be developed for public and staff off SR78 and SR70, these would provide good access to the proposed sites. The levees would provide approximately 33 miles of good multi-use trail access on the wetland attenuation feature and within the wetlands. Project wetlands would provide approximately 26 river miles interconnected to the C-38 or accessible from the wetland attenuation feature levees via small boat portages.

The environmental quality rating is based upon the existing natural resources and aesthetic quality of the proposed project area. The proposed site of the wetland attenuation features possess poor aesthetic resources which would be dramatically improved with the LOWRP construction. These areas would provide panoramic views of open water and Everglades and Kissimmee River type landscape features. The best aesthetics of the proposed project areas are of views from the levee inward over the marsh lands within the wetland attenuation features and wetlands connected to the Kissimmee River. Views from the LOWRP wetland attenuation feature levees to the north and west would be of the agricultural lands currently in cattle production.

The value of a day of general recreation at the proposed recreation sites for the Lake Okeechobee Watershed Restoration Project 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 Economic Guidance Memorandum 19-03, Unit Day Values for Recreation, for Fiscal Year 2019 which is based on ER 1105-2-100. **Table F-6** was used to convert points to a UDV FY2019 dollar amount. Using linear interpolation, the total point value for the recreation sites was determined to be 54. The user day value conversion equivalent is \$9.11

Table F-6. Conversion of points to dollar values for 2019 per Economic Guidance Memorandum 19-03 unit day values for recreation for fiscal year 2019.

Point Values	General Recreation Values
0	\$4.14
10	\$4.92
20	\$5.44
30	\$6.21
40	\$7.77
50	\$8.80

60	\$9.58
70	\$10.10
80	\$11.13
90	\$11.91
100	\$12.43

F.4.2 Estimating Visitation

The State of Florida's Department of Environmental Protection's Division of Recreation and Parks coordinated and developed the Florida Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2013 and prior years. The current SCORP, 2013 indicates low levels of service compared to other regions for all evaluated activities based on user participation surveys. Activities associated with lower levels of service associated proposed for LOWRP recreation activities are bicycling, hiking, nature study, and non-boat freshwater fishing. These low levels of service will likely continue as population is projected to increase in coming decades.

The Central, Central East, Southeast, and Southwest Regions share the shores of Lake Okeechobee and Kissimmee River and these two resources have shown to draw the public from those regions. The LOWRP wetland attenuation feature would be a large inland body of freshwater marsh and the wetlands will be accessible from the Kissimmee River. Both project features are in an area of the state where Lake Okeechobee and the Kissimmee River are central to resource-based recreation.

The carrying capacity guidelines established by the SCORP of 2008 (**Table F-7**) were used to inform the visitation analysis. 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. In every case LOWRP visitation rates were estimated to be substantially lower than the SCORPs published rates.

Table F-7. SCORP carrying capacity guidelines.

Activity	Units Provided	Maximum Area Requirements	Guidelines Capacity	Regions with Below Average levels of service
Hiking Unpaved Biking	33 miles of levee top	10-20 per mile	40-80 users per mile per day	Central Southeast
	26 river miles 20 canal miles	1-2 users per boat	1-2 boats per Sq. mile	

Activity	Units Provided	Maximum Area Requirements	Guidelines Capacity	Regions with Below Average levels of service
Boating (motorized & non)	19 sq. miles of impoundment			Central Southwest Southeast
Nature Study	10 miles	5-20 groups per mile	40 -160 users per mile of trail/day	Central Southwest Southeast
Freshwater Bank Fishing	23,760 feet	10 linear feet of bank per person	5 LF of bank per user mile	Central Southwest Southeast

The use guidelines designated for biking, hiking, fishing 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 40-80 users per mile per day and assume 10–20 riders per mile per day with a daily turnover rate of 4. The use guideline for hiking trails, 4–20 hikers per mile per day with a daily turnover rate of 4. The LOWRP consist of approximately 33 miles of proposed levee top multi-purpose trails available for use. These multi-purpose trails close to the community Lake Okeechobee will see use as urban exercising opportunities as well as resource-based use. River miles were estimated as 1.75 times the line miles.

It is assumed that 10 linear feet of LOWRP wetland attenuation feature shoreline is required for each person fishing at any given time. It is assumed that this space will 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 inflow and outflow structures gated structures. It is also assumed bank fishing would occur up to a $\frac{1}{4}$ mile away from the structures on either side. Nine such structures are relatively close to the trailheads totaling 4.5 miles (23,760 linear feet) of bank fishing associated with the LOWRP wetland attenuation feature and wetlands for benefit estimation purposes.

These activities are planned in the LOWRP 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, the study team believes there would be ample use of the proposed recreation facilities and by 2070 fully expects a continued shortage in some of the existing activities in this area.

User visitation rates were estimated using relevant results from the SCORP 2016-2017 Participation Study, which catalogued over 4,000 completed surveys from Florida residents representing each of the state's 67 counties. The SCORP 2016-2017 Participation Study identifies what activities Florida residents

have participated in during the last 12 months and where they participated. The research also analyzes frequency of participation and calculates resident and tourist demand indices for activities which simultaneously account for both volume and frequency of demand.

SCORP research projects typically analyze data at a statewide level and sometimes at the regional-level within a state. County-specific results are not usually offered because county-level sample sizes are often too small to be interpreted with adequate confidence.

Due to the LOWRP’s relatively rural location and rustic/minimal recreation features proposed, it was determined that an extremely conservative usage rate would be projected. For the purposes of this analysis, regional and statewide participation rates were applied to a study area including only the census block groups directly bordering the project area (Table F-8 and Figure F-3).

Table F-8. LOWRP recreation study area by county and SCORP region.

	SCORP Region		
	Central	Southwest	Central East
LOWRP County	Highlands	Glades	Okeechobee
Census Block Groups	961500-1	1-1 1-2	910101-2 910602-1
Total Households	213	941	1,012

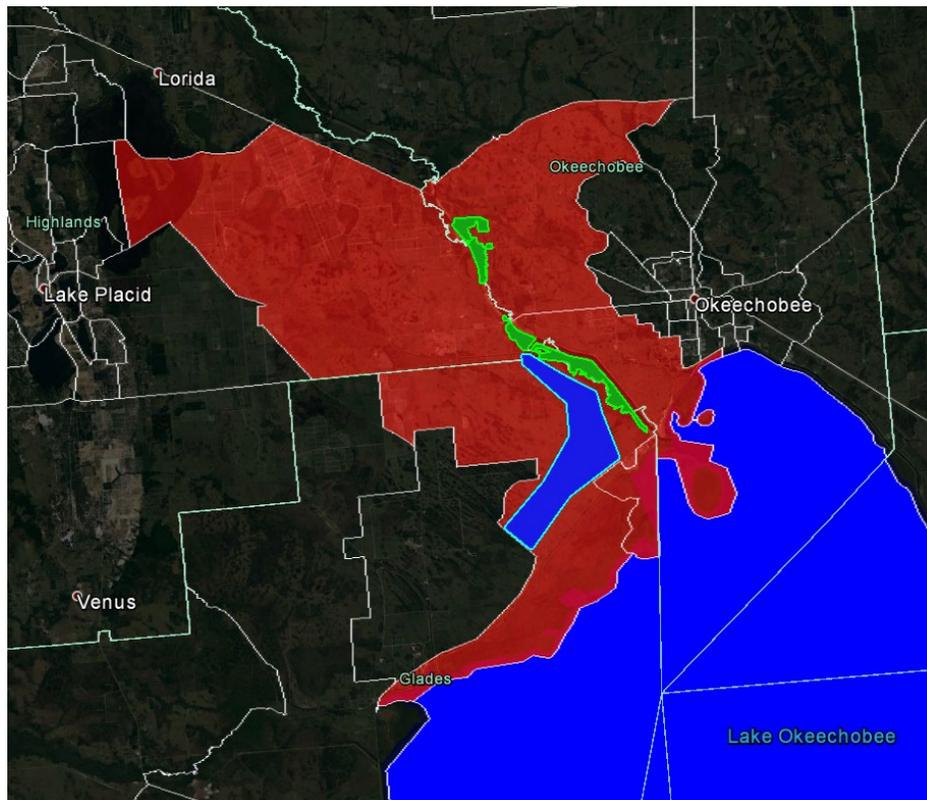


Figure F-3. LOWRP recreation study area.

The following steps were taken to express total recreation participation of the market on a daily basis:

- SCORP regional household participation estimates were applied to the LOWRP recreation study area (**Table F-8**) to estimate the number of households participating in a given recreational activity per year (**Table F-9**).

Table F-9. LOWRP recreation household participation estimation.

	Household Participation in Recreational Activities in FL in Past 12 months by SCORP Region (Resident Survey Results)			Estimated Number LOWRP Recreation Study Area Households Participating per Year
	Central Region	Southwest Region	Central East Region	
Unpaved Bicycling	15.5%	13.2%	11.3%	271
Hiking	40%	39%	39%	847
Freshwater Boat Ramp	19%	13%	15%	315
Nature Study	25%	30%	31%	649
Freshwater Bank Fishing	19.5%	17.1%	21.1%	416
Canoe/Kayak/SUP	28%	32%	26%	624

- The mean SCORP statewide participation durations for households engaging in each respective activity were converted to yearly percentages. These yearly percentages were applied to the LOWRP estimated number households participating per year.
- Lacking individual-level participation data, the minimum number of participants that SCORP household data could represent was assumed. Converting at 1 person per household, this approach yields a total daily recreation participation of 134 persons (**Table F-10**).

Table F-10. LOWRP recreation average daily visitation estimation.

	Mean Days of Participation (FL Households with Participation > 0)	Percent of Year Participating (FL Households with Participation > 0)	Estimated LOWRP Average Daily Participation
Unpaved Bicycling	40.1	11.01%	30
Hiking	16	4.39%	37
Freshwater Boat Ramp	14	3.84%	12
Nature Study	13.9	3.82%	25
Freshwater Bank Fishing	12.8	3.51%	15
Canoe/Kayak/SUP	9.3	2.55%	16
Total			134

The projected usage rates follow the resource needs and guidelines published by the SCORP, but in every case rates were estimated to be substantially 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 will be utilized to their potential. This the most practical scenario for justifying the proposed recreation features for the LOWRP.

F.5 ECONOMIC JUSTIFICATION OF RECREATION

The justification of 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-10**.

Engineering Regulation 1105-2-100 (The 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. The federally mandated project evaluation interest rate of 2.875 percent, an economic period of analysis of 50 years and 2019 price levels were used to evaluate economic feasibility. The construction cost estimates for recreation features presented throughout **subsection F.3** of this appendix constitute a preliminary planning-level analysis conducted in coordination with SFWMD. In accordance with ER 1105-2-100, the recreation feature Benefit-to-Cost Ratio analysis will be based on costs provided in the LOWRP Total Project Cost Estimate certified by the Walla Walla Cost Engineering Center of Expertise in April of 2019.

Total project recreation feature construction costs were estimated at \$2,669,000 in FY 2019 dollars. The USACE standard 35 percent construction costs was added to this total to account for preconstruction engineering and design (PED), supervision and administration (S&A), and engineering during construction (EDC). Applying a 40 percent contingency yields a total project recreation cost estimate of \$5,044,410. Including an Interest During Construction cost of \$780,637, this amounts to an average annual cost of \$221,049 over a 50 year period of analysis at the FY19 discount rate (2.875%). These figures are compared against the project recreation benefits (**subsection F.4**) are presented in **Table F-11**.

Table F-11. USACE Certified Cost Estimate – Benefit-to-Cost Summary

Summary of Feature Tables	
Total Project Recreation Feature Construction Cost	\$2,669,000
PED, S&A and EDC (35 Percent Construction Cost)	\$934,150
Contingency (40 Percent Construction, PED, S&A and EDC)	\$1,441,260
Total Cost including contingency	\$5,044,410
Interest During Construction	\$780,637
Total Investment	\$5,825,047
Amortized	\$221,049
Preliminary Average Annual Cost	\$221,049
Unit Day Value	\$9.11
Daily Use	134
Annual Use (134 users x 365 days)	48,990
Average Annual Benefit	\$446,301

Summary of Feature Tables	
Benefit to Cost	2.0
Net Annual Benefits	\$225,252

This analysis leads to the conclusion that the benefit to cost ratio is 2.0. Average annual costs amount to \$221,049. The benefit to cost ratio for the recreation features equals 2.0 to 1 with net annual benefits equaling \$225,252.

F.6 SENSITIVITY ANALYSIS

A sensitivity analysis was conducted to further reinforce expected benefits and provide extra support for the justification of recreation features. **Table F-12** presents a sensitivity analysis which contains the expected average annual benefits from the above table and a worst-case scenario depicting the minimum number of annual visitors required for benefits to equal costs.

Table F-12. USACE Certified Cost Estimate – Benefit-to-Cost Summary Sensitivity Analysis

Scenario	Annual Users	Average Daily Users	Annual Benefit
Projected	48,990	134	\$446,301
Worst Case Scenario to Cover Annual Cost	24,264	67	\$221,049

A minimum average rate of 67 users per day would be required to generate enough average annual benefits justify the proposed costs for recreation.