

APPENDIX H
RECREATION

This page intentionally left blank.

APPENDIX H RECREATION APPENDIX

H.1 AUTHORIZATION

The Comprehensive Everglades Restoration Plan, authorized by the Water Resources Development Act of 2000 (WRDA 2000), will 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 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 well being (CECW, 1998). The recreation resources that are being proposed as part of the CERP Site One Impoundment project will 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.

H.2 INTRODUCTION TO RECREATION FOR THE SITE 1 IMPOUNDMENT

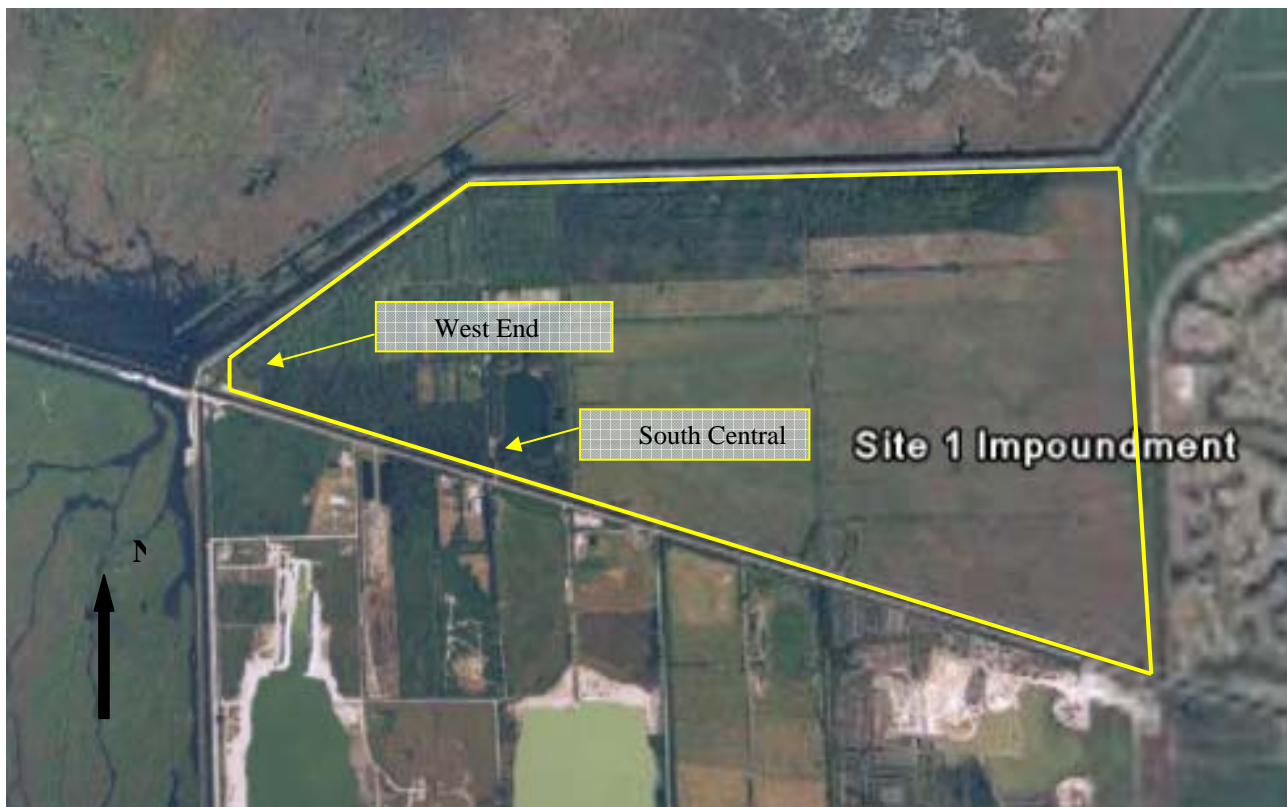
This appendix contains a description of the conceptual plan that is being proposed for the Site 1 project for recreation purposes at three sites within the Site 1 Impoundment footprint. The three sites: South Central, and West End are shown in **Figure H-1**. Recreation features are being included in the Site 1 Impoundment project as an incidental project benefit. These recreation benefits will not be used in the justification of the recommended plan. South Florida Water Management District (SFWMD) estimators presented the following cost estimates for recreation structures. Due to the incidental effect of these recreation elements, a determination of acceptable design to meet Corps standards has not been completed at this time. The South Florida Water Management District will be managing the Site 1 Impoundment recreational opportunities. Adjustments may be made to the dollars spent depending on project design. Total costs for recreation structures, including footbridges would be \$351,000. An additional 12% for planning, engineering and design (PED), and an additional 8% for supervision and administration (S&A) bring the estimated total costs for recreation to come to \$421,000.

The Site 1 Impoundment will be one of the largest freshwater impoundments in the lower east coast of Florida. The magnitude of this impoundment, and the enhanced fishing and canoeing opportunities, will attract users from all around south Florida. The adjacent Loxahatchee National Wildlife Refuge (LNWR) currently experiences over 300,000 visitors per year, and visitors come from all over the state and nation. The Site 1 Impoundment will experience increased visitation rates though it's geographic proximity to the LNWR and due to large public

interest in the CERP. As available adjacent lands become developed, the local draw of visitors to the Site 1 Impoundment will increase and the Impoundment will experience both regional and local visitors.

The proposed features of the Site 1 Impoundment recreation plan will not require additional real estate to be purchased. All features will be compatible with the environmental purposes of the impoundment, and will not detract from the environmental or socioeconomic benefits being generated by the project. The activities that will be permitted in the impoundment (bicycle riding, nature study, walking, picnicking, canoeing, fishing, etc.) are all well suited to the environmental purposes of the project. A major recreation attraction of the Site 1 Impoundment will be a 13-mile loop of trails that will be on the levees that are being constructed as part of the project.

FIGURE H-1: SITE 1 IMPOUNDMENT CONCEPTUAL RECREATION PLAN



H.3 BENEFIT CATEGORIES

H.3.1 Study Area

The study area for the recreation benefit analysis is specific to the County of Palm Beach, Florida. The 2000 Florida Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies the proposed project area as part of Region X comprised of Palm Beach, Martin, St. Lucie and Indian River Counties. Recreation deficits identified by the SCORP for this region include; bicycle riding, freshwater fishing, hiking, saltwater beach activities, saltwater fishing

and swimming pool use. A statewide needs through 2010 identifies deficits for bicycle riding, camping, fresh and saltwater beach activities, non-boat fresh and saltwater fishing, hiking, nature study, golfing, shuffleboard and pool swimming (SCORP, 2000).

The population growth of south Florida will only add to the projected existing recreation deficits. Regional population figures and future population estimates were not factored into **Table H-8** because the additional figures would display extreme recreation deficits that in all probability would not be accurate. The proposed ancillary recreation resources study area is within the project study area on Site 1 Impoundment, Palm Beach County, Florida, just east of the Everglades levee.

H.3.2 South Central

A vehicle bridge that crosses the Hillsboro Canal will be used for access to this site. It is proposed that the staging area for the construction of the Site 1 Impoundment occur at this place. The vehicle bridge will offer an easy access point, and upon completion of the impoundment, the staging area can be used as a parking area for visitors to the impoundment. The site may also be accessed by walking one mile down the southern levee from the West End site. This location will provide access to an existing deepwater mine that will provide fishing year round, and may provide excellent fishing during periods of low water in the impoundment due to concentrated fish populations. An elevated boardwalk with a viewing platform on the end will extend into the deepwater area, and provide nature watching and fishing opportunities. There is also a proposed canoe launch at this point, an information kiosk and a covered picnic shelter with tables and basic sanitation facilities without potable water or electricity. This site will provide access to the trail system and the canals. No additional recreation costs will be need for the trail system, since this will be on levees that are part of the project construction. The preliminary cost estimate for this site is \$322,000 as shown in **Table H-1**.

TABLE H-1: RECREATION FEATURES OF SOUTH CENTRAL SITE

Feature	Quantity	Unit Cost	Total Cost
Elevated Boardwalk 6' x 200'	1	\$140,000	\$140,000
Viewing Platform 10' x 20'	1	\$50,000	\$50,000
Picnic Shelter 10' x 20' W/Tables	1 4	\$25,000	\$25,000
Canoe Launch	1	\$35,000	\$35,000
Information Kiosk	1	\$10,000	\$10,000
Parking Area Handicap Access	15 Spaces	\$50,000	\$50,000
Sanitation Facility	2 units	\$12,000	\$12,000
Site Total			\$322,000

H.3.3 West End

This western site will be available because of the acute angle of the site and the location of a communication tower already in that corner and the necessity of land for the ASR project. A picnic shelter here will compliment the existing LNWR and other SFWMD facilities at this juncture of the LNWR and WCA-2). The existing facilities at the LNWR are information kiosk for the LNWR, restrooms, public parking, and multiple boat ramps. There are no existing picnic tables or weather shelters in this area. This site will be accessed after entering the LNWR by walking across an existing SFWMD water control structure that now allows pedestrian and bike traffic on the levee. Currently pedestrians and bicyclists must step over the vehicle gate and lift bikes or other equipment over it. The vehicle gate should be relocated several feet forward so a pedestrian walkthrough may be added. Land for the shelter will need to be clear and level and will encompass about $\frac{3}{4}$ of one acre, the land adjacent to the ASR is proposed. The elevation necessary is uncertain however it the land will need to remain dry. The preliminary cost estimate for this site is \$20,000 as shown in **Table H-3**.

TABLE H-3: RECREATION FEATURES OF WEST END SITE

Feature	Quantity	Unit Cost	Total Cost
Picnic Shelter 10' x 20'	1	\$25,000	\$25,000
Vehicle Gate	1	\$4,000	\$4,000
Site Total			\$29,000

H.4 RECREATION BENEFITS

The national economic development (NED) benefit evaluation procedures contained in ER 1105-2-100 (22 Apr 00), 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 Site 1 Impoundment. 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 without project condition in this analysis have no recreation value since the Site 1 Impoundment would not exist and the land would not be open to the public. It is presumed that the impoundment must be opened to the public in order to realize the recreation benefits being claimed. The with-project condition will be the expected value of the recreational activity based on the UDV method. Table 1 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 of activities, facilities, relative scarcity, ease of access, and aesthetic factors.

TABLE H-4: GUIDELINES FOR ASSIGNING POINTS FOR GENERAL RECREATION

Criteria	Judgment factors				
Recreation experience ¹ Total Points: 30 Point Value: 15	Two general activities ² 0-4	Several general activities 5-10	Several general activities: one high quality value activity ³ 11-16	Several general activities; more than one high quality high activity 17-13	Numerous high quality value activities; some general activities 24-30
Availability of opportunity ⁴ Total Points: 18 Point Value: 2	Several within 1 hr. travel time; a few within 30 min. travel time 0-3	Several within 1 hr. travel time; none within 30 min. travel time 4-6	One or two within 1 hr. travel time; none within 45 min. travel time 7-10	None within 1 hr. travel time 11-14	None within 2 hr. travel time 15-18
Carrying capacity ⁵ Total Points: 14 Point Value: 8	Minimum facility for development for public health and safety 0-2	Basic facility to conduct activity(ies) 3-5	Adequate facilities to conduct without deterioration of the resource or activity experience 6-8	Optimum facilities to conduct activity at site potential 9-11	Ultimate facilities to achieve intent of selected alternative 12-14
Accessibility Total Points: 18 Point Value: 10	Limited access by any means to site or within site 0-3	Fair access, poor quality roads to site; limited access within site 4-6	Fair access, fair road to site; fair access, good roads within site 7-10	Good access, good roads to site; fair access, good roads within site 11-14	Good access, high standard road to site; good access within site 15-18
Environmental Total Points: 20 Point Value: 8	Low esthetic factors ⁶ that significantly lower quality ⁷ 0-2	Average esthetic quality; factors exist that lower quality to minor degree 3-6	Above average esthetic quality; any limiting factors can be reasonably rectified 7-10	High esthetic quality; no factors exist that lower quality 11-15	Outstanding esthetic quality; no factors exist that lower quality 16-20

Point value assignments for **Table H-4** above are based on Economic Guidance Memorandum (EGM) 04-03. 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 reviewed after several site visits and coordination with local agencies. The following selection factors were used for the criteria outlined in **TableH-4**:

- The Site 1 Impoundment proposed recreation resources would provide an area specific, unique recreation opportunity afforded by the project setting and the project levees adjacent to the Everglades. The site offers solitude and a very panoramic setting in a growing metropolitan area, and would provide specific recreation amenities (as outlined in Table 1) for expanding local population increasing demands. The environmental restoration component (water storage and release) could help to provide an increase of quality freshwater pier and bank fishing for the region on project lands. Canoe launching and covered picnicking facilities would also make use of the panoramic views and enhanced environment. The point value rating is estimated in the middle end of the judgment factor scale because of the general activities that would sustain a regional use in the Palm Beach County area.
- 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 the more of the Everglades and a couple of other regional parks with similar resources. The proposed multi-use trail, freshwater bank and pier fishing, canoe launch and covered picnicking facilities would provide unique opportunities in the environmentally restored project area. The proposed recreation resources will help to provide facilities for current and projected statewide Region X deficits.
- The proposed Site 1 Impoundment Area Restoration Project recreation resources carrying capacity point values are estimated to improve with the recreation component construction. The general recreation 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 non-boat fishing, multi-use trail and environmental observation comprise a large part of the projected recreation resources use. Peak use is conservatively projected to occur during half of the calendar year.
- The accessibility rating is based upon the availability of local highways, roads and streets in good condition that would provide access to the proposed recreation facilities. Direct routes from the east on paved roads provide good access.
- The environmental quality rating is based upon the existing aesthetic values of the proposed Site 1 Impoundment Area recreation resource facilities and the ease of correcting any limiting aesthetic factors. The proposed site possesses good aesthetic resources given that the area borders the Everglades with panoramic views. The best aesthetics of the proposed project area are views from the Site 1 Impoundment Area levee out over and of the Everglades to the west.

The value of a day of general recreation at the proposed Site 1 Impoundment Area Project was determined for each project activity using the guidelines for Assigning Points for the General Recreation in Table 1. The points were then converted to dollar values using conversion factors

included in the Economic Guidance Memorandum 04-03, Unit Day Values for Recreation, 2001, which is based on ER 1105-2-100. **Table H-5** was used to convert points to a UDV FY2003 dollar amount. The 42 points resulted in a user day value of \$5.78. The next step is to estimate the annual use over the project life.

TABLE H-5: CONVERSION OF POINTS TO DOLLAR VALUES

Point Values	General Recreation Values
0	\$3.00
10	3.57
20	3.94
30	4.50
40	5.63
50	6.38
60	6.94
70	7.32
80	8.07
90	8.63
100	9.01

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 2000. This information was used to derive and project total recreation participation and allocate this participation from state to regional levels. The SCORP also includes guidelines for resource based outdoor recreation activities as listed in **Table H-6**. 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. The Treasure Coast Region (Region 10) includes Palm Beach County, along with other adjacent counties. The Site 1 Impoundment is a geographically large inland body of freshwater in an area of the state where state based recreation resources are mainly coastal and saltwater based. SCORP was determined to be the best available resource for estimating recreation usage and demands, based on the size of the impoundment and lack of available state resources in the area.

The current SCORP indicates demands not met for the year 2010 with several activities associated with Site 1 recreation. These demands not met will be much greater by the year 2050 as population almost doubles, but for economic justification purposes, user rates were calculated using the demand projection for 2010. Utilizing the guidelines and demands available from the SCORP, reasonable user rate projections can be determined. *Due to the Site 1 Impoundment's relatively rural location and rustic/minimal recreation features being incorporated, 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 activity were estimated to be substantially lower than the SCORP published rates. It is also anticipated that the recreation opportunities will be diminished during dry periods, and only several miles*

on either side of the access points will be utilized to their potential. This in essence is the most practical scenario for justifying adding recreational features to the Site 1 Impoundment project.

The use guidelines for designated bicycle, 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 guideline of 40 to 80 users per mile per day assumes 10 to 20 riders per mile per day with a daily turnover rate of 4. The use guideline for hiking trails, 4 to 20 hikers per mile per day, assumes 1 to 5 groups of 2 hikers per mile per day with a daily turnover rate of 2. The guideline for nature trails, 40 to 160 persons per mile per day, assumes 5 to 20 groups of 2 hikers per mile per day with a daily turnover rate of 4. The Site 1 Impoundment consists of approximately 13 miles of trails and canals that are available for use. A conservative approach was used for the purpose of usage projections. Only 4 miles of trails and canals were used to determine daily usage rates, because it is expected that while all available trails will be utilized, the trails and canals two miles to either side of the access points and parking facilities will be utilized most frequently. This essentially underestimates the potential daily usage rates, but was determined to be the most likely scenario.

It is assumed that 10 linear feet of pier is required for each person 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. In the United States, anglers outnumber golfers nearly two to one, with Florida ranking number one in terms of numbers of adult anglers. The adjacent LNWR has an estimated 69,000 anglers yearly, of which thousands are bank fishers

Even though the SCORP Projections for Region 10 show no projected shortage of picnic facilities or nature study in the region by the year 2010, the Site One Impoundment Recreation Proposal is planning to provide two group picnic shelters and eight picnic tables for potential users to accommodate the expected demand that will increase as population nearly doubles by the year 2050. These features were not used in determining annual user rates, but were incorporated in the total recreation costs. With ensuing development in the immediate area, and the increase in population projections for the State of Florida the study team believes there would be ample use of the proposed picnic facilities and by 2050 fully expects a shortage of both picnic facilities and nature study. The group shelter and picnic tables proposed could also function as an outdoor education opportunity for local school students in the immediate project area.

TABLE H-6: MOST LIKELY RECREATION PARTICIPATION USER DAY PROJECTION

Activity	Units Provided	Maximum Area Requirements	Turn over Rates	SCORP Guidelines	SCORP Region 10 Resource Needs (2010)		Site 1 Projected Expected Users
					User Occasions	Units	
Bicycling	13 miles	10-20 users Per Mile	4/day	40-80 users per mile per day	14,417,186	1,043 miles	15
Jogging							15
Walking							15
Picnicking	8 tables		2/day	8 users per day per table	1,643,781	0 tables	N/A
Canoeing	13 miles of canals and Impoundment	1-2 users per canoe	2/day	1-2 canoes per acre or mile	N/A	N/A	10
Nature Study	13 miles	5-20 groups per mile	4/day	40-160 users per mile of trail/day	1,058,861	0 miles	N/A
Freshwater Pier Fishing	200 linear feet	10 linear feet of pier, jetty or catwalk per person	2/day	5 linear feet of pier, jetty or catwalk per user per day	1,678,705	33,618 feet	20
General Recreation Total							75 users per day

H.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 project can be ascertained by comparing the equivalent average annual charges with the estimate of the equivalent average annual benefits, which would be realized over the period of analysis. These average annual recreation benefits and costs are summarized in **Table H-7**.

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 ER 1105-2-100 dated 22 April 2000 were observed in preparing this cost analysis. The federally mandated project evaluation interest rate of 5 3/8 percent, an economic period of analysis of 41 years and current prices were used to evaluate economic feasibility.

TABLE H-7: SUMMARY OF COSTS AND BENEFITS

Annual Costs	
Total Recreation Costs	\$363,000
Interest during PED and Construction	\$40,800
Total Investment Cost	\$403,800
Average Annual Cost	\$29,600
Interest	\$24,600
OMRR&R	\$5,000
Annual Benefits	
Unit Day Value	\$5.78
Daily Use	75 users
Annual Use	27,375 (75x365)
Average Annual Benefit	\$158,227
Benefit to Cost	5.35
Net Annual Benefits	\$128,627

This analysis leads to the conclusion that there are nearly six times the benefits than the costs. The benefit to cost ratio for the recreation features equals 5.35, with net annual benefits equaling \$128,627.

H.6 SENSITIVITY ANALYSIS

A sensitivity analysis was conducted to further reinforce expected benefits and provide extra support for the justification of recreation features. **Table H-9** includes a sensitivity analysis which contains the expected average annual benefits from the above table, 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 (**Table H-8**). As can be noted from this sensitivity analysis, a minimum average rate of 13 users per day would be required to justify the proposed costs for recreation, and following the minimum guidelines from SCORP the expected minimum benefits from the site could be 3.5 million dollars. Recreation planners

determined that both of these cases were extreme, and the most likely scenario resulted in approximately \$160,000 in average annual benefits.

TABLE H-8: RECREATION PARTICIPATION USER DAY CAPACITY METHOD USING SCORP GUIDELINES

ACTIVITY	# OF UNITS	DAILY TURNOVER RATE	INSTANTANEOUS CAPACITY/UNIT	DESIGN DAY LOAD
Multi-Use Trail Existing Use	13 miles	2/day	4-20 users/mile	520 #364
Nature Study of Everglades Existing Use	13 miles	4/day	5-20 users/mi	520 #364
Freshwater Non-Boat Fishing	200LF	2/day	4	24
Interpretive Features	1 sign	6	4	24
Canoe launching	2/launches	36 boats/day	2	144
Picnicking	4 tables	2/day	32	256
Total				1,656

TABLE H-9: SENSITIVITY ANALYSIS USING MULTIPLE SCENARIOS

Scenario	Annual Users	Daily Users	Annual Benefit
Most Likely Scenario	38,325	75	\$158,227
Worst Case Scenario	4,878	13	\$28,196
SCORP Guidelines	604,440	1,656	\$3.5 million



The photograph on the cover is provided courtesy of Steve Sutterfield.



**US Army Corps
of Engineers®**
Jacksonville District



South Florida Water
Management District