

**APPENDIX H
RECREATION PLAN**

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H.0 RECREATION PLAN

H.1 AUTHORITY

The Comprehensive Everglades Restoration Plan (CERP), 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 WRDA 1996. The Federal Water Project Recreation Act (P.L. 89-72) and the WRDA 1986 (P.L. 99-662) provide guidance for recreation proposals on Federal projects. A 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 (SFERR).

Additional authorization and guidance for the proposed ancillary recreation resources development is contained in the 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 C-111 Spreader Canal (C-111 SC) Western 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 PROPOSED FOR THE C-111 SPREADER CANAL

The recreation appendix for the C-111 SC Western project implementation report (PIR) contains a description of the proposed recreation elements and conceptual plan. The objective of the proposed recreation concept is to identify the restoration compatible recreation that is ancillary and complimentary to the proposed project (refer to **FIGURE H-1**). The recreation elements proposed are incidental benefits and would not be used in the justification of the recommended plan. Rough Order of Magnitude (ROM) costs have been provided by the SFWMD and have been included in the U.S. Army Corps of Engineers (USACE), Jacksonville District, Microcomputer Aided Cost Engineering System (MCASES) costs. A determination of recreation facility design standards to meet USACE and local building code requirements is underway. The SFWMD would operate and maintain the proposed recreational features. Adjustments may be made to the dollars spent depending on Congressional funding, sponsor budget, and project design. The costs for proposed recreation features would be \$165,000. An additional 12 percent for planning, engineering and design (PED),

and an additional eight percent for construction supervision and administration (S&A) bring the estimated total costs for recreation to \$198,000.

H.2.1 Proposed Recreation Overview

The C-111 SC Western Project Recommended Plan (Alternative 2DS) would include the following features:

1. 590 Acre Frog Pond Detention Area (FPDA) with a maximum pool depth of 3 feet – includes pump to intercept available water
2. Pump Upstream of S-177 to discharge into the Aerojet Canal and Connector canal between the pump and Aerojet Canal
3. One new operable structure in the lower C-111 Canal
4. Incremental operational changes at S-18C
5. One plug at S-20A
6. Operational changes at S-20
7. 10 plugs in the C-110 Canal
8. Recreational Components
9. Project Monitoring Plan
10. Draft Project Operating Manual
11. OMRR&R

The recreation plan would be incorporated into the first two features, namely the FPDA and the Aerojet Canal. The recreation facilities proposed would include: a trailhead with vehicular parking, traffic controls (entrance gate and fencing), a shade shelter with an interpretive board, and approximately 6.8 miles of designated multi-use levee trails atop impoundment cell levees. An entrance gate and fencing would be used to control access to the trailhead facilities. All levees would provide access for hiking, bike riding, bank fishing, wildlife watching, and environmental interpretation with no associated recreation cost. Filled impoundment levee corners would provide ample areas for visitor to congregate to bird watch, bike, and hike. Hiking and biking use on the levee crowns would not affect the levee crown integrity enough to propose paving or soil cement. Hunting may be proposed based on permit and management coordination with Florida Fish & Wildlife Conservation Commission (FWC). It is envisioned proposed project structures would provide pedestrians access to loop trails around the impoundments on the levees.

Proposed recreation facilities and activities would be ancillary to the proposed C-111 SC Western project and work harmoniously with project purposes. The proposed project recreation facilities would help to fill four Statewide

Comprehensive Outdoor Recreation Plan (SCORP) regional deficits and link with other regional recreation facilities. An example of this concept would be to link the proposed project component recreation sites via greenway or blueway to connect and extend points of destination with federal, state, county and private facilities. An international pool of visitors may be expected at the proposed project recreation facilities.

No additional real estate would be required for the proposed recreation features since all proposed features would be located on project fee title lands. The real estate is to be verified in the ***REAL ESTATE APPENDIX*** of the C-111 SC Western PIR. All recreation features would be compatible with the environmental goals and objectives of the proposed project, and would not detract from the environmental or socioeconomic benefits generated by the proposed project.

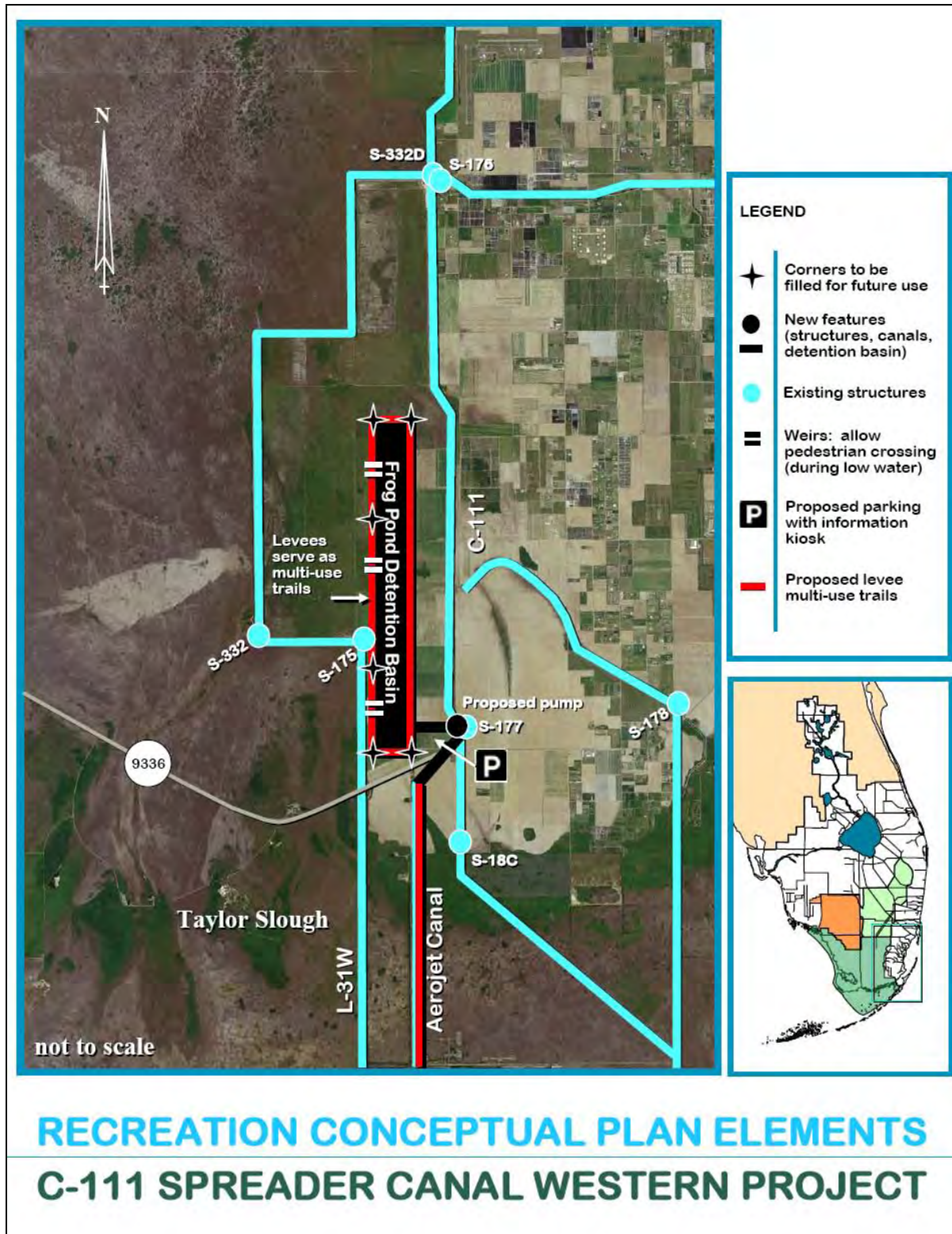


FIGURE H-1: C-111 SPREADER CANAL WESTERN PROJECT IMPLEMENTATION REPORT RECREATION CONCEPTUAL PLAN

H.2.2 Recreation Facilities Management Overview

The SFWMD would be responsible for 100 percent of the recreation operations, maintenance, repair, rehabilitation and replacement (OMRR&R) as outlined in the USACE *Planning Guidance Notebook* (Engineering Regulation [ER] 1105-2-100, Apr 2000, page E-286), the USACE/SFWMD *Design Agreement*, May 2000 and the USACE 29 Sept 2005 OMRR&R Memorandum.

Public access for passive recreation is planned for the proposed restoration project recreation component. Concerns have been expressed regarding the potential unlawful or ecologically harmful affects of passive use within this and other CERP projects. As a result, the SFWMD, through their rulemaking authority, has created Rule 40E-7 F.A.C. The Rule contains enforcement provisions for oversight by wildlife officers or other law enforcement officials to ensure that unlawful or ecologically harmful actions do not occur. The rule has general language applicable to all SFWMD owned lands and several special provisions for different types of land use including recreation. These rules allow the SFWMD to address hours of public access, the ability to allow or prohibit different activities in different areas or at different times, and the overall ability to close public access at any time there are emergencies, pending storms or routine operations and management needs or ongoing protection of the land.

H.3 BENEFIT CATEGORIES

H.3.1 Study Area Recreation Background

The proposed C-111 SC Western project recreation benefit analysis study area includes the counties of Miami-Dade, Broward and Monroe as outlined in the Florida SCORP (SCORP, 2000) Region 11. The SCORP is utilized to identify the recreation baseline for CERP recreation planning. Recreation deficits identified by the SCORP for this region include; bicycle riding, tent camping, hiking, hunting, freshwater beach activities, freshwater fishing and saltwater beach activities. A SCORP statewide needs assessment through 2010 identifies these deficits and the unit need for each recreation element (i.e., miles of trail, number of camp sites). The SCORP deficits for bicycle riding, hiking, freshwater fishing (non-boat) and hunting (managed) activities are considerations for the C-111 SC Western project recreation proposal.

The population growth of south Florida would only add to the calculated existing recreation deficits. The proposed recreation study also typically considers outside study influences from surveys and other documented and respected sources. Population projections per Census 2000 are presented in **TABLE H-1**.

H.3.2 Existing Recreation Resources

Existing recreational facilities within the SCORP Region 11 provide ideal recreation resources for linkages and bundling with the proposed C-111 SC Western project. Recreation facilities within the C-111 SC Western study area and three-county area include: the Biscayne National Park, Everglades National Park (ENP), Florida Keys National Marine Sanctuary, Crocodile Lake National Wildlife Refuge, five fish management areas, five wildlife management areas, 12 State of Florida greenways and trails projects, 15 State of Florida Parks, 32 Florida Communities Trust Sites and many State of Florida Artificial Reef Program 2000 local projects (SCORP, 2000). The Miami-Dade County website reports 189 parks in the county area (www.miamidade.gov/parks).

Recreation facilities within the more immediate C-111 SC Western project area include: ENP, Glen Garret Park, the Frog Pond Wildlife Management Area, Crocodile Lake National Wildlife Refuge, Canals L-30 and L-31 Fish Management Areas, Southern Glades Wildlife Management Area, A.D. Barnes Park, West Kendall District Park, in addition to approximately 50 other Miami-Dade County parks and greenways. Some of these facilities charge a park entrance fee but most are open to the public free of charge. Additionally, the Florida Fish and Wildlife Conservation Commission (FWC) provide five freshwater boatramps in Miami-Dade, four in Broward and none in Monroe County (www.myfwc.com). Additionally, parts of the C-111 SC Western project area include large tracts of lands managed by public agencies and private companies as parks and mitigation areas to the south and west of the study area.

TABLE H-1: STUDY AREA POPULATION THROUGH 2050 (1,000)

	2000	2010	2020	2030	2040	2050
Broward	1,623	1,931	2,257	2,562	2,745	2,947
% Change		0.91%	0.86%	0.95%	0.90%	0.90%
Miami-Dade	2,253	2,554	2,862	3,480	3,499	3,810
% Change		0.94%	0.89%	0.95%	0.91%	0.92%
Monroe	81	82	84	85.9	88	90
% Change		0.98%	0.97%	0.99%	0.97%	0.97%
Region Totals	3,957	4,567	5,203	6,128	6,332	6,847
Florida	15,982	18,866	21,792	24,528	27,118	29,714
Study Area % of Florida Population	24.7%	24.2%	23.8%	24.9%	23.3%	23.0%
United States	295,531	308,936	335,805	363,584	391,946	419,854
Study Area % of United States Population	1.43%	1.48%	1.54%	1.57%	1.61%	1.64%
Florida growth rate		8.90%	8.58%	9.44%	8.86%	8.98%
US growth rate		0.91%	0.83%	0.79%	0.78%	0.71%

Source: BEBR Projections, US Census (2000)

H.4 PROPOSED RECREATION

H.4.1 Trailhead Entrance and Parking

The main recreation component proposed for the C-111 SC Western project is the entrance trailhead and parking area which will be located at the construction staging area location for the proposed project. The staging area is tentatively planned for the southern area of the project Frog Pond Detention Area. Public access via the construction access road would be finalized once the construction access route is confirmed. The trailhead entrance road and parking would be on the north side of State Road 9336 (Ingraham Highway) between the L-31W Canal and the proposed Frog Pond Detention Area. The trailhead entrance and parking facilities would be in open view as the project lands are accessed from the highway via construction access route. The proposed recreation trailhead area would utilize the former project construction staging area for parking. General parking and paved handicapped parking to include a paved path to an information kiosk/shelter are proposed on the south side of the Cell S Impoundment area. A shade structure, shade trees, entrance gate and fencing would also be located in this area. Equestrian use would be staged in this area and would be allowed on the project lands but restricted on the levees.

The preliminary cost estimate for the entrance and perimeter canal recreation area is estimated at \$213,000 as shown in **TABLE H-2**.

TABLE H-2: TRAILHEAD ENTRANCE AND PARKING PROPOSAL COSTS

Feature	Quantity	Unit Cost	Total Cost
Shade Shelter 10' x 20'	1	\$33,000	\$33,000
Information Kiosk	1	\$23,000	\$23,000
Paved Handicapped Parking Area (includes path to shade shelter)	1 Unit	\$83,000	\$83,000
Park Security Gate	1 Unit	\$38,000	\$38,000
Fencing	Lump Sum	\$18,000	\$18,000
Landscaping (Trees)	Lump Sum	\$18,000	\$18,000
Entrance Trailhead Site Total			\$213,000

*USACE, Broward County Wildlife Preserve Area November 2006 and SFWMD provided costs.
USACE escalated to 2011

H.4.2 Multi-use Trails

Multi-Use Trails would be established on the Levees of the Frog Pond and Aerojet Canal Detention Areas. Public access to the proposed Multi-Use Trails would occur from the above-noted Parking Area. Specific details will be refined once project designs are finalized. Paving the levee crowns is not planned as light recreation uses of walking and biking are not envisioned to degrade the levee crown integrity. Bank fishing would be provided along the Aerojet Canal levees. The FPDA would not be of considerable depth to maintain fish populations for fishing activities. No costs are associated with the designated levee trails. OMRR&R costs would cover trash pickup, mowing and facility repair, rehabilitation and replacement.

H.5 RECREATION BENEFITS

H.5.1 National Perspective

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 method was selected for estimating recreation benefits for the C-111 SC Western project. When the unit day value 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 future with- and future without project framework of analysis, provides the estimate of recreation benefits.

The future without project condition analysis for the C-111 SC Western project does include some existing recreation value as lands within the project area provide access for biking, hiking, fishing, birdwatching and FWC managed hunts. The future with-project condition would add to this expected value of the recreational activity based on the unit day value method. **TABLE H-3** illustrates the method of assigning a point rating to a particular general recreation activity. The table 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-3: GUIDELINES FOR ASSIGNING POINTS FOR GENERAL RECREATION

Criteria	Judgment factors				
Recreation experience ¹ Total Points: 30 Point Value: 13	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 17-23	Numerous high quality value activities; some general activities 24-30
Availability of opportunity ⁴ Total Points: 18 Point Value: 6	Several within one hour travel time; a few within 30 minutes travel time 0-3	Several within one hour travel time; none within 30 minutes travel time 4-6	One or two within one hour travel time; none within 45 minutes travel time 7-10	None within one hour travel time 11-14	None within two hour 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: 11	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-3** above are based on Economic Guidance Memorandum (EGM) 09-03. The Criteria and Judgment Factors for General Recreation were used as the basis of the estimated point values for the proposed recreation area. Judgment factors were reviewed after conducting site visits and coordination with local agencies. The following selection factors were used for the criteria outlined in **TABLE H-3**.

- The C-111 SC Western project proposed recreation plan would provide an area specific, unique recreation opportunity afforded by the project setting and the project levees. The site offers solitude and panoramic views outside a growing metropolitan region, and would provide specific recreation amenities (as outlined in *TABLE H-3*) for an expanding regional and associated increasing recreation demands. 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 Miami-Dade County area.
- The availability of opportunity rating is based upon current local recreation facilities near the project area within the proposed recreation resource location. At the high end of the scale are those recreational facilities which are a geographical rarity; these are sites for which there is no close substitute within two hours. For example, two hours of drive time is sufficient for an east west transit across the lower part of Florida. For this study it is assumed that two hours is sufficient to travel approximately 80 miles (non-interstate travel). With the exception of jogging and walking activities and equestrian trails, alternative facilities exist for all other classifications. Scores for this judgment factor are therefore expected to be mid to low scale. With the exception of equestrian activity the proposed recreation resources will provide facilities needed to alleviate both current and projected SCORP Region 11 deficits in those activities.
- The proposed C-111 SC Western 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. Water resources and access to them for non-boat fishing, multi-use trail activities 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. A direct and paved road, Ingraham Highway, provides excellent access to the proposed recreation area.
- The environmental quality rating is based upon the existing aesthetic values of the proposed C-111 SC Western project recreation resource facilities, project lands, and the ease of correcting any limiting aesthetic factors. The proposed site would possess outstanding panoramic views,

with optimal views being from the C-111 SC levees of the FPDA and Aerojet Canal to the west during a sunset.

The value of a day of general recreation at the proposed C-111 SC Western project was determined for each project activity using the guidelines for Assigning Points for the General Recreation in **TABLE H-4**. The points were then converted to dollar values based on the EGM 09-03, Unit Day Values for Recreation, NOV 2008, which is based on ER 1105-2-100.

The Outdoor Recreation Coalition of America noticed the trend of walking and birdwatching increased 42 percent and 155 percent respectively from 1984 survey to the 1995 survey. The U.S. Fish and Wildlife Service (FWS), National Survey of Fishing, Hunting and Wildlife-Associated Recreation shows a 98 percent and 38 percent increase in residential and non-residential wildlife watching respectively in the State of Florida (Yellowbook, 1999). Overall, recreation trends show increased usage of existing facilities and a need to develop new facilities. With ensuing development in the project area, 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.

TABLE H-4 displays the point value conversion to a unit day values in fiscal year 2009 (FY09) dollar amount. The 46 points generated a user day value of \$7.27.

TABLE H-4: CONVERSION OF POINTS TO DOLLAR VALUES

General Recreation Point Values	General Recreation Dollar Values
0	\$3.52
10	4.26
20	4.71
30	5.39
40	6.73
50	7.63
60	8.30
70	8.75
80	9.65
90	10.32
100	10.77

H.5.2 State of Florida Perspective and Analysis

The State of Florida's Department of Environmental Protection, Division (FDEP) of Recreation and Parks developed the Florida SCORP for 2000. The SCORP was used to obtain state regional recreation participation rates. The SCORP provides recreation user day guidelines for resource based outdoor recreation activities listed in **TABLE H-5**. These guidelines are based on maximum carrying capacity levels developed by FDEP.

Using the guidelines available from the SCORP, reasonable user rate projections can be determined. Due to the rural project area location and rustic/minimal recreation features planned, it was determined that a conservative usage rate would be applied to the justification process. The projected C-111 SC Western project recreation use rates referenced the resource needs and guidelines published by the SCORP, but use rates developed were substantially lower than the SCORP published rates. It is expected that recreation use within the study area would be reduced during reservoir dry periods. The probability that only the two miles on either side of the access points will be used for the multi-use trail was factored into the recreation use scenario.

In many areas, even where water bodies are accessible, they are unusable due to the lack of facilities. As previously noted, the regional level needs assessments in this plan (SCORP) are not capable of identifying local needs. Nonetheless, it is well known that there is a need to fund development of access facilities such as kayak access, docks, catwalks and piers, as well as support facilities such as bathhouses, restrooms, and parking areas. Federal, state and local governments should work together to fund construction of these facilities in all areas where there is sufficient access to water bodies suitable for recreation (SCORP, 2000).

H.5.3 Regional Perspective and Analysis

The current SCORP indicates regional recreation demands not met for the year 2010 for four activities associated with the proposed C-111 SC Western recreation project. In the current or existing without project condition miles of hiking, biking, bank fishing and hunting are needed to fill projected regional demand. Analysis of supply and demand within Region 11 indicates that future demand for equestrian trails will overcome supply sometime between 2010 and 2015.

The use guidelines for designated bicycle, hiking, bank fishing, hunting and nature study were based on carrying capacity guidelines adopted by the SCORP and used by the state park system (**TABLE H-5**). The C-111 SC Western Storage Reservoir consists of approximately 6.8 miles of multi-use levee trails atop the impoundment cells and adjacent to the Aerojet Canal. A balanced mix of ecosystem compatible recreation use and facilities are proposed for the C-111

SC Western project. No restrooms are provided due to the high probability of vandalism and subsequent high OMRR&R costs. The proposed recreation would help to fill existing and projected SCORP 2000 recreation deficits for Region 11.

TABLE H-5: MOST LIKELY RECREATION PARTICIPATION USER DAY PROJECTION SCENARIO

Activity	Units Provided	SCORP Maximum Area Requirements	SCORP Turn over Rates	SCORP Capacity Guidelines	SCORP Region 11 Resource Needs (2010)		C-111 SC Projected Expected Users
					User Occasions	Units	
Bicycling	6.8 MI (4 utilized)	10-20 users per MI	4/day	40-80 users per MI per day	16,675,164	4 miles	10
Hiking	55.6 MI (4 utilized)	5-20 groups per MI	4/day	40-160 users per MI of trail/day	1,058,861	4 miles	10
Managed Hunting	667 AC	90 AC/ hunter	2/day	45 ACs/day	N/A	667 ac	5
Bank Fishing	500 LF of Bank	10 LF of bank per person	2/day	5 LF of bank user per day	1,678,705	500 LF	5
General Recreation Total							40 users per day

Key:

† = signifies conservative user rates developed between by the USACE and SFWMD recreation planning point of contacts after SCORP review

AC acres

LF linear feet

MI mile

H.6 ECONOMIC JUSTIFICATION OF RECREATION

The justification for incurring additional project costs for the inclusion of recreation features is derived by utilizing a benefit to cost ratio. The tangible economic justification of the proposed project can be found by comparing the equivalent average annual costs with the estimated equivalent average annual benefits, which would be realized over the period of analysis. These recreation benefits and costs are provided in **TABLE H-6**.

ER 1105-2-100 (The Planning Guidance Notebook) provides economic evaluation procedures to be used in all federal water resources planning studies. The ER guidelines were used in preparing this cost analysis. The federally mandated project evaluation interest rate of 4 1/8 percent, an economic period of analysis of 40 years and current prices were used to evaluate economic feasibility.

TABLE H-6: SUMMARY OF RECREATION COSTS AND BENEFITS

Investment Costs	
Recreation Construction Costs	\$213,000
PED & S/A (20%)	\$43,000
Total Recreation Construction	\$256,000
Construction Duration	12 months
Interest During Construction Costs	\$10,000
Total Recreation Investment	\$266,000
Average Annual Costs	
Interest and Amortization of Initial Investment	\$20,000
OMRR&R	\$25,000
Total Average Annual Costs	\$45,000
Average Annual Benefits	\$122,000
Net Annual Benefits	\$77,000
Benefit – Cost Ratio	2.7

Recreation Benefits reflect 2009 unit day values from EGM, 09-02

TABLE H-7: SENSITIVITY ANALYSIS USING MULTIPLE SCENARIOS

Scenario	Annual Users	Daily Users	Annual Benefit
Most Likely	16,425	46	\$86,000.00
Worst Case	5,110	15	\$39,803.00
SCORP Guidelines	19,412,730	53,185	\$141,129,056.00

A sensitivity analysis was performed to check expected benefits and provide additional justification for proposed recreation features. SCORP expected benefits are provided for comparison with the proposed C-111 SC Western project recreation benefits. This economic analysis suggests there would be ample benefits to conservatively justify the proposed recreation facility construction for the C-111 SC Western project.

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