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# ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE CAPE SABLE SEASIDE SPARROW

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prepared for:

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## ACRONYM LIST

| | |
|---|---|
| BCNP | Big Cypress National Preserve |
| C-111 | Canal 111 |
| C&SF | Central and South Florida project |
| CERP | Comprehensive Everglades Restoration Plan |
| CSOP | Combined Structural and Operational Plan |
| ENP | Everglades National Park |
| FWC | Florida Fish and Wildlife Conservation Commission |
| HCP | Habitat Conservation Plan |
| IOP | Interim Operational Plan |
| ISOP | Interim Structural and Operation Plan |
| MRA | Miccosukee Reserved Area |
| MSRP | South Florida Multi-Species Recovery Plan |
| NEPA | National Environmental Policy Act |
| NPS | National Park Service |
| OMB | Office of Management and Budget |
| ORV | Off-road vehicles |
| RFA | Regulatory Flexibility Act |
| ROD | Record of Decision |
| SBREFA | Small Business Regulatory Enforcement Fairness Act |
| Service | U.S. Fish and Wildlife Service |
| SFWMD | South Florida Water Management District |
| sparrow | Cape Sable seaside sparrow |
| USACE | U.S. Army Corps of Engineers |
| WCA | Water Conservation Area |

# EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the Cape Sable seaside sparrow (sparrow).

2. In 1967, the sparrow was determined to be threatened with extinction.[1] Its protected status continued with the adoption of the Endangered Species Act of 1973, as amended. Critical habitat was designated for the endangered sparrow in 1977.[2] The 1977 critical habitat designation consisted of approximately 197,444 acres within Everglades National Park (ENP), Southern Glades Wildlife and Environmental Area, and on adjacent private land (at the time of designation).

3. On October 31, 2006, the Service published a proposed critical habitat revision for the sparrow.[3] The Service proposed 156,350 acres spread across seven units within Miami-Dade and Monroe Counties, Florida. Exhibit ES-1 is a map of the proposed critical habitat Units. All land is in public ownership. Approximately 94 percent falls within ENP and Big Cypress National Preserve (BCNP), both of which are managed by the National Park Service (NPS). The remaining six percent is within the Southern Glades Wildlife and Environmental Area, jointly managed by the South Florida Water Management District (SFWMD) and the Florida Fish and Wildlife Conservation Commission (FWC).

4. The key to capturing the potential economic impacts of conservation efforts for the sparrow within the proposed critical habitat designation is understanding relevant provisions of overall Everglades restoration. While the goal of stakeholders at all levels is restoration of the Everglades, there are varying perspectives, competing needs, and complex constraints on the ecosystem, and on the water operations and management in the region. These demands include providing water supply and flood control services to populated areas, along with providing sufficient water flows to ENP and to areas traditionally or historically used by various groups. The proposed rule identifies as one of four primary constituent elements a hydrologic characteristic that is consistent with maintaining sparrow nesting habitat. The sparrow depends on the same hydrologic management that governs water throughout South Florida, and thus introduces a need for

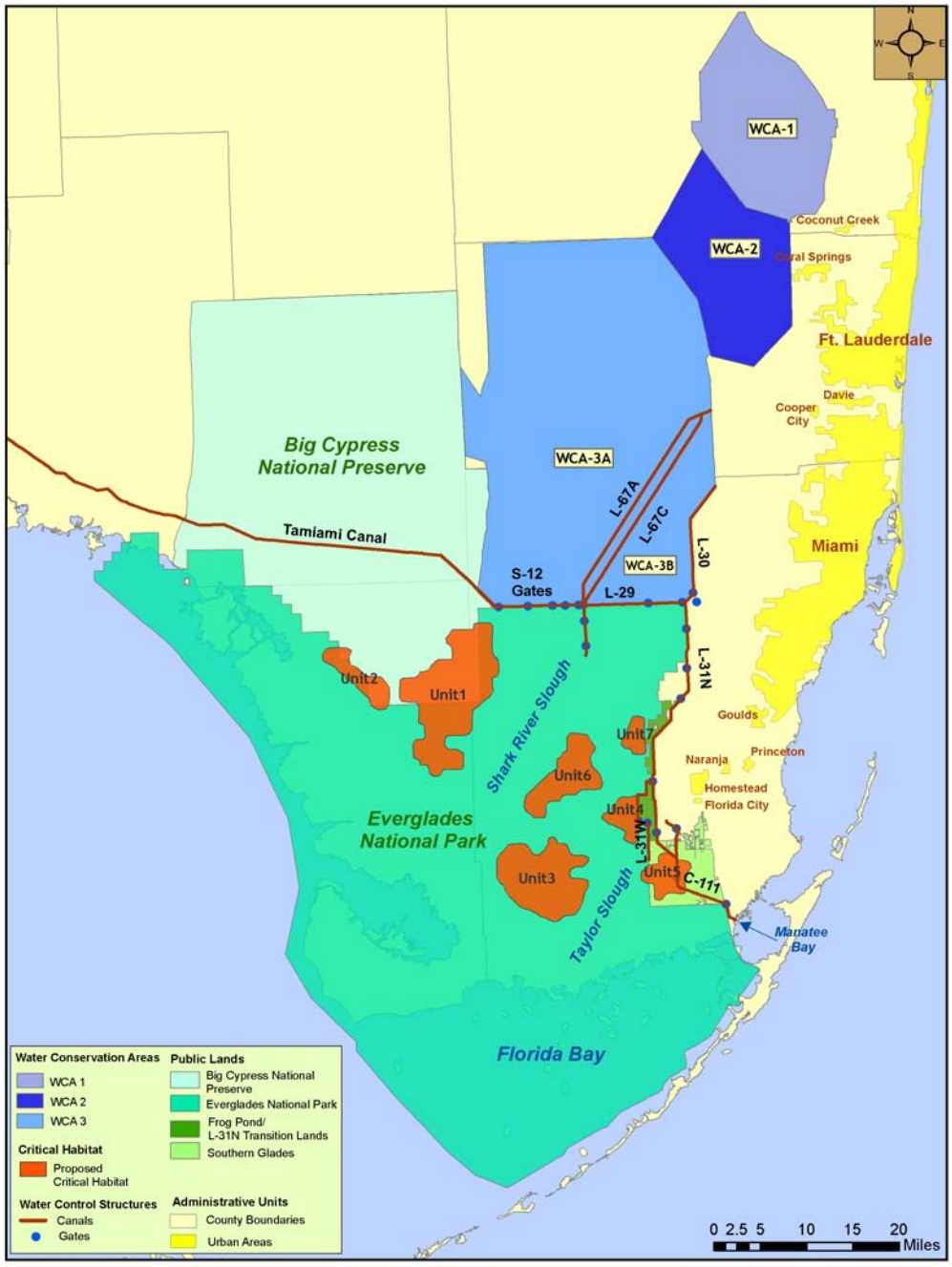
[1] U.S. Fish and Wildlife Service, Species Threatened with Extinction, 32 FR 4001, March 11, 1967.

[2] U.S. Fish and Wildlife Service, Final Critical Habitat Designation for the Indiana Bat, Morro Bay Kangaroo Bat, Florida Manatee, California Condor, Florida Everglade Kite, American Peregrine Falcon, Palila, Yellow Shoulderband Blackbird, Dusky Seaside Sparrow, Cape Sable Seaside Sparrow, American Crocodile, St. Croix Ground Lizard, Giant Anole, Snail Darter, Slender Chub, Spotfin Chub, Slackwater Darter, and Yellowfin Madtom, 42 FR 47840, September 22, 1977.

[3] U.S. Fish and Wildlife Service, Proposed Critical Habitat Designation for the Cape Sable Seaside Sparrow, 71 FR 63980, October 31, 2006.

additional consideration in water management decisions. The Key Findings of the analysis are highlighted below.

**EXHIBIT ES-1 PROPOSED CRITICAL HABITAT FOR THE CAPE SABLE SEASIDE SPARROW**



**KEY FINDINGS**

**Potential Future Impacts:** This draft economic analysis estimates potential future costs associated with conservation efforts for the sparrow in areas proposed for designation to be $32.2 million over the next 20 years (undiscounted). The present value of these impacts is $26.9 million, using a discount rate of three percent, or $22.2 million, using a discount rate of seven percent. The annualized value of these impacts is $1.8 million, using a discount rate of three percent, or $2.1 million, using a discount rate of seven percent.

**Quantified Impacts:** The majority, or 58 percent, of the total potential costs estimated in this report are associated with potential species management efforts (e.g., surveying and monitoring, research, exotic vegetation control etc.). The remaining costs are associated with potential water management changes to conserve the sparrow (33 percent), fire management (seven percent) and administrative costs of consultation (two percent).

- Species Management: This analysis estimates the cost of species management efforts undertaken for the sparrow to be $15.7 million over the next 20 years (discounted at three percent). Landowners and managers including NPS and FWC, which are responsible for managing the natural resources within Everglades National Park and Big Cypress National Preserve, and Southern Glades Wildlife and Environmental Area, respectively, are expected to undertake species management efforts, including surveying and monitoring, research, and exotic vegetation control.

- Water Management: The prospective cost of the potential changes in water management for the conservation of the sparrow are estimated to be $8.8 million. These costs are associated with sparrow conservation efforts anticipated to be undertaken by the U.S. Army Corps of Engineers (USACE) associated with management plans developed prior to the revision of critical habitat. Note, approximately $28.1 million in capital and operational costs have been incurred since 2000 by the USACE for sparrow water management.
  Beginning with the full implementation of the next phase of Everglades Restoration projects (i.e., the Combined Structural and Operational Plan (CSOP) for the Everglades, and the Comprehensive Everglades Restoration Plan (CERP)), assumed for purposes of this analysis to begin around 2011, it is uncertain whether incremental conservation measures implemented for sparrow conservation will represent a constraint on overall water management activities. For example, it may be possible that overall Everglades restoration and sparrow conservation efforts become more harmonized, thus diminishing related economic impacts. Nevertheless, given the current uncertainty concerning overall CERP implementation, no long-term impacts on water management from sparrow conservation are quantified beyond 2011.

- Fire Management: Fire management efforts to be undertaken for the conservation off the sparrow by NPS within ENP are estimated to be $1.9 million. These efforts include fire suppression and planning.

**Critical Habitat Unit with Greatest Impacts:** The unit with the highest potential impacts (discounted at three percent) is Unit 1, Subpopulation A Marl Prairies ($11.2 million). Most of the forecast costs in this unit, or 79 percent, are attributed to the ongoing changes in water management to provide sparrow nesting habitat.

*Unless otherwise noted the Executive Summary provides estimates of costs using a discount rate of three percent.

## BACKGROUND

5. No major conservation efforts for the sparrow occurred prior to 1994 apart from general species management efforts. However, as water management by the U.S. Army Corps of Engineers (USACE) began to focus on Everglades restoration, concerns about negative impacts to the sparrow began to surface.

6. In 1984, Congress authorized the USACE to begin a program of experimental water deliveries to the Everglades with the goal of restoring a more natural flow of water through the region. The Experimental Program consisted primarily of changes in the operation of current water management facilities, referred to as test iterations. The

Service determined that test iterations one through six would have limited effects on the sparrow. In 1993, an observed decline in Subpopulation A (Units 1 and 2) precipitated action by the Service to minimize the effects of water management activities under test iteration seven, and marked the beginning of a series of management modifications for the protection of the sparrow. In response to a 1999 Service jeopardy biological opinion on a proposed hydrologic management regime, measures were implemented to reduce the flow of water into the area of sparrow Subpopulation A during the nesting season. This was achieved primarily by closing the S-12 structures upstream of the subpopulation.

7. While a variety of perspectives exist on how water management is linked to and affected by sparrow conservation, certain projects have been undertaken expressly for conservation of the sparrow. The Interim Operational Plan (IOP) is the current plan that is in place until a more comprehensive and permanent management plan is developed to replace it. A series of USACE water management plans and projects, and the Service's findings on their effects on the sparrow led to development of the IOP. These plans and projects include the Modified Water Deliveries, the Canal-111 (C-111) projects, and the Experimental Program. Overall, the Modified Water Deliveries and C-111 projects comprise the structural components of efforts to improve water management in the Everglades. They were developed as additions and modifications to the C&SF Project. The Experimental Program tests a variety of operational scenarios, using structural elements of both Modified Water Deliveries and C-111. Thus, the three are closely interrelated.

8. The IOP plan was completed and a Record of Decision (ROD) was signed in 2002, after several years of planning and two years of temporary operations (termed Interim Structural and operational Plans – ISOP 2000 and 2001). IOP operations were implemented in 2002, and construction of IOP features has continued through the present.

9. The IOP includes both structural and operational components. The structural components are primarily detention pond areas and pumps, while the operational component is a marsh-driven plan for management of the structural components. The net effect of the IOP operations is to lessen the quantity of water near Subpopulation A during the sparrow nesting season, and provide more water to the sparrow populations on the east side of ENP by routing water around ENP with usage of new temporary pumps to both maintain flood control levels in the canals, and allow seepage into Taylor Slough through the new detention ponds. In addition, it contains rules to maintain flood protection for areas east of ENP. The economic analysis estimates the total present value of past capital and operational costs of implementing IOP incurred by USACE were $28.1 million (discounted at three percent). As long as it is in place, IOP will continue to engender a stream of ongoing operational costs, the present value of these costs is estimated in the prospective analysis to be $8.8 million (discounted at three percent).

10. The IOP will be in place until full implementation of the Combined Structural and Operational Plan (CSOP). CSOP, currently in development by USACE, is intended to define the operations for the Modified Water Deliveries and C-111 projects combining their original purposes and the various management changes adopted since their origination. While the currently expected Record of Decision date for CSOP is 2008, it

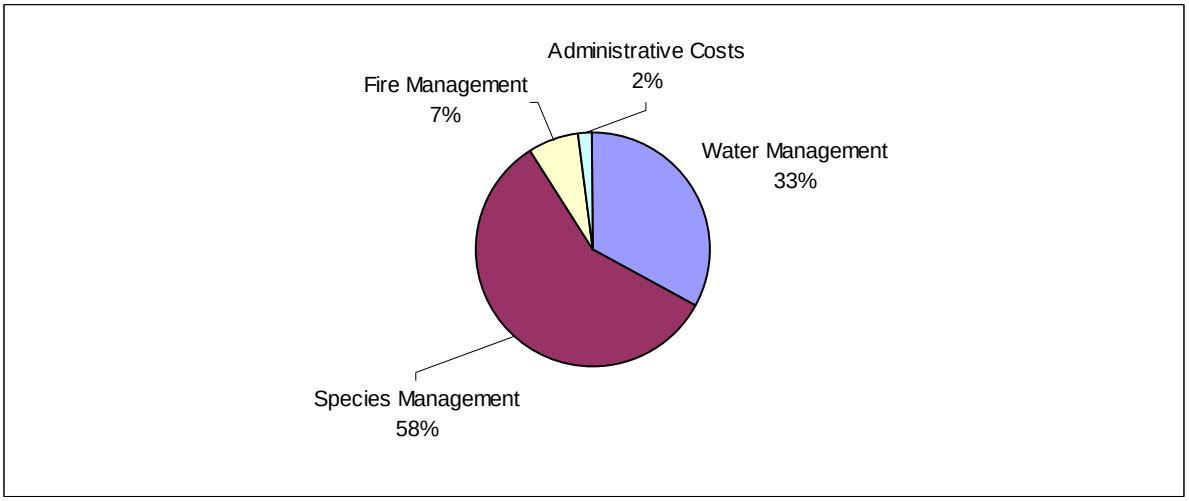
will not be fully implemented until the Tamiami Trail portions of the Modified Water Deliveries project are completed, expected in 2010 or 2011. Given the complexity of the management options and constraints in the Everglades, and the public nature of the process, the timing of CSOP design and implementation remains uncertain. The implementation of CERP and CSOP are expected to begin to harmonize the various management options and constraints for the overall goal of restoring the Everglades. However, there are numerous tradeoffs currently, and potentially in the future related to sparrow management.

11. Exhibits ES-2 and ES-3 summarize the results of this analysis by activity. The relative magnitude of impacts to each unit are shown in Exhibits ES-4 and ES-5. Exhibit ES-4 ranks the units proposed for critical habitat designation in order of the magnitude of potential impact (discounted at three percent). Exhibit ES-5 presents more detailed information regarding present value and annualized impacts in each unit. Exhibit ES-6 presents total cost by unit and activity type, discounted at three percent. Exhibit ES-7 qualitatively presents the potential ecological and economic impacts of sparrow conservation efforts related to water management actions.

**EXHIBIT ES-2 SUMMARY OF POTENTIAL IMPACTS BY ACTIVITY (2007-2026)**

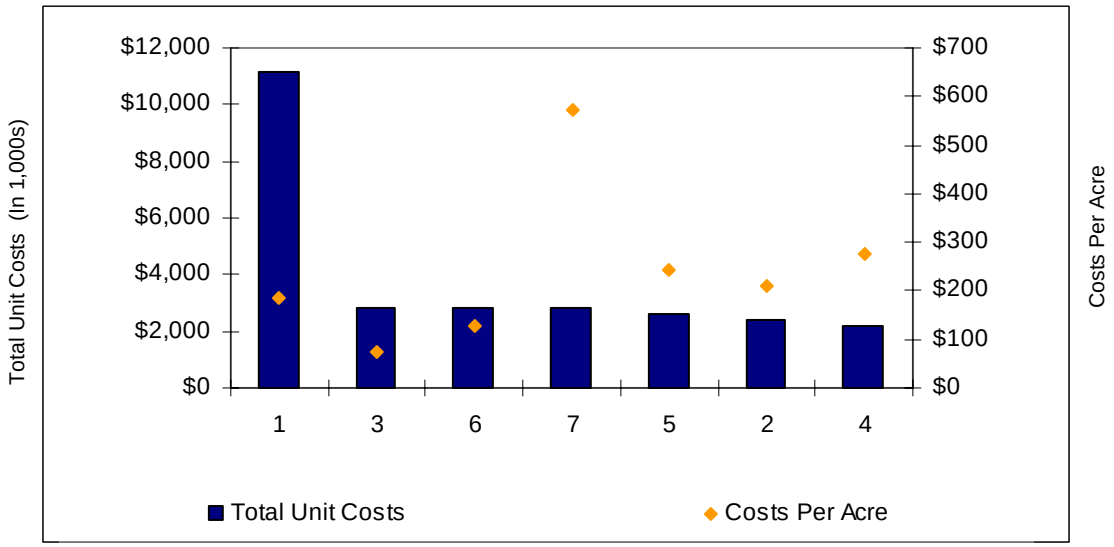
| ACTIVITY | | PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|
| | UNDISCOUNTED | (3%) | (7%) | (3%) | (7%) |
| Water Management | $9,210,000 | $8,810,000 | $8,340,000 | $592,000 | $788,000 |
| Species Management | $19,900,000 | $15,700,000 | $12,100,000 | $1,060,000 | $1,150,000 |
| Fire Management | $2,420,000 | $1,850,000 | $1,370,000 | $125,000 | $129,000 |
| Administrative Costs | $658,000 | $487,000 | $349,000 | $32,700 | $33,000 |
| **Total** | **$32,200,000** | **$26,900,000** | **$22,200,000** | **$1,810,000** | **$2,100,000** |
| Note: Water management impacts not quantified beyond 2011. | | | | | |

## EXHIBIT ES-3 POTENTIAL IMPACTS BY ACTIVITY (DISCOUNTED AT THREE PERCENT)




Source: IEc analysis
Note: The relative proportion of impact by activity does not change significantly applying other discount rates. Water management impacts are not quantified beyond 2011.

## EXHIBIT ES-4 RANKING OF POTENTIAL IMPACTS BY UNIT (DISCOUNTED AT THREE PERCENT, 2007-2026)




Source: IEc analysis. Note: Water management impacts not quantified beyond 2011.

### SMALL BUSINESS ANALYSIS

12. Appendix B of this analysis includes a screening level analysis to determine the possible effects of conservation efforts for the sparrow on small entities. The screening level analysis is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA). The screening analysis concludes that the small businesses are unlikely to experience impacts associated with sparrow conservation efforts.

**EXHIBIT ES-5 POTENTIAL IMPACTS BY UNIT (2007 - 2026)**

| UNIT | | PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|
| | UNDISCOUNTED | (3%) | (7%) | (3%) | (7%) |
| 1: Subpopulation A Marl Prairies | $12,200,000 | $11,200,000 | $10,200,000 | $752,000 | $963,000 |
| 2: Subpopulation A Cordgrass Marshes | $2,980,000 | $2,370,000 | $1,850,000 | $159,000 | $175,000 |
| 3: Subpopulation B | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| 4: Subpopulation C | $2,830,000 | $2,220,000 | $1,700,000 | $149,000 | $161,000 |
| 5: Subpopulation D | $3,310,000 | $2,590,000 | $1,970,000 | $174,000 | $186,000 |
| 6: Subpopulation E | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| 7: Subpopulation F | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| **Total** | **$32,200,000** | **$26,900,000** | **$22,200,000** | **$1,810,000** | **$2,100,000** |

Note: Totals may not add due to rounding. Water management impacts not quantified beyond 2011.

**EXHIBIT ES-6 POTENTIAL IMPACTS BY ACTIVITY AND UNIT (DISCOUNTED AT THREE PERCENT 2007 - 2026)**

| UNIT | WATER MANAGEMENT | SPECIES MANAGEMENT | FIRE MANAGEMENT | ADMINISTRATIVE COSTS | TOTAL |
|---|---|---|---|---|---|
| 1: Subpopulation A Marl Prairies | $8,810,000 | $2,300,000 | $0 | $68,000 | $11,200,000 |
| 2: Subpopulation A Cordgrass Marshes | $0 | $2,300,000 | $0 | $68,000 | $2,370,000 |
| 3: Subpopulation B | $0 | $2,150,000 | $618,000 | $68,000 | $2,840,000 |
| 4: Subpopulation C | $0 | $2,150,000 | $0 | $68,000 | $2,220,000 |
| 5: Subpopulation D | $0 | $2,510,000 | $0 | $79,000 | $2,590,000 |
| 6: Subpopulation E | $0 | $2,150,000 | $618,000 | $68,000 | $2,840,000 |
| 7: Subpopulation F | $0 | $2,150,000 | $618,000 | $68,000 | $2,840,000 |
| **Total** | **$8,810,000** | **$15,700,000** | **$1,850,000** | **$487,000** | **$26,900,000** |

Note: Totals may not add due to rounding. Water management impacts not quantified beyond 2011.

## EXHIBIT ES-7 POTENTIAL ECOLOGICAL AND ECONOMIC IMPACTS RELATED TO SPARROW CONSERVATION EFFORTS

| WATER MANAGEMENT ACTION | POTENTIAL ECOLOGICAL IMPACTS | POTENTIAL ECONOMIC IMPACTS |
|---|---|---|
| Closure of S-12 structures | • Subpopulation A (Units 1 and 2) may experience drier (i.e., better) hydrological conditions for sparrow nesting and habitat maintenance.<br>• Degradation and loss of tree-islands due to higher water levels in WCA-3A.<br>• Injury and jeopardy to endangered and threatened species in WCA-3A.<br>• Minor to moderate changes in salinity levels in St. Lucie and Caloosahatchee estuaries and some estuaries in Florida Bay.<br>• Delay in implementation of MWD and therefore delay and possible permanent change in original objectives of the Everglades ecosystem restoration plans. | • USACE incurs costs due to additional planning efforts, and day-to-day operational changes.<br>• Reduction in recreational opportunities in WCA-3A due to access restrictions during high water levels in WCA-3A.<br>• Reduced access to areas considered as cultural heritage by the Miccosukee Tribe due to higher water levels in the WCA-3A.<br>• Negative impact on recreational and commercial fishing opportunities in St. Lucie and Caloosahatchee estuaries and some estuaries in Florida Bay. |
| Re-routing of water along the eastern edge of ENP through the SDCS | • Subpopulations C and F (Units 4 and 7) may experience more natural (i.e., wetter) hydrological conditions.<br>• Flow in Upper Taylor Slough approaches more natural levels.<br>• Increased hydroperiods in northeastern Shark River Slough may improve vegetation in some wetland areas and nesting and foraging habitat for some wildlife species.[4] | • USACE incurs costs due to additional planning efforts, new or expedited construction features, and day-to-day operational changes.<br>• Increased risk of flooding in agricultural areas in southern Miami-Dade county due to higher water levels in L-31N canal. |

[4] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp.; pp. 64, 67.

# SECTION 1 | INTRODUCTION AND FRAMEWORK FOR ANALYSIS

## 1.1 PURPOSE OF THE ECONOMIC ANALYSIS

13. The purpose of this report is to estimate the economic impact of actions taken to protect the Cape Sable seaside sparrow (sparrow). The report attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely affect the habitat within the proposed critical habitat boundaries. The analysis looks retrospectively at costs incurred in the past, and it attempts to predict future costs likely to occur after the 2006 proposed critical habitat designation is finalized.

14. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.[5] In addition, this information allows the U.S. Fish and Wildlife Service (the Service) to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[6] This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.[7]

15. This section provides background information on the species and the proposed designation. Next, it describes the regulatory alternatives considered by the Service. Then, it describes the approach to estimating impacts and lays out the scope of the analysis. Information sources relied upon are summarized in the next section. The section concludes with a description of the organization of the remainder of this report.

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[5] 16 U.S.C. §1533(b)(2).

[6] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993; Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001; 5. U.S.C. §§601 *et seq*; and Pub Law No. 104-121.

[7] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

## 1.2 BACKGROUND[8]

### 1.2.1 REGULATORY HISTORY

16. In 1967, the sparrow was determined to be threatened with extinction. Its protected status continued with the adoption of the Endangered Species Act of 1973, as amended. Critical habitat was designated for the endangered sparrow in 1977. In 1983, a recovery plan was completed for the sparrow. In 1999, a revised recovery plan (the South Florida Multi-species Recovery plan [MSRP]) was completed. On October 31, 2006, the Service published a proposed rule to revise critical habitat for the sparrow, and the Service is required to publish a final rule within 12 months of the publication of the proposed rule. For a description of the sparrow and the primary constituent elements that are essential to the conservation of the species, refer to the proposed rule.

### 1.2.2 PROPOSED CRITICAL HABITAT

17. The Service proposes 156,350 acres divided into seven Units within Miami-Dade and Monroe Counties, Florida. Exhibit 1-1 is a map of the proposed critical habitat Units. Exhibit 1-2 lists the landownership in proposed critical habitat. As shown, all land is in public ownership. Approximately 94 percent falls within Everglades National Park (ENP) and Big Cypress National Preserve (BCNP) managed by the National Park Service (NPS). The remaining six percent is within the Southern Glades Wildlife and Environmental Area jointly managed by the South Florida Water Management District (SFWMD) and the Florida Fish and Wildlife Conservation Commission (FWC).

[8] U.S. Fish and Wildlife Service, Proposed Critical Habitat Designation for the Cape Sable Seaside Sparrow, 71 FR 63980, October 31, 2006.

## EXHIBIT 1-1 MAP OF PROPOSED CRITICAL HABITAT UNITS FOR THE CAPE SABLE SEASIDE SPARROW

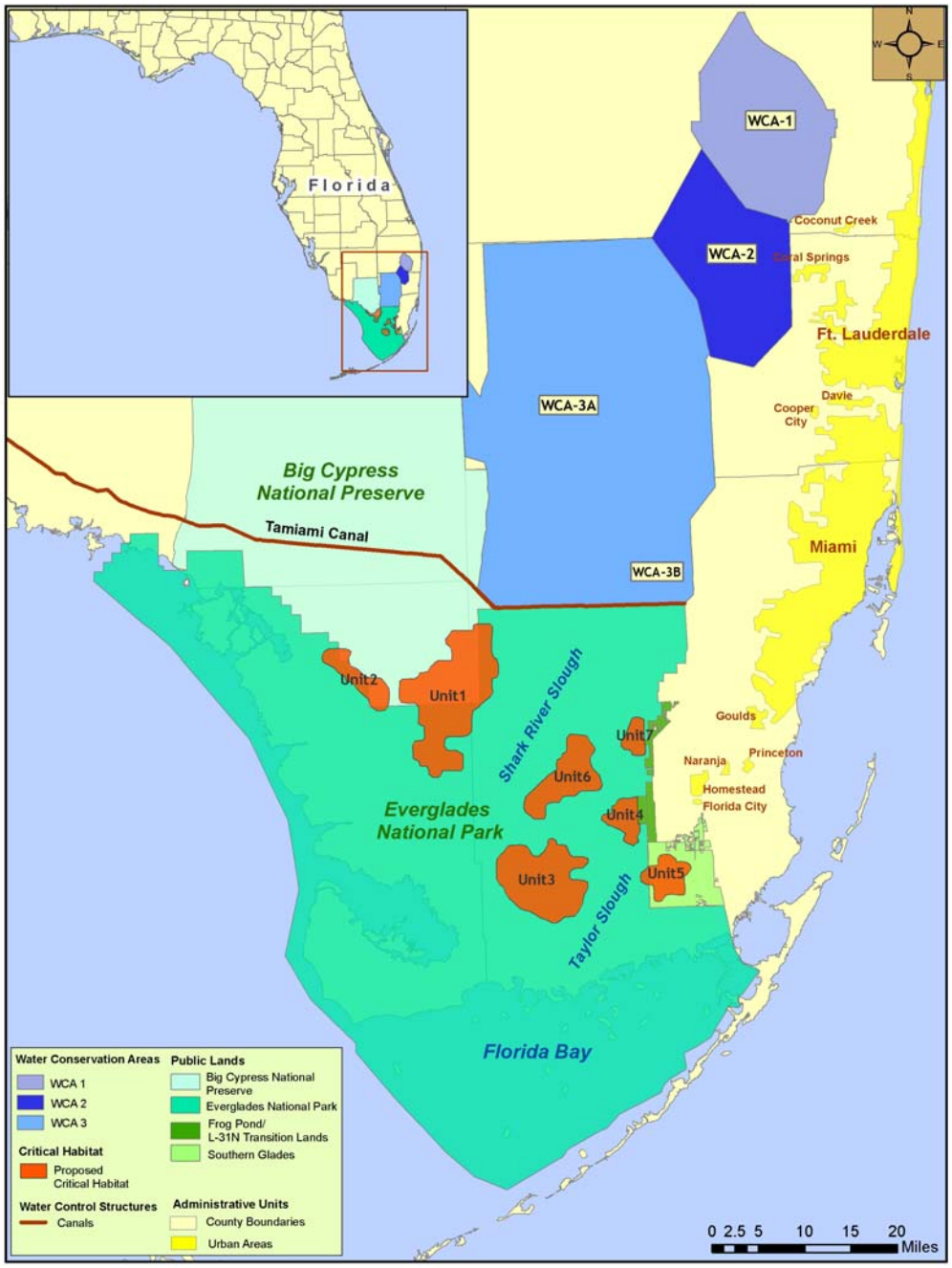

**EXHIBIT 1-2 SUMMARY OF LANDOWNERS AND ACREAGES FOR CAPE SABLE SEASIDE SPARROW PROPOSED CRITICAL HABITAT**

| UNIT | EVERGLADES NATIONAL PARK | BIG CYPRESS NATIONAL PRESERVE | SOUTHERN GLADES WILDLIFE AND ENVIRONMENTAL AREA | TOTAL |
|---|---|---|---|---|
| 1: Subpopulation A Marl Prairies | 31,292 | 28,600 | 0 | 59,842 |
| 2: Subpopulation A Cordgrass Marshes | 5,398 | 6,004 | 0 | 11,402 |
| 3: Subpopulation B | 39,053 | 0 | 0 | 39,053 |
| 4: Subpopulation C | 8,059 | 0 | 0 | 8,059 |
| 5: Subpopulation D | 833 | 0 | 9,867 | 10,700 |
| 6: Subpopulation E | 22,278 | 0 | 0 | 22,278 |
| 7: Subpopulation F | 4,958 | 0 | 0 | 4,958 |
| **Total** | **111,871** | **34,604** | **9,867** | **156,342** |

## 1.3 REGULATORY ALTERNATIVES

18. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. The Service identifies seven units of proposed critical habitat for the sparrow. Alternatives to the proposed rule are possible through section 4(b)(2) of the Act. Section 4(b)(2) allows the Service to exclude areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at a unit level may result in alternate combinations of units of proposed habitat that may or may not ultimately be designated. As a result, the impacts of multiple combinations of units are available for consideration by the Service.

## 1.4 THREATS TO THE SPECIES AND HABITAT

19. The Service has identified water management actions, fire, and invasive exotic plant species as threats to the sparrow. The main concern for the sparrow and its habitat is maintaining hydrologic conditions for the sparrow, specifically actions taken by the U.S. Army Corps of Engineers (USACE) and SFWMD to meet water quantity, quality, timing, and distribution requirements. Thus, this analysis will focus on accurately capturing this category of impact.

## 1.5 APPROACH TO ESTIMATING ECONOMIC EFFECTS

20. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the sparrow and its habitat (hereinafter referred to collectively as "sparrow conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly,

the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of sparrow conservation efforts.

21. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of sparrow conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a relatively small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

### 1.5.1 EFFICIENCY EFFECTS

22. At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect sparrow habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.[9]

23. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal landowner or manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been species' habitat. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

24. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

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[9] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., *A Guide to Benefit-Cost Analysis (2nd Ed.)*, Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, September 2000, available at http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html.

25. This analysis begins by measuring costs associated with measures taken to protect the sparrow and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation efforts is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets.

### 1.5.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

26. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.[10] This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

#### 1.5.2.1 Impacts on Small Entities and Energy Supply, Distribution, and Use

27. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future sparrow conservation efforts.[11] In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.[12]

#### 1.5.2.2 Regional Economic Effects

28. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreationists) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

29. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change.

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[10] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[11] 5 U.S.C. § 601 *et seq.*

[12] Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001.

Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

30. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

## 1.6 SCOPE OF THE ANALYSIS

31. This analysis identifies those economic activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries of the proposed critical habitat designation. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be co-extensive with the designation.[13,14]

32. Coextensive effects may also include impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. In past instances, some of these measures have been precipitated by the listing of the species and impending designation of critical habitat. Because habitat conservation efforts affording protection to a listed species likely contribute to the efficacy of the critical habitat designation efforts, the impacts of these actions are considered relevant for understanding the full effect of the proposed critical habitat designation. Enforcement actions taken in response to violations of the Act, however, are not included.

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[13] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Assn v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

[14] In 2004, the U.S. Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat (*Gifford Pinchot Task Force v. United States Fish and Wildlife Service*). The Service is currently reviewing the decision to determine what effect it (and to a limited extent Center for Biological Diversity v. Bureau of Land Management (422F.Supp.2d 1115 (N.D. Cal. 2006)) may have on the outcome of consultations pursuant to section 7 of the Act.

**CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS**

For each land use activity, this analysis compares economic impacts incurred in different time periods in present value terms. The present value presents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of sparrow conservation efforts; and b) the specific years in which these impacts have or are expected to be incurred. With these data, the present value of the past or future stream of impacts ($PV_c$) of sparrow conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2007}}$$

$C_t$ = forecast cost of sparrow conservation efforts in year t

r = discount rate[b]

Impacts of conservation efforts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, however, all activities employ a forecast period of 20 years, 2007 through 2026. Annualized impacts of future sparrow conservation efforts ($APV_c$) are calculated by the following standard formula:

$$APV_c = PV_c \left[ \frac{r}{1-(1+r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, 20 years)

[a] To derive the present value of past conservation efforts for this analysis, t is 1967 and T is 2007; to derive the present value of future conservation efforts, t is 2007 and T is 2026.

[b] To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, Feb. 3, 2003.)

### 1.6.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

33. This analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as the critical habitat designation. In this section, the Secretary is required to list species as endangered or threatened "solely on the basis of the best available scientific and commercial data."[15] Section 4 also requires the Secretary to designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat."[16] In addition, under section 4, the Service is required to develop a recovery plan that recommends actions necessary to satisfy the biological needs and assure the recovery of the species. The plan serves as guidance for interested parties, including Federal, State, and local agencies, private landowners, and the general public.

34. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:

- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and critical habitat designation.[17]
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to " harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[18] The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (i.e., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for an endangered animal species in order to meet the conditions for issuance of an incidental take

[15] 16 U.S.C. 1533.

[16] 16 U.S.C. 1533.

[17] The Service notes that the Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, invalidated the Service's regulation defining destruction or adverse modification of critical habitat. The Service is currently reviewing the decision to determine what effect it (and to a limited extent *Center for Biological Diversity v. Bureau of Land Management* (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

[18] 16 U.S.C. 1533.

permit in connection with the development and management of a property.[19] The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs.

### 1.6.2 OTHER RELEVANT PROTECTION EFFORTS

35. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. For the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

### 1.6.3 ADDITIONAL ANALYTIC CONSIDERATIONS

36. This analysis also considers the potential for other types of economic impacts that can be related to section 7 consultations in general and critical habitat designation in particular, including time delay, regulatory uncertainty, and stigma impacts.

#### 1.6.3.1 Time Delay and Regulatory Uncertainty Impacts

37. Time delays are costs due to project delays associated with the consultation process or compliance with other regulations. Regulatory uncertainty costs occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand their responsibilities with regard to critical habitat designation).

#### 1.6.3.2 Stigma Impacts

38. Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as "stigma" impacts.

### 1.6.4 BENEFITS

39. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[20] OMB's Circular A-4 distinguishes two types of economic benefits: direct *benefits and ancillary benefits.*

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[19] U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at http://endangered.fws.gov/hcp/.

[20] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.[21]

40. In the context of critical habitat designation, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.[22] *Rather than rely on economic measures, the Service believes that the direct benefits of the Proposed Rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

41. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications. For example, increased water flows for sparrow along the eastern edge of ENP may enhance Everglades restoration in this area. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

42. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if flows used to conserve the species habitat lead to an increase in recreational opportunities in the Everglades, the local economy may experience an associated measurable, positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

### 1.6.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

43. The geographic scope of the analysis includes areas proposed for critical habitat designation. The analysis focuses on activities within or affecting these areas. Impacts are presented at the finest level of resolution feasible, given available data. For this

[21] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[22] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

proposed critical habitat designation, impacts are reported for each of the seven Units identified in the proposed rule.

## 1.7 ANALYTIC TIME FRAME

44. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis will summarize costs associated with past species conservation efforts for the sparrow and then forecast projected future impacts for the 20 year period from 2007 (the year of the species' final critical habitat designation) to 2026. Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

## 1.8 INFORMATION SOURCES

45. The primary sources of information for this report were communications with and data provided by personnel from the Service, Federal action agencies, affected private parties, and local and State governments within Florida. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- U.S. Army Corps of Engineers;
- U.S. Fish and Wildlife Service;
- National Park Service;
- Miccosukee Tribe of Indians of Florida;
- State and intergovernmental agencies:
    - South Florida Water Management District
    - Florida Fish and Wildlife Conservation Commission

In addition, this analysis relies upon the Service's section 7 consultation records, public comments, and published journal sources. The reference section at the end of this document provides a full list of information sources.

## 1.9 STRUCTURE OF REPORT

46. The remainder of this report is organized as follows:

- Section 2: Everglades Restoration;
- Section 3: Potential Economic Impacts of Changes in Water Management for the Sparrow in the Everglades;
- Section 4: Economic Impacts to Other Activities;
- References;
- Appendix A: Administrative Costs;

- Appendix B: Small Business Impacts and Energy Impacts Analysis; and
- Appendix C: Detailed Impacts by Activity.

# SECTION 2 | EVERGLADES RESTORATION

## 2.1 INTRODUCTION

47. This section presents information on Everglades management and restoration as it relates to the sparrow. While the goal of stakeholders at all levels is restoration of the Everglades, there are varying perspectives, competing needs, and complex constraints on the ecosystem, and on the water operations and management in the region. These demands include providing water supply and flood control services to populated areas, along with providing sufficient water flows to Everglades National Park (ENP) and to areas traditionally or historically used by various groups.[23] The proposed rule identifies a hydrologic regime that would prevent flooding of sparrow nests, and generally maintain hospitable conditions for the sparrow as a primary constituent element of its habitat.[24] The sparrow depends on the same hydrologic management that governs water throughout South Florida, and thus introduces a need for additional consideration in water management decisions.

48. The major elements of the currently operating water infrastructure include three water conservation areas (WCA) north of ENP. They are separated from ENP by the Tamiami Trail and canal. Some water in the Tamiami canal is routed through additional pumps and structures around the eastern side of ENP and ultimately into Taylor Slough and Manatee Bay. Numerous canals drain the residential areas east of the water conservation areas and of ENP. The naturally occurring sloughs, Shark River Slough and Taylor Slough, flow from the north and east respectively in ENP and drain into Florida Bay. These human-made and natural elements are all integral to water management, and therefore sparrow management in the region. Exhibit 2-1 presents the features relevant to this analysis.

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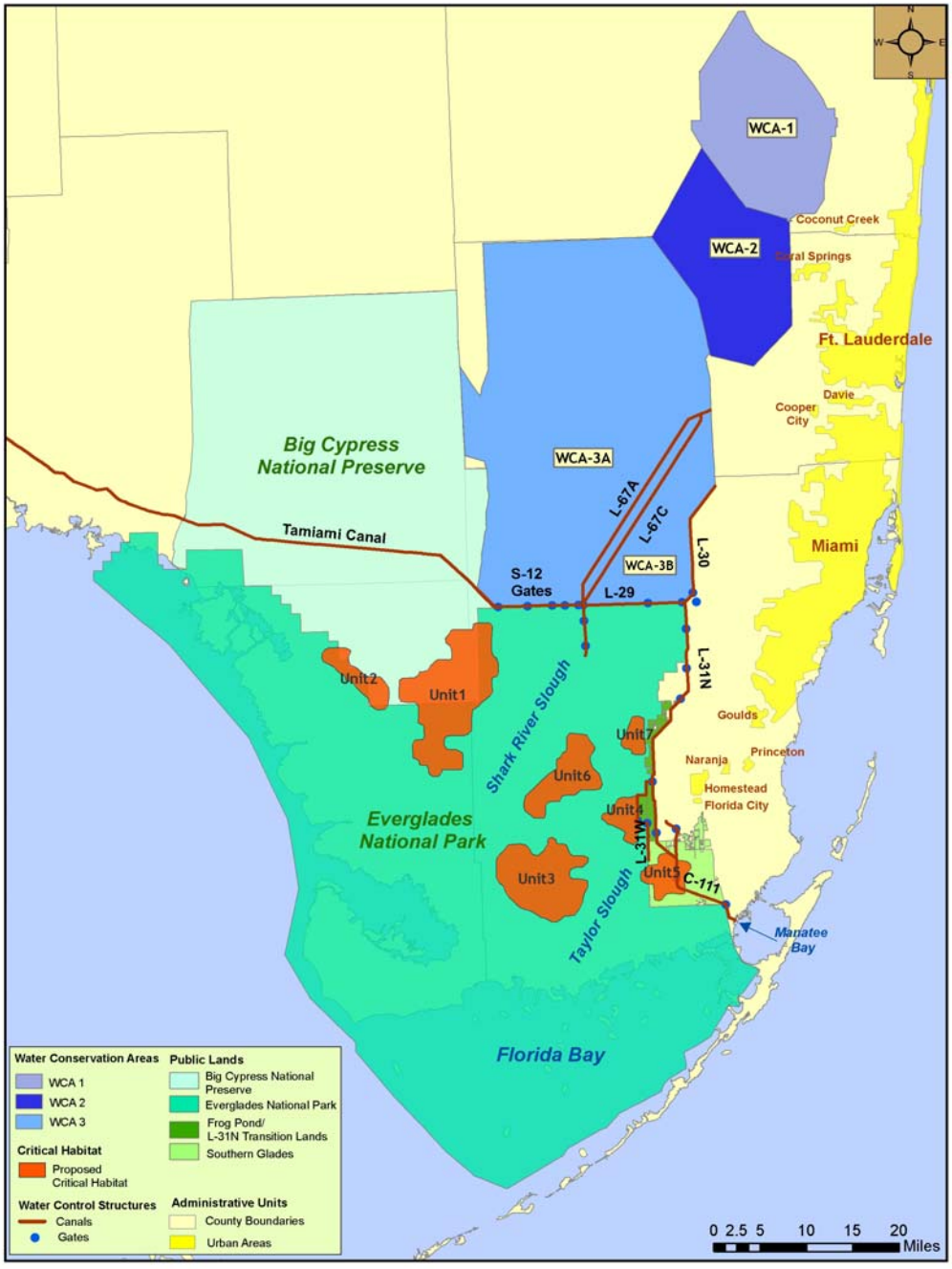
[23] See Sections 3 and 4 for more detail on the Miccosukee Tribe's use of the Everglades, and the interests of recreationists.

[24] U.S. Fish and Wildlife Service, Proposed Critical Habitat Designation for the Cape Sable Seaside Sparrow, 71 FR 63980, October 31, 2006.

## EXHIBIT 2-1 MAJOR WATER FEATURES RELATED TO SPARROW CONSERVATION



## 2.2 BASELINE EVALUATION

49. This section describes the historical, current, and expected future Everglades restoration activities that are related to and influenced by the sparrow. The USACE and SFWMD operate a complex system of water management structures throughout southern Florida that regulate the quantity, distribution and timing of water flows in the Everglades. A simplified schematic of these structures described above is presented in Exhibit 2-1. The USACE built numerous canals, levees, detention ponds, gravity-flow water control structures and pumps to control water in south Florida in response to damaging hurricanes in the 1940s. Formalized in 1962 under the Central and South Florida project (C&SF) for flood control and water supply, the complex network of these structures and their operations control the quantity, timing, and distribution of water flow in the Everglades, and in the adjacent residential and agricultural areas.[25] The C&SF structures and operations have been modified as project purposes have changed, as more is understood about the Everglades ecosystem, and as restoration efforts are undertaken. The general evolution of these plans and the associated environmental changes and effects on water flow provide necessary context for the currently identified threats facing the sparrow, and the protection measures being undertaken for its benefit. The structures and operations most directly connected to sparrow conservation efforts are the S-12 spillway structures along the Tamiami Trail, and the series of canals, and detention ponds around the northeast and east sides of ENP.

50. Recent water management plans developed by the USACE attempt to satisfy water needs while navigating associated constraints. The current plan, the Interim Operational Plan (IOP), updates former plans to specifically address the needs of the sparrow. The IOP nonetheless is an interim, temporary plan, and has its own set of constraints. The Everglades National Park IOP Assessment Report describes the current challenge as involving efforts "… to avoid jeopardizing the existence of a species endemic to a portion of the ecosystem in the short term before restoration of the greater ecosystem can be effected in the longer term."[26] The plans have changed throughout the history of management in the Everglades, and will continue to be modified to meet future restoration goals.

51. Given the unique nature of the events described above, this analysis defines three distinct time periods to highlight the changes undertaken in water management to conserve the sparrow. The time periods are characterized as follows:

- **Time Period I: 1967 - 1994:** From listing of the sparrow as endangered, through the initial testing by USACE of experimental water deliveries to ENP for Everglades restoration.

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[25] U.S. Fish and Wildlife Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal - 111 Project.

[26] National Park Service. 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park. Page 1.

- **Time Period II: 1995 - 2011:** From the Service's first jeopardy finding for Test 7 of the USACE experimental water deliveries through implementation of the IOP for Protection of the Sparrow.
- **Time Period III: 2011 and onward:** Implementation of the Combined Structural and Operational Plan (CSOP) for the Everglades, and the Comprehensive Everglades Restoration Plan (CERP).

52. Different water operations and management, efforts for conservation of the sparrow, and associated economic impacts occur in each time period. Minimal species management efforts occurred in Time Period I as no explicit concerns for sparrows related to water management were identified in that time. Efforts for protection of the sparrow are concentrated in Time Period II, as water management was modified in preliminary Everglades restoration efforts, and caused changes in water flows and levels that were identified as threats to the sparrow. The nature of sparrow conservation efforts in Time Period III are uncertain, but some continued conservation effort is likely. The following sections present the structural, operational, and management changes of sparrow conservation efforts in each time period, while the economic impacts associated with the changes are presented in Sections 3 and 4.

## 2.3 STRUCTURES, OPERATIONS, AND MANAGEMENT BY TIME PERIOD

### 2.3.1 TIME PERIOD I: 1967-1994

53. No major conservation efforts for the sparrow occurred during this period apart from general species management efforts (Exhibit 2-2). However, late in this period, as water management by the USACE began to focus on Everglades restoration, concerns about negative impacts to the sparrow began to surface. In this time period, the sparrow was listed as endangered and critical habitat was designated for it. In 1983, a recovery plan was completed for the sparrow.

54. The following year, Congress authorized the USACE to begin a program of experimental water deliveries to the Everglades with the goal of restoring a more natural flow of water through the region.[27] The Experimental Program consisted primarily of changes in the operation of current water management facilities, referred to as test iterations.[28] The Service determined that test iterations one through five would have no effect on the sparrow. The Service also determined that test iteration six, begun in July 1993, was not likely to jeopardize continued existence of the sparrow, but included a recommendation in its consultation on the test to lower the flows released into Taylor Slough during

[27] The Experimental Program replaced a schedule of minimum flows adopted in 1970. In response to observed negative environmental impacts in Everglades National Park, it allowed USACE to test alternative water delivery options, to better manage water flows for Everglades restoration. Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal -111 Project, Section on Consultation History.

[28] U.S. Fish and Wildlife Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal -111 Project. Executive Summary.

sparrow nesting season.[29] No other major events occurred that altered water management in the Everglades due to conservation of the sparrow during the first time period of this analysis, though concern for the sparrow population's health increased.

55. In 1993, a survey revealed a decline in Subpopulation A (Units 1 and 2).[30] Until 1993, Subpopulation A was understood to be one of two core subpopulations of the species. This decline precipitated action by the Service to minimize the effects of water management activities under the USACE experimental water deliveries program Test 7, and marked the beginning of a series of management modifications for the protection of the sparrow. These changes are described in the next section.

**EXHIBIT 2-2 SUMMARY OF MAJOR EVENTS IN TIME PERIOD I**

| YEAR | MAJOR EVENT |
|---|---|
| 1967 | Sparrow determined to be threatened with extinction |
| 1977 | Critical habitat designated for the Sparrow |
| 1983 | Park requested restorative action; recovery plan for Sparrow completed |
| 1984 | Experimental Program of water deliveries to ENP authorized |
| 1989 | Congress authorizes USACE Modified Water Deliveries to Everglades National Park, as part of the Everglades National Park Protection and Expansion Act |
| 1993 | Survey of Subpopulation A indicates sharp decline in sparrow population (area in Unit 1) |
| 1994 | Non-jeopardy biological opinion issued for Test Iteration 6 of the Experimental Program to ENP. Biological opinion included recommendation to limit quantity of flow into Taylor Slough during sparrow nesting season. |

### 2.3.2 TIME PERIOD II: 1995-2006

56. Time period II marks a period of a heightened level of activity for sparrow conservation (Exhibit 2-3). While a variety of perspectives exist on how water management is linked to and affected by sparrow conservation, it is agreed that certain projects have been undertaken expressly for conservation of the sparrow. These projects currently fall under the umbrella of the USACE IOP for protection of the sparrow, the plan in place until a more comprehensive and permanent management plan is developed to replace it. A series of USACE water management plans and projects, and the Service's findings on their effects on the sparrow led to development of the IOP. These plans and projects include the Modified Water Deliveries, the Canal-111 (C-111) projects, and the Experimental Program. Overall the Modified Water Deliveries and C-111 projects comprise the structural components of efforts to improve water management in the Everglades. They were developed as additions and modifications to the C&SF Project.

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[29] U.S. Fish and Wildlife Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal - 111 Project. Page 7.

[30] The survey found a drop from over 2,500 birds in 1992, to less than 500 birds in 1993.

The Experimental Program tests a variety of operational scenarios, using structural elements of both Modified Water Deliveries and C-111. Thus, the three are closely related to IOP and CSOP.[31]

**EXHIBIT 2-3 SUMMARY OF MAJOR EVENTS IN TIME PERIOD II**

| YEAR | MAJOR EVENT |
|---|---|
| 1995 | Jeopardy decision on Test Iteration 7 for the sparrow |
| 1998 | Biological opinion issued on the Central and South Florida Project Comprehensive Review Study noting possibility for adverse effects, but overall benefits likely for the sparrow |
| 1999 | South Florida Multi-Species Recovery Plan issued. The document is a revised recovery plan for the sparrow. |
| 1999 | Jeopardy Biological Opinion decision for the Modified Water Deliveries to Everglades National Park, Experimental Water Deliveries Program, and the C-111 Project[32] |
| 2000 | Comprehensive Everglades Restoration Plan (CERP) authorized |
| 2000 | USACE issues Interim Structural and Operation Plan (ISOP) |
| 2001 | USACE issues revised ISOP, develops IOP Alternative 7, and drafts EIS |
| 2002 | USACE develops revised IOP Alternative 7R and signs IOP ROD; planning was initiated by USACE and partners for CSOP; Service amends 1999 Biological Opinion on IOP Alterative 7R and concurs with the USACE determination that the IOP would adversely affect the Everglades snail kite and its designated critical habitat in Water Conservation Area-3A and would not jeopardize the sparrow. |
| 2006 | USACE issues draft SEIS for protection of the sparrow; Service issues revised Biological Opinion on IOP Alterative 7R. |

#### 2.3.2.1 Modified Water Deliveries, and C-111 Projects

57. The 1989 Modified Water Deliveries program was designed to improve water delivery to ENP, through structural modifications and additions to the existing C&SF Project. The primary goal of the continuing modified deliveries is to restore the hydrology north of ENP that would allow water flow from Water Conservation Area 3A (WCA-3A), through WCA-3B, and into Shark River Slough in ENP. See Exhibits 2-4, 2-5, and 2-7 for a graphical depiction of the evolution of water management over time. Some project elements have been completed, while others remain incomplete, due to a variety of reasons. The C-111 project area separates the southeastern area of ENP from agricultural and residential lands east of ENP. Its most recently defined purpose (updated in 1994) includes flood control and water supply for areas east of ENP, and restoring Taylor Slough in ENP. Both projects were consulted on under section 7 of the Act. In 1994, Modified Water Deliveries was determined not to jeopardize the sparrow, but the C-111 project could not be fully evaluated at the time because only structural (not operational)

[31] U.S. Fish and Wildlife Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal -111 Project.

[32] U.S. Fish and Wildlife Service. 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal -111 Project.

information was available. As described below, these projects were consulted on again in concert with Test 7 of the Experimental Program.

#### 2.3.2.2 Experimental Program Test 7

58. Test iteration seven of the Experimental Program (Test 7) was designed to deliver water through the L-31W canal to the east side of ENP, and specifically to Taylor Slough. Deliveries would be made according to a program based on water levels in canals, and rainfall. Because the area from which water would be delivered is used for flood control to protect the residential and agricultural areas east of it, Test 7 would sometimes result in higher flows entering Taylor Slough than the Service recommended for Test 6. [33] Concern regarding the effects of these flows on sparrow habitat (areas in proposed Units 4 and 7) resulted in the Service's jeopardy determination for Test 7 in 1995. The Service issued a biological opinion that found that implementation of Test 7, phase one, was likely to jeopardize the sparrow, but not likely to adversely modify its designated critical habitat. In 1997, after new information became available on potential impacts of Modified Water Deliveries, operations under C-111, and the Experimental Program, the Service requested that USACE reinitiate consultation on all three projects.

#### 2.3.2.4 1999 Biological Opinion

59. The Service completed a biological opinion based on the consultation in 1999, and found that the Experimental Program's Test 7 would jeopardize continued existence of the sparrow, and adversely modify its critical habitat. In the biological opinion, the Service included newly published information indicating that flows through the S-12 structures (south of WCA-3A) had resulted in an insufficient number of dry days available for sparrow nesting in the area of Subpopulation A in nine out of 20 years reviewed.[34] A single reasonable and prudent alternative outlined a sequence of actions for USACE to implement to avoid continued jeopardy and adverse modification.

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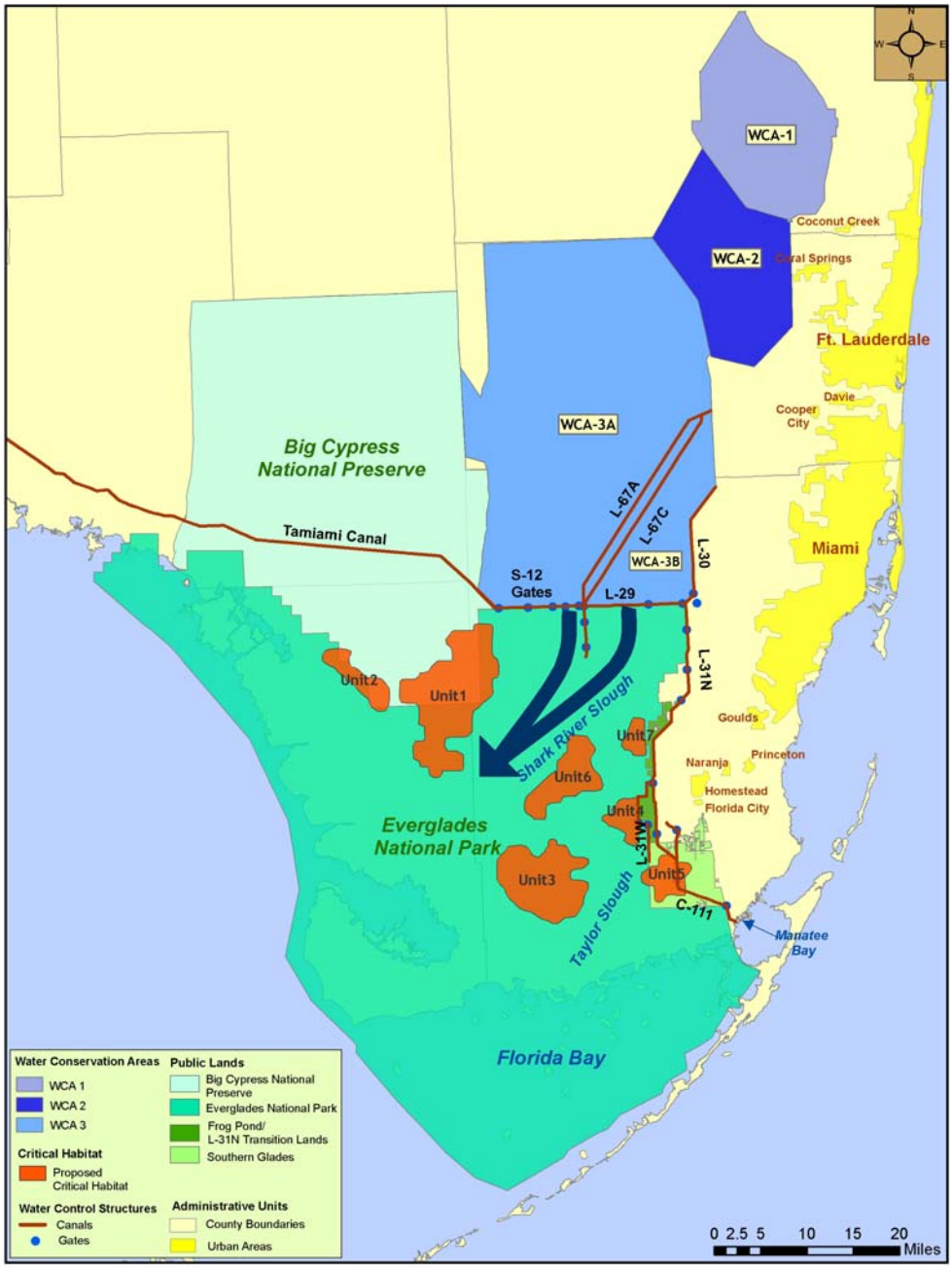
[33] U.S. Fish and Wildlife Service, 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal - 111 Project; pp. 8

[34] U.S. Fish and Wildlife Service, 1999. Biological Opinion on Modified Water Deliveries, Experimental Program, and Canal - 111 Project. Page 66. Service Opinion references Nott, et al. 1998. Water levels, rapid vegetational changes, and the endangered Cape Sable seaside sparrow. *Animal Conservation*1: 23-32.

## EXHIBIT 2-4 GENERALIZED WATER FLOWS BEFORE IMPLEMENTATION OF IOP




Note: Arrows do not represent actual or relative flow volumes.

#### 2.3.2.5 Interim Structural and Operational Plans (ISOP) 2000/2001

60. USACE developed the ISOP in 2000 to begin to implement a hydrologic equivalent to the reasonable and prudent alternative given in the Service's 1999 biological opinion for protection of the sparrow and its habitat. Officially known as the "ISOP Emergency Deviation from Test Iteration 7 of the Experimental Program to ENP for protection of the Cape Sable seaside sparrow," it required both structural changes, and operational changes in order to meet the conditions of avoiding high and low water levels to protect sparrow habitat. It further required development of a fire management strategy, and annual reports on implementation of the requirements.

61. The net effect of changes made in the ISOP was to have less water in western Shark River Slough, and more water entering ENP from the east through Taylor Slough and the Rocky Glades area. This would improve nesting for Subpopulation A near western Shark River Slough, and improve areas in eastern ENP that were too dry for sparrow habitat. This was achieved through a major change limiting the quantity of water discharged through the S-12 structures from WCA-3A into western Shark River Slough, and routing the water that previously flowed through them to the eastern edge of ENP, and south through the South Dade Conveyance System and C-111 project area.[35] Some of the structures necessary to move water in this way were previously planned in Modified Water Deliveries and C-111 projects. The ISOP therefore effectively expedited their implementation for conservation of the sparrow. Continuing concern for the sparrow related to ISOP led to mediation between the Federal agencies resulting in the first version of the current management plan (i.e., IOP), designed for protection of the sparrow.

#### 2.3.2.6 Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (IOP)

62. The IOP was finalized and ROD was signed in 2002 after several years of coordination with stakeholders. The IOP Alternative 7 resulted from interagency efforts, and facilitation provided by the U.S. Institute for Environmental Conflict Resolution in 2001 with support from State and Federal agencies. Later that year, SFWMD withdrew its support, citing flood control concerns for areas east of ENP. Alternative 7R was developed to address these concerns, and the current version of the IOP is referred to as IOP-Alt.7R. Construction of IOP features has continued through to the present. The IOP comprises features from the ISOP, as well as features from the Modified Water Deliveries, and the C-111 projects - primarily detention reservoirs, and pump stations. It is intended as a temporary plan, to be replaced as other features of Modified Water Deliveries and C-111 are completed, and a new plan synthesizing all the water management structures and operations is developed. The components of IOP-Alt. 7R are listed below.

[35] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park. 61 pages.

### Components of IOP - Alt. 7R

63. The IOP includes both structural and operational components. The structural components are primarily detention pond areas, and pumps, while the operational component is a marsh-driven plan for management of the structural components. The major difference between the ISOP and IOP was the construction of seepage reservoirs between the L-31N canal and ENP. These seepage reservoirs were expected to act as hydraulic barriers, decreasing seepage losses from ENP. The following are the structural changes made as part of the IOP: [36]

#### Structural

- Degradation of the lower four miles of the L-67 extension canal and levee.
- Raising of the western levee of the S-332B detention area to reduce the frequency of surface water flows from the detention cell into ENP. This feature is predicated on the completion of an additional detention area (S-332B north) adjacent to the original ISOP-implemented S-332B west detention area.
- Construction of the temporary S-332C 500 cubic feet per second (cfs) pump station associated with the C-111 project.
- Construction of four new reservoirs within the C-111 project area:
    - S-332B north detention area to augment storage capability of the existing ISOP 2000 S-332B west detention area.
    - S-332C detention area.
    - Connector detention area between the S-332B and S-332C detention areas.
    - S-332D detention area including a high head cell located immediately west of the S-332D pump station to distribute the water discharged from the pump along the full width of the northern portion of this detention area (this detention area is also known as the Frog Pond).
- Construction of a temporary S-356 pump station to discharge from the L-31N canal into the L-29 canal.

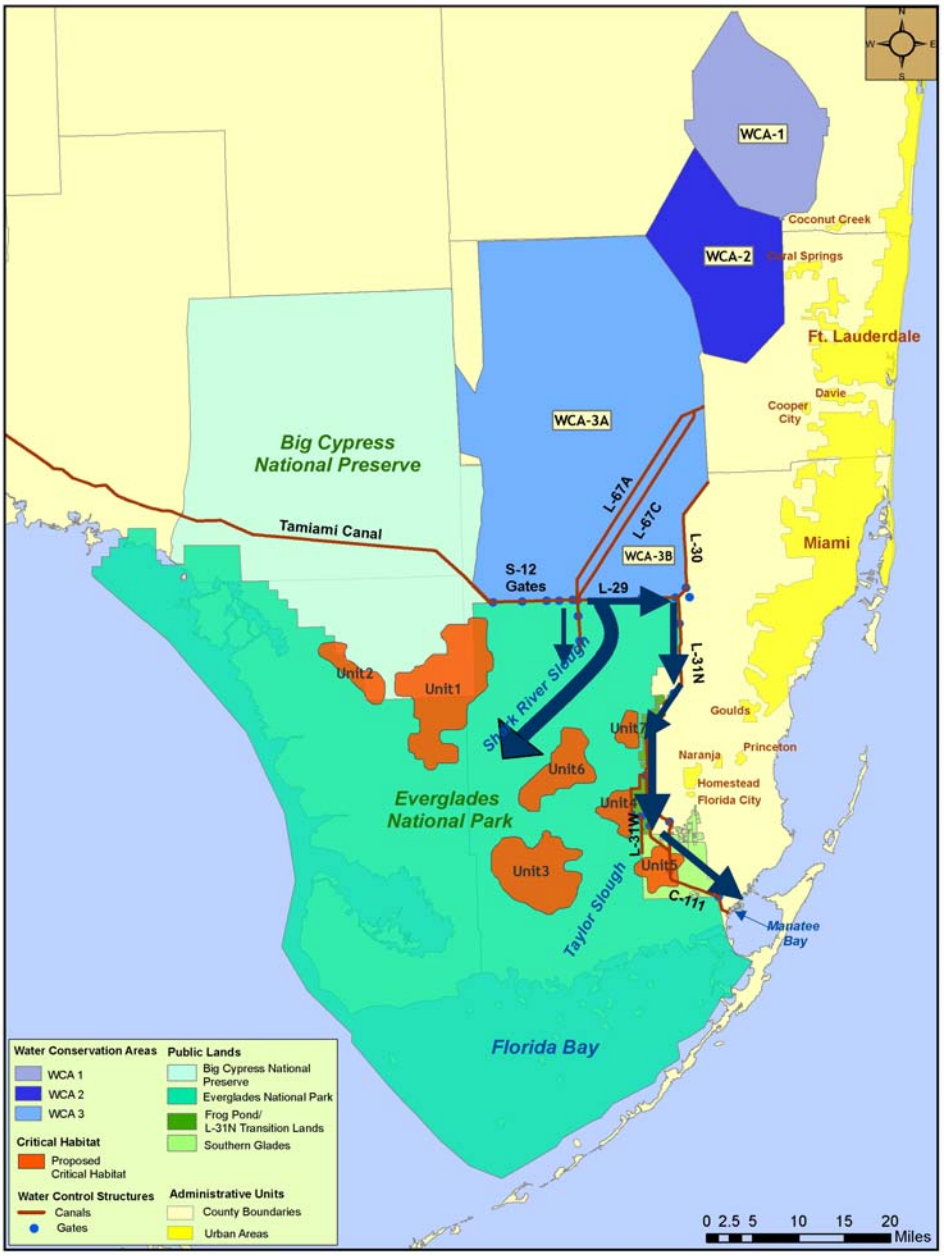
#### Operational

- A marsh-driven operational plan, to be implemented through a collaborative interagency process, to address concerns expressed by ENP regarding potential impacts of direct surface water discharges as well as high water levels in the detention areas.

36 National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp.11.

64. Like the ISOP, the net effect of the IOP operations is to lessen the quantity of water near Subpopulation A during the sparrow nesting season, and provide more water to the sparrow populations on the east side of ENP by routing water around ENP with usage of new temporary pumps to both maintain flood control levels in the canals, and allow seepage into Taylor Slough through the new detention ponds. In addition, it contains rules to maintain flood protection for areas east of ENP.

**EXHIBIT 2-5 GENERALIZED WATER FLOWS UNDER THE IOP**




Note: Arrows do not represent actual or relative flow volumes.

65. In 2006 the USACE re-initiated consultation with the Service for continuation of the IOP. The Service issued a biological opinion indicating the IOP will not adversely affect sparrow habitat nor jeopardize the snail kite or adversely modify its critical habitat; this

biological opinion supersedes the first biological opinion on the sparrow issued in 1999, and amended in 2002. While determined to not adversely affect sparrow habitat, the IOP carries other water management and ecological tradeoffs resulting in concern, and direct costs to stakeholders. See Section 3 for more detail on these tradeoffs.

### 2.3.3 TIME PERIOD III: 2011 - ONWARD

66. Time period three is loosely defined as the period after conclusion of the IOP. The impact of sparrow conservation efforts on restoration activities during this period are highly uncertain given the nature of the timing of future activities.

#### 2.3.3.1 Combined Structural and Operational Plan

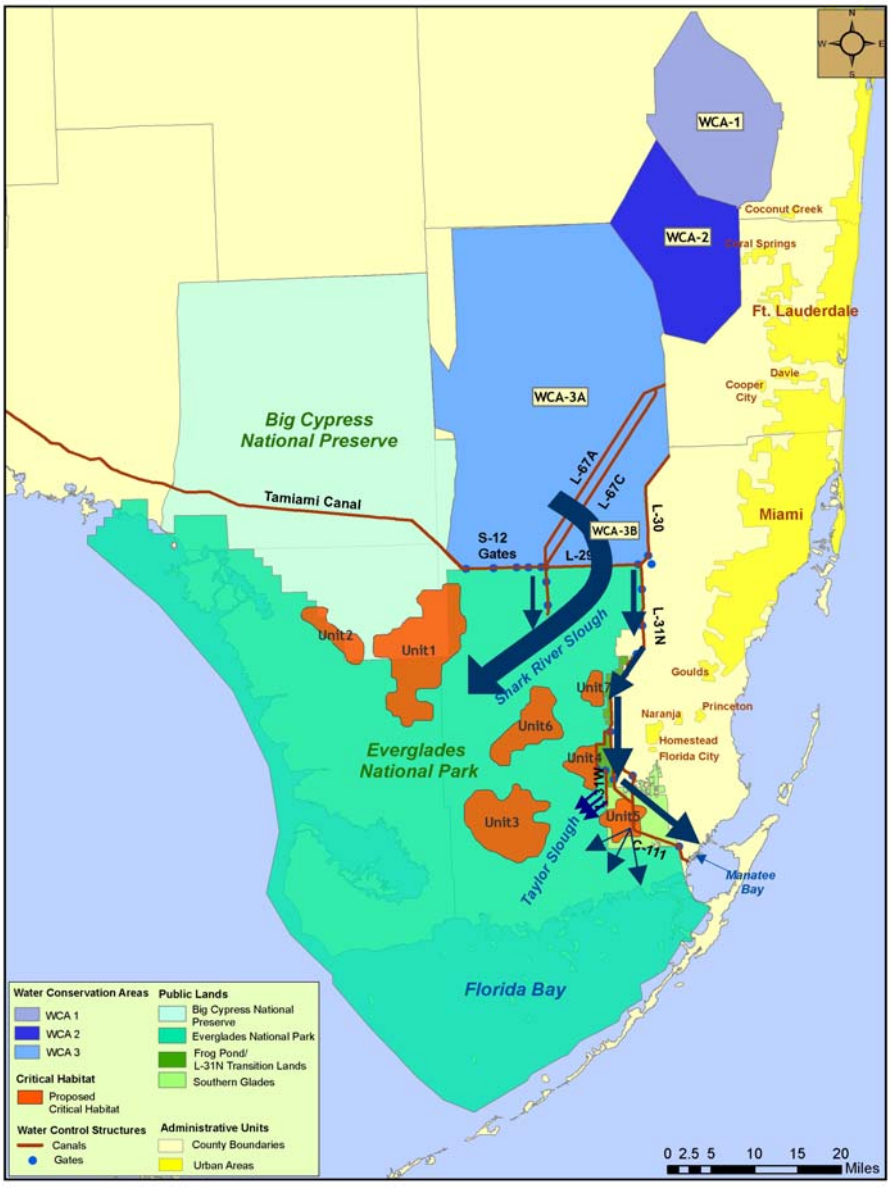
67. The IOP will be in place until full implementation of CSOP. CSOP is currently in development by USACE and its partners and stakeholders, and is intended to define the operations for the Modified Water Deliveries and C-111 projects combining their original purposes and the various management changes adopted since their origination. While the currently expected ROD date for CSOP is 2008, it will not be fully implemented until the Tamiami Trail portions of the Modified Water Deliveries project are completed, expected in 2010 or 2011. Given the complexity of the management options and constraints in the Everglades, and the public nature of the process, the timing of CSOP design and implementation remains uncertain.

68. CSOP plan components include conveyance between WCA-3A and 3B, seepage control on the east side of ENP, and elevating portions of the Tamiami Trail between WCA-3B and ENP to restore more natural water flows into ENP.

**EXHIBIT 2-6 SUMMARY OF MAJOR EVENTS IN TIME PERIOD III**

| YEAR | MAJOR EVENT |
|---|---|
| 2011 | Combined Structural and Operational Plan (CSOP) |
| Ongoing | Planning and implementation of Comprehensive Everglades Restoration Plan (CERP) features and project components |

## EXHIBIT 2-7 GENERALIZED FUTURE WATER FLOWS




Note: Arrows do not represent actual or relative flow volumes.

#### 2.3.3.2 Comprehensive Everglades Restoration Plan (CERP)

69. Authorized in 2000, the CERP is currently being implemented with restoration expected to be complete by 2050.[37] Over 60 projects make up CERP, and several of them will directly relate to, or overlap with, other water management efforts that impact the sparrow. The larger projects, currently in planning, that may impact the sparrow include the following:

- **WCA-3 Decompartmentalization and Sheetflow Enhancement** including construction of new water control structures and removal of levees.
- **Levee-31N (L-31N) Seepage Management Pilot** including studies of technology and management options for seepage coming from the east side of ENP.
- **Everglades National Park Seepage Management** including evaluation of L-31N improvements, pump S-356 structure relocation to potentially reduce seepage losses.
- **C-111 Spreader Canal** to enhance freshwater wetlands in the Southern Glades and Model Lands.

The intended net effect of projects implemented under CERP is to improve and restore the quantity, quality, timing and distribution of water flow in south Florida.[38]

#### 2.3.3.3 Uncertainties associated with impacts of sparrow conservation measures in the future

70. The implementation of CERP and CSOP are expected to begin to harmonize the various management options and constraints for the overall goal of restoring the Everglades. However, there are numerous tradeoffs currently, and in the future potentially related to sparrow management. The CSOP components presented above are intended to provide better seepage control on the east side of ENP, and to restore more natural water flows into ENP. This is expected to improve flow in northeast Shark River Slough, remove the need to control S-12 gates as rigorously as under the IOP, and reduce the likelihood of higher water levels in WCA-3A. CERP also includes several water management projects, which may affect the sparrow. However, the nature of the impacts is still unclear because the plans are not finalized.

71. Meeting future water supply needs in southeast Florida is also an area of uncertainty in the region with unknown implications for the sparrow. Meteorological events may highlight additional water infrastructure needs such as flood control measures to respond to population growth, or increased demand for agricultural water. Currently, drought conditions and resultant water use restrictions in place have caused concern about

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[37] Comprehensive Everglades Restoration Plan: An Annual Update. 2006. A partnership of the U.S. Army Corps of Engineers, the South Florida Water Management District and others.

[38] Comprehensive Everglades Restoration Plan: An Annual Update. 2006. A partnership of the U.S. Army Corps of Engineers, the South Florida Water Management District and others.

municipal water supply for the growing southeast Florida region.[39] For example, in Lake Okechobee, the normal backup water supply for the region, water levels are low. There is concern that without additional supply to the lower east coast the normal supply will be damaged by saltwater intrusion. In April 2007, SFWMD requested that USACE temporarily deviate from current management and lower the water levels in the WCAs to provide additional water for supply purposes, and to avoid potential saltwater contamination of the existing water supply. This request is currently being considered by USACE, and requires an expedited environmental assessment review, and National Environmental Policy Act (NEPA) documentation.[40]

72. Despite these concerns and activities related to municipal water supply in the region, a recent SFWMD rule prevents further use of the WCAs and the Everglades to meet increased municipal demand. Future water supply will come from alternative sources and not from the C&SF project areas, or from the Everglades. Formalized as the Regional Water Availability Rule, the policy prevents water users from tapping the Everglades for any new or additional water supply. This includes the WCAs and ENP, and is cited as a method for SFWMD to meet their objective of ensuring that "water necessary for Everglades restoration is not allocated for consumptive use upon permit renewal or modification."[41]

73. Despite implications for temporary drought water management changes in the region, and potential impacts to wildlife in the WCAs, the above activities are not expected to directly intersect with sparrow conservation concerns. To date, sparrow conservation efforts have resulted in preventing flow from WCA 3 to ENP through the S-12 structures, not requiring greater flows from them. In addition, the Regional Water Availability Rule establishes that no new permitted water withdrawals will be made that affect Everglades restoration. To the extent that sparrow conservation is integrated with overall Everglades restoration in the future, the recent rule suggests that water supply management is consistent with sparrow conservation.

74. The impact of sparrow conservation measures on agencies and stakeholders in the future is therefore linked to future water management policies and projects for restoring the ecosystem of the Everglades. The uncertainty associated with these impacts is currently the major source of concern, and with time, may give way to specific concerns as CSOP and CERP plans are finalized.

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[39] Various news articles. For example: (1) Hollis, M. "Everglades still may be tapped for drinking water during drought, Crist told" Sun-Sentinel.com, Talahassee Bureau. April 17, 2007. Accessed at: http://www.sun-sentinel.com/news/local/florida/sfl-fdrought17apr17,0,4176271.story. (2) Reid, A. "As drought pain deepens, water managers want permission to tap Everglades". South Florida Sun-Sentinel. April 14, 2007. Accessed at: http://www.sun-sentinel.com/news/local/southflorida/sfl-pwater14apr14,0,848878.story?coll=sfla-home-headlines.

[40] USACE, 2007. Letter seeking comment on South Florida Water Management District requested temporary deviation to the Approved Water Control Plan for Water Conservation Areas 1, 2A, and 3A. Accessed at: http://www.saj.usace.army.mil/ on April 24, 2007.

[41] SFWMD, 2007. Publication Rule Draft (including administrative changes needed to incorporate cross references to Chapter 40E-2, 40E-8, and 40E-20 and to update citations to the Water Use Basis of Review). Accessed at: https://my.sfwmd.gov/portal/page?_pageid=1874,9680108&_dad=portal&_schema=PORTAL on April 24,2007.

# SECTION 3 | POTENTIAL ECONOMIC IMPACTS OF CHANGES IN WATER MANAGEMENT FOR THE SPARROW IN THE EVERGLADES

75. This section presents the impacts of water management actions undertaken for the sparrow. Although the overall restoration of the Everglades ecosystem may be beneficial to the sparrow and its habitat, conservation efforts for the sparrow have led to changes in the original plans of three water delivery projects being jointly managed by the USACE and SFWMD. These projects include Modified Water Deliveries, Canal 111, and Experimental Water Deliveries Program. The USACE has incurred and may continue to incur costs associated with these water management changes. The structural and operational changes have also affected the nature and schedule of the original plans for the restoration of the Everglades. While these structural and operational water management actions are expected to benefit the sparrow, they have also been the source of concern regarding the overall ecological impacts of these changes, and the potential economic impacts of these ecological changes. Moreover, the Miccosukee Tribe of Indians, whose historical lands within the Everglades are affected by the water management actions, has opposed several of the changes made for sparrow conservation.

76. This section first quantifies the direct costs incurred by USACE and SFWMD to implement structural and operational changes for the sparrow, during pre-designation and post-designation (2007 – 2026) time periods. Next, this section qualitatively presents the potential economic impacts associated with water management for the sparrow.

## 3.1 SUMMARY

### 3.1.1 PRE-DESIGNATION COSTS

77. This analysis considers pre-designation impacts from 1995 until 2007, when the final rule is expected to be published. Thus the pre-designation period for this section contains a portion of Time Period II.

78. The total present value of pre-designation impacts related to changes in water management for the sparrow in the Everglades is estimated to be $28.1 million (using a discount rate of three percent). Most of the costs associated with sparrow conservation efforts were undertaken by USACE during the period of 1995 to 2006. Prior to 1995, no changes in water management were undertaken for conservation of the sparrow. Exhibit 3-1 presents the total pre-designation impacts of changes in water management by critical habitat unit. As the exhibit shows, Unit 1 is the primary driver of these costs. As discussed in Section 2, concerns of over-hydration in Unit 1 resulted in implementation of IOP Alt. 7R, and the adjustment in more water flows around to the east.

**EXHIBIT 3-1 TOTAL PRE-DESIGNATION IMPACTS OF CHANGES IN WATER MANAGEMENT FOR THE CONSERVATION OF THE SPARROW**

| UNIT | UNDISCOUNTED | PRESENT VALUE (3 PERCENT) | PRESENT VALUE (7 PERCENT) |
|---|---|---|---|
| 1: Subpopulation A Marl Prairies | $24,300,000 | $28,100,000 | $34,200,000 |
| 2: Subpopulation A Cordgrass Marshes | $0 | $0 | $0 |
| 3: Subpopulation B | $0 | $0 | $0 |
| 4: Subpopulation C | $0 | $0 | $0 |
| 5: Subpopulation D | $0 | $0 | $0 |
| 6: Subpopulation E | $0 | $0 | $0 |
| 7: Subpopulation F | $0 | $0 | $0 |
| **Total** | **$24,300,000** | **$28,100,000** | **$34,200,000** |

### 3.1.2 POST-DESIGNATION COSTS

79. This analysis estimates post-designation impacts for the time period 2007 through 2026. Thus post-designation costs are estimated for the latter half of Time Period II (i.e., 2007 through 2011) and Time Period III.[42]

80. The total present value of post-designation impacts of changes in water management for the sparrow in the Everglades is estimated to be $8.8 million (using a discount rate of three percent). Most of the costs associated with sparrow conservation efforts are anticipated to be undertaken by USACE associated with management plans developed prior to the revision of critical habitat. Beginning with the full implementation of CSOP and CERP (assumed for purposes of this analysis to begin around 2011), it is uncertain whether incremental conservation measures implemented for sparrow conservation will represent a significant constraint on overall water management activities. For example, under certain circumstances, overall Everglades restoration and sparrow conservation efforts may become more harmonized, thus diminishing related economic impacts. Given the current uncertainty concerning overall CERP implementation, however, no long-term impacts from sparrow conservation are quantified. Note that general species management activities, including surveying and fire management, will continue. These costs are outlined in Section 4. Exhibit 3-2 presents the total post-designation impacts of changes in water management by critical habitat unit. Again, this analysis burdens Unit 1 with these costs because water management actions were primarily implemented to improve conditions for Subpopulation A.

[42] Note that species management costs related to sparrow conservation are estimated for Time Period III in section 4.

**EXHIBIT 3-2 TOTAL POST-DESIGNATION IMPACTS OF CHANGES IN WATER MANAGEMENT FOR THE CONSERVATION OF THE SPARROW**

| UNIT | UNDISCOUNTED | PRESENT VALUE (3 PERCENT) | PRESENT VALUE (7 PERCENT) |
|---|---|---|---|
| 1: Subpopulation A Marl Prairies | $9,210,000 | $8,810,000 | $8,340,000 |
| 2: Subpopulation A Cordgrass Marshes | $0 | $0 | $0 |
| 3: Subpopulation B | $0 | $0 | $0 |
| 4: Subpopulation C | $0 | $0 | $0 |
| 5: Subpopulation D | $0 | $0 | $0 |
| 6: Subpopulation E | $0 | $0 | $0 |
| 7: Subpopulation F | $0 | $0 | $0 |
| **Total** | **$9,210,000** | **$8,810,000** | **$8,340,000** |

Note: As described in the preceding paragraph, water management impacts due to sparrow conservation are not quantified beyond 2011.

## 3.2 TIME PERIOD II: 1995 – 2011

81. As mentioned earlier, no costs related to water management for sparrow conservation are known to have been incurred in Time Period I. In Time Period II, following the 1999 biological opinion the USACE incurred costs due to the structural and operational changes implemented for sparrow conservation. This section presents the actions undertaken for sparrow conservation and the costs associated with those actions, as provided by the USACE.[43] Impacts discussed in this section include pre-designation costs incurred between 1999 and 2007, and post-designation costs between 2007 and 2011.

### 3.2.1 INTERIM STRUCTURAL AND OPERATIONAL PLANS 2000 -2001

82. The USACE implemented the ISOP in 2000 during the sparrow nesting season to ensure that its water management operations were consistent with sparrow conservation. As discussed in Section 2, the most significant features of ISOP 2000 were S-12 closures and the construction of the S-332B pump and the S-332B west detention area (seepage reservoir) adjacent to the pump, on the eastern edge of the Everglade. These structural features were introduced to provide sufficient water to the eastern Subpopulations C, E, and F (Units 4, 5, and 7). These structures were not part of the original C-111 project, and were built specifically for sparrow conservation. The USACE spent an estimated $11.9 million (discounted at three percent) on the construction of the S-332 B pump station and detention area, and planning and engineering efforts to develop operational deviations.[44]

[43] Written communication from Kimberly Taplin, Jacksonville District, US Army Corps of Engineers, March 6, 2007.

[44] Note that this analysis still attributes these costs to Unit 1, as conservation concerns there engendered increased water flow around to eastern ENP, which precipitated additional management concerns. It may be appropriate, however, to allocate an uncertain portion of these costs to other units.

83. Implementation of the ISOP also necessitated expedited construction of some other features (e.g., construction of S-356 pump and degradation of L-67 extension) originally planned as part of the Modified Water Deliveries and C-111 projects, but not scheduled to be implemented until later. The USACE does not have an estimate of the costs to accelerate the construction of these structures.

### 3.2.2 INTERIM OPERATIONAL PLAN (IOP) 2002-2011

84. The Record of Decision for the IOP was signed in 2002 after a series of interagency meetings, and planning and engineering efforts on the part of the USACE. The IOP has been the water management plan in place since 2002 and is expected to be in effect until implementation of CSOP around 2011.

85. The USACE has incurred costs due to the planning, engineering and operation of structures to specifically accommodate the needs of the sparrow. Exhibit 3-3 presents the pre-designation costs associated with the IOP between 2001 and 2006, during which time the USACE spent an estimated $16.1 million (discounted at three percent) on planning and engineering efforts for development of the IOP, operating pumps, and monitoring hydrological conditions within sparrow habitat. In the early years of the post-designation period, between 2007 and 2011, the USACE estimates spending an additional $8.8 million for operating pumps, and monitoring hydrological conditions.[45]

**EXHIBIT 3-3 SUMMARY OF DIRECT COSTS INCURRED BY USACE FOR WATER MANAGEMENT FOR SPARROW CONSERVATION (2000 – 2011) IN TIME PERIOD II (DISCOUNTED AT THREE PERCENT)**

| FISCAL YEAR | ACTIONS | EXPENDITURE |
|---|---|---|
| 2000 (pre-designation) | Construction of S-332B pump station and detention area; planning and engineering efforts to develop operational deviations. | $11,900,000 |
| 2001 – 2006 (pre-designation) | Planning and engineering to develop IOP; monitoring hydrological conditions in habitat areas; operation of pumps. | $16,100,000 |
| 2007 – 2011 (post-designation) | Monitoring hydrological conditions in habitat areas; operation of pumps. | $8,810,000 |

### 3.2.3 POTENTIAL BENEFITS AND TRADE-OFFS ASSOCIATED WITH IOP

86. Due to the complex system of water management and several competing objectives of Everglades ecosystem restoration, sparrow conservation efforts under ISOP and IOP, flood control, water supply and management considerations for neighboring residential and agricultural areas, and preservation of cultural resources within the ENP and BCNP have become sources of concern for several agencies and interest groups in South Florida. Exhibit 3-4 presents a summary of the potential ecological and economic impacts

[45] CSOP is expected to replace IOP by year 2011.

associated with these water management plans. The following sections discuss these potential ecological and economic impacts in more detail.

**EXHIBIT 3-4 POTENTIAL ECOLOGICAL AND ECONOMIC IMPACTS RELATED TO THE ISOP 2000/2001 AND IOP 2002 – 2011**

| WATER MANAGEMENT ACTION | POTENTIAL ECOLOGICAL IMPACTS | POTENTIAL ECONOMIC IMPACTS |
|---|---|---|
| Closure of S-12 structures | • Subpopulation A (Units 1 and 2) may experience drier (i.e., better) hydrological conditions for sparrow nesting and habitat maintenance.<br>• Degradation and loss of tree-islands due to higher water levels in WCA-3A.<br>• Injury and jeopardy to endangered and threatened species in WCA-3A.<br>• Minor to moderate changes in salinity levels in St. Lucie and Caloosahatchee estuaries and some estuaries in Florida Bay.<br>• Delay in implementation of MWD and therefore delay and possible permanent change in original objectives of the Everglades ecosystem restoration plans. | • USACE incurs costs due to additional planning efforts, and day-to-day operational changes.<br>• Reduction in recreational opportunities in WCA-3A due to access restrictions during high water levels in WCA-3A.<br>• Loss and degradation of the Miccosukee Tribe's cultural heritage (i.e., tree islands).<br>• Reduced access to areas considered as cultural heritage by the Miccosukee Tribe due to lower water levels in ENP.<br>• Negative impact on recreational and commercial fishing opportunities in St. Lucie and Caloosahatchee estuaries and some estuaries in Florida Bay. |
| Re-routing of water along the eastern edge of ENP through the SDCS | • Subpopulations C and F (Units 4 and 7) may experience more natural (i.e., wetter) hydrological conditions.<br>• Flow in Upper Taylor Slough approaches more natural levels.<br>• Increased hydroperiods in northeastern Shark River Slough may improve vegetation in some wetland areas and nesting and foraging habitat for some wildlife species.[46] | • USACE incurs costs due to additional planning efforts, new or expedited construction features, and day-to-day operational changes.<br>• Increased risk of flooding in agricultural areas in southern Miami-Dade county due to higher water levels in L-31N canal. |

[46] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp.; pp. 64, 67.

#### 3.2.3.1 ISOP 2000/2001 and the IOP related concerns about hydrological conditions in the Everglades

87. The most controversial issue surrounding sparrow conservation is water management prescribed by the ISOP 2000/2001 and the IOP (2002 – 2011), and its impact on the ecosystem of the Everglades. Several agencies, including the USACE, SFWMD, FWC and other stakeholders (e.g., the Miccosukee tribe) contend water management for the sparrow negatively affects other ecological resources. For example, water levels have been higher in WCA-3A in recent years. Higher water levels in WCA-3A are a source of concern for the following reasons:

- Higher water levels have resulted in degradation and loss of tree-islands, which support the habitat for several wildlife and plant species in the area, and are regarded by the Miccosukee Tribe as important cultural resources connecting them to their heritage and tradition.[47, 48, 49, 50] Note that the loss of tree-islands due to water-management actions has been occurring since at least 1945, according to the USACE. The Tribe claims that the IOP exacerbates this loss. The USACE has estimated that the cost of full restoration of tree-islands may range between $50,000 to $500,000 per acre.[51] However, due to the unknown and complex relationship between the IOP water management actions and the change in the rate of tree-islands loss, this analysis does not estimate the acres of tree island loss potentially attributable to the IOP nor the potential range in costs to restore tree island losses.
- The Service has concluded that 88,300 acres of Everglades Snail Kite critical habitat will be negatively impacted due to increased flooding in WCA-2A and higher stages in WCA-3A.[52, 53, 54] The habitat degradation is a result of a reduction in foraging habitat and the woody vegetation, which the Everglades snail kite uses for nesting and perch-hunting. In addition there has been a decline of 50 percent in the Everglades snail kite population since 1999, during the ISOP 2000/2001 and

[47] Comments by the Miccosukee Tribe of Indians of Florida on the Proposed Rule for Critical Habitat Designation for the Cape Sable Seaside Sparrow (CSSS); Fed. Reg. Vol. 71, No. 210; pp. 3.

[48] Personal communication Stakeholder meeting with South Florida Water Management District, January 24, 2007.

[49] Terry Rice, Colonel (U.S. Army Ret'd). P.E.. December 21, 2006. Peer Review of the U.S. Fish and Wildlife Service Proposed Rule to Revise Critical Habitat, 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Critical Habitat Designation for the Cape Sable Seaside Sparrow.

[50] Personal Communication with Michael Anderson, Florida Fish and Wildlife Commission, March 7, 2007.

[51] US Army Corps of Engineers, 2000. General Evaluation Report: 8.5 Square Mile Area, Final Environmental Impact Statement.

[52] US Fish and Wildlife Service, 2002. Final Amended Biological Opinion for The U.S. Army Corps of Engineers; Interim Operational Plan (IOP) for Protection of the Cape Sable Seaside Sparrow; pp. 48-49

[53] US Fish and Wildlife Service, 2006. Biological Opinion on Proposed Continuation of Interim Operational Plan (IOP) for the Protection of the Cape Sable Seaside Sparrow; pp. 68-72.

[54] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp. 76-85.

the IOP, and no snail kites fledged out of WCA-3A in 2005.[55] However, it should be noted because the snail kite is more mobile than the sparrow and has much larger habitat area, the Service and the USACE concluded that the IOP is not likely to have significant long-term impacts on the Everglades snail kite's abundance.

- Recent research also suggests that higher water levels in WCA-3A may also be causing a shift in the change in vegetation within WCA-3A.[56] This becomes a concern if the shift is in a direction not desired under the CERP.

The magnitude of incremental increases in water levels attributable to sparrow conservation efforts is, however, uncertain.[57, 58]

#### 3.2.3.2 Water management for the sparrow and its effects on overall ecosystem restoration in the Everglades

88. Several stakeholders are concerned that the current water management system, (represented by the IOP) constrains the long term restoration of the Everglades envisioned by CERP.

- SFWMD is concerned about the limitations that the IOP has imposed on the agency's ability to proceed with CERP. According to SFWMD, due to sparrow conservation efforts, and the consequent implementation of the IOP, opportunities for field experimentation, which is important for evaluating plans, have been reduced. The SFWMD is also concerned that the Everglades are drier due to sparrow focused water management. Lastly, the construction of the C-111 spreader canal may be constrained because Unit 5 lies in the canal footprint area.[59, 60] The SFWMD does not have an estimate of the costs associated with the potential changes that may be needed to the C-111 spreader canal construction at this time.

- When hydrological conditions from the period 1999 to 2006 are compared to historical conditions using the Natural Systems Model (which is the current modeled representation of historical hydrological conditions in the sawgrass Everglades), it appears that the ISOP 2000/2001 and the IOP have created drier

[55] Snail Kite Demography, Annual Report 2003, pp. 10; Snail Kite Demography, Annual Report 2003, pp. 10 & 19. (Quoted in: Terry Rice, Colonel (U.S. Army Ret'd). P.E.. December 21, 2006. Peer Review of the U.S. Fish and Wildlife Service Proposed Rule to Revise Critical Habitat, 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Critical Habitat Designation for the Cape Sable Seaside Sparrow; pp. 11)

[56] Personal communication Timothy Towles, Florida Fish and Wildlife Conservation Commission, March 8, 2007.

[57] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp. 55-56.

[58] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp.59.

[59] Personal communication, South Florida Water Management District. Stakeholder meeting, January 24, 2007.

[60] Paul Linton, P.E. Chief Consulting Engineer, South Florida Water Management District. Email sent to US Fish and Wildlife Service Vero Beach, Florida Field Office on January 02, 2007.

conditions than would be expected in a restored Everglades.[61] Additionally, the IOP has not improved flows into central and southern Taylor Slough. This has caused a shift in vegetation type that is counter to the overall goals of Everglades' ecosystem restoration.[62]

- The NPS also concluded in its assessment that the IOP has caused a moderate deterioration in quality of water by allowing outflows with higher than acceptable amounts of phosphorous into the Everglades from WCA 3-A and C-111 detention areas.[63]

#### 3.2.3.3 The IOP and the likelihood of flooding in southern Miami-Dade County

89. Although additional flood storage has been provided in southern Miami-Dade County as part of the IOP, the Service has suggested that there is still concern from farmers and residents of the area that higher water levels in the L-31N canal increase the likelihood of floods in the area.[64] Such concerns may be reduced if the CSOP is successfully implemented in the future. Note that after SFWMD raised such concerns about Alternative 7, Alternative 7R (the IOP) was improved to lower the risk of flooding in the agricultural and residential lands located to the east of the ENP.[65]

#### 3.2.3.4 The IOP and salinity changes in bays and estuaries in South Florida

90. Changes in salinity in estuaries and bays in South Florida are other potential impacts of the IOP. According to the SFWMD, USACE, and the Miccosukee Tribe, the routing of water through the South Dade Conveyance System instead of through the Everglades has resulted in an incremental increase in freshwater supplies to several estuaries in Florida Bay and in the Gulf Coast. Although the contribution of sparrow conservation to incremental flow of freshwater is uncertain, this flow is damaging to grass beds, and fish and shrimp habitats in the estuaries.[66, 67,68]

91. According to the NPS: "Salinity at most monitoring sites in Florida Bay and Gulf Coast estuaries increased slightly during the ISOP/IOP period compared to the Test 7 Phase 1 period, which is not desirable for the health of the ecosystem in Florida Bay." However,

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[61] Terry Rice, Colonel (U.S. Army Ret'd). P.E.. December 21, 2006. Peer Review of the U.S. Fish and Wildlife Service Proposed Rule to Revise Critical Habitat, 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Critical Habitat Designation for the Cape Sable Seaside Sparrow; pp. 10.

[62] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp.43, 58.

[63] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp. 18-25; 56-57.

[64] Personal Communication, US Fish and Wildlife Service Vero Beach, Florida Field Office. Meeting on January 25, 2007.

[65] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp 5.

[66] Stakeholder Meeting with Miccosukee Tribe, West Palm Beach, January 23, 2007.

[67] Stakeholder meeting with US Army Corps of Engineers, Jacksonville District January 16, 2007.

[68] Stakeholder meeting with South Florida Water Management District, West Palm Beach, January 24, 2007.

except for the annual salinity at Canepatch on the Shark River and March salinity at Canepatch and Broad River, these differences were not statistically significant".[69] The NPS and SFWMD suggest that these moderate increases in the salinity of Florida Bay are attributable to the change in timings of water flow across the Tamiami Trail, and through L-31W and C-111 canals.[70, 71] Additionally, the USACE's model indicates that although the volume of freshwater supply to the Florida Bay may also change, it will not be substantial compared to modeled hydrological conditions for the pre-ISOP/IOP period.[72]

92. Changes in salinity in the above mentioned estuaries could potentially negatively impact the marine fisheries that support commercial and recreational fishing in these areas of the Florida Bay. Exhibit 3-5 presents annual commercial fisheries landings and trips for Miami-Dade and Monroe Counties. There has been a general downward trend in the number of pounds landed and commercial trips made. These values are presented to provide context on the regional fisheries industry only. This analysis does not have enough information to estimate any potential changes in pounds landed or commercial trips made associated with implementation of the IOP. In addition, the relationship between salinity and fish stocks is not well understood, and a variety of other factors can also affect the fisheries.

**EXHIBIT 3-5 MIAMI-DADE AND MONROE COUNTIES COMMERCIAL FISHERIES LANDINGS AND TRIPS**

| YEAR | MIAMI-DADE | | MONROE | |
|---|---|---|---|---|
| | POUNDS | TRIPS | POUNDS | TRIPS |
| 2000 | 2,192,458 | 12,222 | 17,106,541 | 51,046 |
| 2001 | 1,601,585 | 11,170 | 14,078,777 | 44,252 |
| 2002 | 1,719,915 | 11,483 | 13,550,074 | 44,108 |
| 2003 | 1,314,006 | 8,513 | 14,126,773 | 45,081 |
| 2004 | 1,555,491 | 8,630 | 14,736,540 | 41,433 |
| 2005 | 1,778,097 | 8,159 | 13,083,710 | 35,811 |

Source: Florida Fish and Wildlife Conservation Commission, Marine Fisheries Information System. 2000 to 2005 Annual Landings Summaries, by County. Edited Landings Data Batch 900 through Batch 945. Accessible at: http://www.floridamarine.org/features/view_article.asp?id=19224 accessed May 1, 2007.

[69] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp. 29.

[70] National Park Service, 2005. An Assessment of the Interim Operational Plan. South Florida Natural Resources Center Everglades National Park; pp. 26-28.

[71] Paul Linton, P.E. Chief Consulting Engineer, South Florida Water Management District, January 02, 2007. Email sent toUS Fish and Wildlife Service Vero Beach, Florida Field Office.

[72] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; pp. 66.

#### 3.2.3.5 The IOP effects on recreation in the Everglades

93. The IOP can also potentially have an indirect effect on the recreational usage within Units 1 and 2 due to conservation efforts for Subpopulation A. For example, because the IOP maintains dry conditions in Subpopulation A during sparrow nesting season, it also affects the level of water in the wetlands in that area. Drier conditions can limit recreational opportunities in areas near western Shark River Slough in two ways. First, lower water levels can decrease the area navigable using airboats; second, extremely dry conditions can lead to increased fire hazards, which may lead park managers to restrict or ban usage of some areas.[73]

94. To the extent higher water levels in WCA-3A are a result of sparrow conservation efforts, the IOP may also contribute to a reduction in recreational opportunities in WCA-3A. During high water levels in WCA-3A both recreationists and wildlife compete for limited higher ground on tree-islands. To prevent additional stress on wildlife populations during high water level periods the FWC closes WCA-3A for recreation and cancels the hunting season. Deer hunting, duck hunting, and fishing are most affected by such closures.[74, 75] Note that recreational restrictions are most likely if high rainfall events (e.g., a hurricane) occur during the period when S-12 gates are closed and cannot be used to release excess water flowing south from WCA-3A.

95. The FWC estimates the hunting pressure during the different hunting seasons (e.g., archery, muzzle-loading, general gun-walk, and general gun-vehicle seasons) for deer-hunting in WCA-3A. Between 2001 and 2006, deer hunting pressure ranged from 0 hunting man-days in 2005 (when WCA-3A remained closed throughout the deer hunting season) to 821 hunting man-days in 2006.[76] No data related to duck hunting or fishing are available. Exhibit 3-6 presents the number of man-days of hunting for different hunting activities from 2001 to 2006 for the Everglades Wildlife Management Area within WCA-3A.

96. Water management actions taken under IOP may contribute to hunting closures in WCA-3A. To accurately estimate the impacts of such closures this analysis would determine lost opportunity costs of IOP water management actions. To estimate the lost opportunity costs this analysis would need information on the number of hunting trips reduced due to closures, and a measure of the decrease in quality of experience during the days when hunting is permitted but water levels are higher than they would be without IOP management actions. In the absence of such information, this analysis is unable to estimate the potential opportunity costs associated with reduced hunting opportunities in

[73] Personal communication with Jesse Kenon, Coopertown Airboat Tours, Coopertown, Florida, March 8, 2007.

[74] Personal communication with Timothy Towles, Florida Fish and Wildlife Conservation Commission, March 8, 2007.

[75] Personal communication with Marsha Ward, Biological Scientist, Everglades and Francis S. Taylor Wildlife Management Areas, Florida Fish and Wildlife Conservation Commission, April 30, 2007.

[76] Personal communication with Marsha Ward, Biological Scientist, Everglades and Francis S. Taylor Wildlife Management Areas, Florida Fish and Wildlife Conservation Commission, April 30, 2007.

WCA-3A associated with the water management actions implemented by the USACE under the IOP.

**EXHIBIT 3-6 DEER HUNTING MAN-DAYS (2001 – 2006) IN THE THE EVERGLADES WILDLIFE MANAGEMENT AREA**

| YEAR | ARCHERY | MUZZLE-LOADING | GENERAL GUN-WALK | GENERAL GUN-VEHICLE | TOTAL |
|---|---|---|---|---|---|
| 2001 | 14 | 20 | 36 | 442 | 512 |
| 2002 | 40 | 65 | 52 | 448 | 605 |
| 2003 | 120 | C | C | 424 | 544 |
| 2004 | 68 | C | C | C | 68 |
| 2005 | C | C | C | C | 0 |
| 2006 | 100 | C | 40 | 681 | 821 |

C: Closed for hunting season
Source: Personal communication with Marsha Ward, Biological Scientist, Everglades and Francis S. Taylor Wildlife Management Areas, Florida Fish and Wildlife Conservation Commission, April 30, 2007.

## 3.3 TIME PERIOD III: 2011 -2026

97. The IOP is expected to be in effect until the currently scheduled completion of the modified water deliveries and C-111 Projects by 2011. As described in Section 2, CSOP will supersede the IOP after the completion of the Tamiami Trail portions of the modified water deliveries project. CSOP is under development by the USACE, and will define the combined operations and management of the structures and operational plans originally developed for the Modified Water Deliveries and C-111 Projects. In addition to CSOP, the USACE and SFWMD are also responsible for implementing over 60 projects under CERP, which is dedicated to the complete restoration of the Everglades by 2050.[77] Several agencies and stakeholders have already expressed concerns that sparrow conservation efforts will determine the planning, implementation and operation of future water management and restoration projects, and may not be in concordance with the MSRP. MSRP is a multi-species ecosystem based recovery plan for the threatened and endangered species of South Florida. [78] Some assert its implementation could be threatened if sparrow conservation is promoted over the conservation of other species.[79] However, it should be noted that the MSRP does not contain any mechanisms to evaluate tradeoffs between species.

[77] Department of Environmental Protection (DEP), Florida, December 2006. Comments on the proposed rule for critical habitat designation for the Cape Sable seaside sparrow.

[78] US Fish and Wildlife Service, Southeast Region, 1999. South Florida Multi-Species Recovery Plan.

[79] Department of Environmental Protection (DEP), Florida, December 2006. Comments on the proposed rule for critical habitat designation for the Cape Sable seaside sparrow.

### 3.3.1 POTENTIAL FUTURE IMPACTS OF SPARROW CONSERVATION MEASURES

98. The Service expects that with the completion of the Modified Water Deliveries project and the implementation of the CSOP by 2011, sparrow conservation will become aligned with the overall Everglades restoration objectives. However, regardless of the success of planned projects, which are the basis for the Service's opinion, it is generally accepted that some modifications will have to be made to CSOP and CERP for purposes of sparrow conservation. Interagency meetings are already being held to discuss how to align sparrow protection measures with the long term plans of Everglades restoration, and flood protection in the C-111 project area. The following sub-sections summarize potential trade-offs in regard to future sparrow conservation efforts:

#### 3.3.1.1 Water management for the sparrow and CERP projects

99. The SFWMD, FWC, Florida Department of Environmental Protection, and the Miccosukee Tribe believe that the IOP, which is the specialized water management plan for conservation of the sparrow, is an indicator of how projects, such as the CSOP and CERP, will have to be modified in the future to conserve the sparrow and its habitat. Thus, there is some concern that sparrow conservation needs will lead to institutionalization of an "unnatural, specialized water management plan" as represented by the IOP. [80] Moreover, sparrow conservation plans may also reintroduce the need to maintain control structures that would otherwise be removed under CERP for restoring more natural hydrological flows. Another commonly voiced concern is that the Service has favored the sparrow over other species. Several stakeholders perceive the sparrow-focused water management plans as threatening to the overall ecology of the Everglades, and specifically to CERP's holistic multi-species recovery plan for the entire Everglades. For instance, the Florida Department of Environmental Protection has expressed that it would be "unacceptable for the Service's Jeopardy opinion to trump all of the other species" and requests the Service to "recognize the benefits of multi-species approach to implementation of Everglades restoration projects."[81]

#### 3.3.1.2 Freshwater flows to estuaries from Lake Okeechobee might increase in the future

100. Present day nutrient levels in Lake Okeechobee do not meet relevant water quality standards. Hence, flow from Lake Okeechobee, which would normally flow south under the topographic gradient, is artificially restricted from flowing into the Everglades. Instead freshwater flows from Lake Okeechobee are routed into estuaries through the St. Lucie and Caloosahatchee rivers (which flow to the east and west coasts of Florida, respectively). It is, however, expected that in the future nutrient levels will be reduced and water would be allowed to flow naturally from Lake Okeechobee to the Everglades. Stakeholders are concerned that, in the future, this natural flow of water will be precluded

[80] Terry Rice, Colonel (U.S. Army Ret'd). P.E.. December 21, 2006. Peer Review of the U.S. Fish and Wildlife Service Proposed Rule to Revise Critical Habitat, 50 CFR Part 17, Endangered and Threatened Wildlife and Plants; Critical Habitat Designation for the Cape Sable Seaside Sparrow; pp. 2.

[81] Department of Environmental Protection (DEP), Florida, December 2006. Comments on the proposed rule for critical habitat designation for the Cape Sable seaside sparrow.

due to water management activities for Subpopulation A (Units 1 and 2), and that the current practice of routing excess freshwater into estuaries will continue to upset the salinity balance within those estuaries on the eastern and western coast of South Florida.[82]

101. Note that these concerns are predicated on the assumption that current water management actions which close S-12 structures and prevent free flow of water between WCA-3A and western Shark River Slough will continue in the future as well. These conditions may change if the USACE's future plans are implemented which would enable more free flowing conditions near eastern Shark River Slough. Also, note that the SFWMD is considering building reservoirs near Lake Okeechobee to preclude increased freshwater flows into estuaries on the east and west coast of South Florida. The impact of sparrow conservation measures on the amount of freshwater releases to estuaries in the future is therefore uncertain. This analysis, therefore, cannot quantify any economic impacts related to water quality in the estuary.

#### 3.4.1.3 Water management plans for sparrow will require additional commitment of resources by agencies

102. Sparrow conservation efforts are expected to result in additional effort by management agencies (e.g., USACE, NPS, SFWMD, FWC) to consider alternative plans, and participate in more inter/intra agency meetings and coordination and delays in implementing projects, as has been experienced in the past. For example, the USACE is already spending resources experimenting with alternative plans that could modify the almost finalized CSOP to meet conservation requirements for sparrow Subpopulation A (Units 1 and 2).[83] Therefore agencies anticipate that they will need to allocate resources in the future for resolving concerns arising out of sparrow conservation measures. The amount of management resources that could potentially be allocated for sparrow conservation efforts is uncertain and cannot be quantified at this time.

## 3.4 POTENTIAL IMPACTS ON THE MICCOSUKEE TRIBE OF INDIANS OF FLORIDA

103. The Miccosukee Tribe of Indians of Florida can be affected by water management efforts for the conservation of the sparrow. While the Miccosukee Tribe does not own lands within the proposed critical habitat, cultural resources within ENP and tribal lands outside the park may be affected by sparrow conservation efforts. That is, the Tribe holds cultural and spiritual values associated with the Everglades, and any ecological changes to the Everglades as a result of water management for the sparrow can affect these values.

104. This section provides a background on the Tribe, including its socioeconomic status. Finally, it provides an overview of the impacts of sparrow conservation efforts on the Tribe by time period of this analysis.

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[82] Public comment letter submitted by Dexter W. Lehtinen of Lehtinen Vargas & Riedi Attorneys at Law on behalf of the Miccosukee Tribe of Indians of Florida on January 2, 2007.

[83] Personal communication with Timothy Towles, Florida Fish and Wildlife Conservation Commission, March 8, 2007.

### 3.4.1 BACKGROUND

105. The Everglades has been the home of the Miccosukee Tribe of Indians of Florida since the 1800's.[84] The Tribe lives in the 666 acres of the Miccosukee Reserved Area (MRA) on the northern boarder of ENP. The Tribe has an Alligator Alley Reservation comprised of 74,812 acres of mostly undeveloped Everglades located west of Ft. Lauderdale and south of Highway 84. In addition, the Tribe has a perpetual lease to 189,000 acres of Everglades in WCA-3A under the Indian Land Claims Settlement Act of 1982. This lease requires that these lands be preserved in their natural state in perpetuity for the benefit and use of the Tribe. This is one of the areas the Tribe practices its religion and traditional way of life.

106. Socioeconomic data, provided in Exhibit 3-7, demonstrates the economic vulnerability of the Tribe. Total tribal enrollment is 550, with 72 persons residing on the reservation. The per capita personal income is approximately $5,500.

**EXHIBIT 3-7 MICCOSUKEE TRIBE OF INDIANS OF FLORIDA SOCIOECONOMIC INFORMATION**

| AREA/TRIBAL LANDS | TOTAL AREA (ACRES) [A] | TRIBAL ENROLLMENT [A] | RESERVATION POPULATION [B] | PER CAPITA INCOME [B] |
|---|---|---|---|---|
| Miccosukee Reserved Area | 666 | 492 | 72 | $5,462 |
| Alligator Alley Reservation | 74,812 | | | |
| Krome Avenue Reservation | 26 | | | |
| Perpetual Lease | 189,000 | | | |
| Total | 264,504 | | | |

Sources:
A Miccosukee Tribe of Indians of Florida. A Glimpse at the Miccosukee Tribe of Indians of Florida: Twelve Frequently Asked Questions. Provided by Joette Lorian January 23, 2007.
B Tiller, Veronica E. Velarde. 1996. Tiller's Guide to Indian Country: Economic Profiles of American Indian Reservations. BowArrow Publishing Company, Albuquerque, New Mexico.

### 3.4.1 SUMMARY OF TRIBE'S CONCERNS

107. The Tribe feels that it is its duty to protect the Everglades and has invested resources and used its sovereign status to protect the Everglades. Notably the Tribe has engaged in multiple lawsuits to protect the Everglades, including pursuing litigation related to wildlife preservation and water quality. During Time Period I (1967 - 1995) sparrow conservation efforts and tribal interests largely overlapped.

108. The Tribe began to disagree with water management for the sparrow in 1995, with the Service's jeopardy decision for Test 7 of the experimental program. The Tribe filed a lawsuit in 2002 to restrict IOP implementation, alleging violations of several federal laws

[84] Miccosukee Tribe of Indians of Florida. A Glimpse at the Miccosukee Tribe of Indians of Florida: Twelve Frequently Asked Questions. Provided by Joette Lorian January 23, 2007.

and acts.[85] The court, however, dismissed most of the Tribe's claims in its April, 2003 decision, but asked the USACE to provide a supplement its NEPA analysis of the Alternative 7R.

109. The Tribe contends that water management actions for the sparrow after this point "have resulted in irreversible environmental destruction to Tribal Everglades lands in WCA 3A and has caused increased flooding that has degraded other natural areas" outside of proposed critical habitat.[86] That is, by maintaining low water levels in Units 1 and 2 during sparrow nesting season, water levels in WCA-3A are maintained at unnaturally high levels. In its comment letter on the Proposed Rule the Miccosukee Tribe has strongly objected to the manipulation of water levels in western Subpopulation A area (Units 1 and 2). It perceives the proposed rule to be institutionalizing "water management actions that have had a significant and adverse impact on the Miccosukee Tribal Everglades in WCA-3A and other parts of the ecosystem."

110. This section has previously identified most of the Tribe's concerns in the earlier discussion on the economic and ecological impact of water management plans for sparrow conservation. The specific concerns raised by the Tribe are summarized below:[87]

- Flooding and irreversible degradation of tree-islands in WCA-3A, which is the last expanse of sawgrass Everglades left in existence, threatens the Tribe's culture and way of life and biodiversity;
- Injury and jeopardy to endangered species including the Snail Kite whose population has been estimated to have declined by 50 percent during ISOP/IOP years;
- Decrease in the biodiversity of the Everglades because of threats posed to the multi-species ecosystem restoration objectives;
- The negative impact on overall Everglades restoration due to delay in implementation of the MWD Project;
- Adverse impact to the water quality in estuaries in the Florida Bay due to changes in volume, and timing of freshwater flows into the estuaries;
- Exacerbation of high water levels in Lake Okeechobee due to higher water levels in WCA-3A resulting from closure of S-12 structures could negatively affect tourism in the area;
- Adverse impacts to the Caloosahatchee and St. Lucie estuaries;
- Increased flooding of residential and agricultural areas due to the routing of water through the South Dade Conveyance System.

[85] US Army Corps of Engineers, 2006: Final Supplemental Environmental Impact Statement; Interim Operational Plan for Protection of Cape Sable Seaside Sparrow; Executive Summary.

[86] Public comment letter submitted by Dexter W. Lehtinen of Lehtinen Vargas & Riedi Attorneys at Law on behalf of the Miccosukee Tribe of Indians of Florida on January 2, 2007.

[87] Ibid.

- IOP will lead to a permanence of water management structures and operational plans that will maintain Subpopulation A habitat at unnaturally dry levels as would be the case under the CERP.

Thus the Tribe is opposed to actions that increase the likelihood of losing their traditional ecological resources due to water management for sparrow conservation. Consequently, the Tribal concerns related to water management in the Everglades are mainly related to Subpopulation A (Units 1 and 2).

111. Finally, it should be noted that although other stakeholders share some of the Tribe's concerns, the Tribe's positions on some issues are the subject of ongoing litigation and debate.

# SECTION 4 | ECONOMIC IMPACTS TO OTHER ACTIVITIES

112. Landowners and managers including NPS and FWC, which are responsible for managing the natural resources within Everglades National Park and Big Cypress National Preserve, and Southern Glades Wildlife and Environmental Area, respectively, routinely undertake sparrow conservation efforts. Species management efforts may include surveying and monitoring, fire management, and exotic vegetation control. In addition, sparrow conservation efforts may limit recreational opportunities such as sightseeing, camping, and hunting in these public areas. This section summarizes species management efforts undertaken for sparrow including surveying and monitoring, fire management, and exotic vegetation control, and presents the costs of these efforts. This section also discusses potential impacts related to changes in recreational opportunities associated with sparrow conservation efforts.

## 4.1 SUMMARY

### 4.1.1 PRE-DESIGNATION COSTS

113. Pre-designation costs of sparrow conservation efforts related to other activities have resulted from sparrow surveying and monitoring, conducting studies on the impact of sparrow management on other species (e.g., Everglades snail kite), exotic vegetation control, and fire management within the ENP. Exhibit 4-1 presents the total pre-designation impact of these activities undertaken for sparrow conservation between 1992 and 2006.[88] The Service, NPS, FWC, and the USACE have incurred a total cost of $22.6 million (discounted at three percent) related to other activities as mentioned above.

### 4.1.2 POST DESIGNATION COSTS

114. Post-designation costs of sparrow conservation efforts are expected to arise from continued sparrow surveying and monitoring efforts, exotic vegetation control, and fire management for the sparrow. The NPS is expected to incur most of these future costs related to species and fire management efforts. Exhibit 4-2 presents the total post-designation impacts of these activities, as estimated for the next 20 years. Total post-designation impacts to other activities are estimated to be $17.6 million (discounted at three percent).

[88] For the period prior to 1992, conservation related costs for other activities are not known to this analysis.

**EXHIBIT 4-1 TOTAL PRE-DESIGNATION IMPACTS TO OTHER ACTIVITIES**

| UNIT | UNDISCOUNTED | PRESENT VALUE (3 PERCENT) | PRESENT VALUE (7 PERCENT) |
|---|---|---|---|
| 1: Subpopulation A Marl Prairies | $4,350,000 | $4,870,000 | $5,660,000 |
| 2: Subpopulation A Cordgrass Marshes | $2,410,000 | $2,670,000 | $3,090,000 |
| 3: Subpopulation B | $2,850,000 | $3,210,000 | $3,770,000 |
| 4: Subpopulation C | $2,410,000 | $2,670,000 | $3,090,000 |
| 5: Subpopulation D | $2,530,000 | $2,810,000 | $3,240,000 |
| 6: Subpopulation E | $2,850,000 | $3,210,000 | $3,770,000 |
| 7: Subpopulation F | $2,850,000 | $3,210,000 | $3,770,000 |
| **Total** | **$20,300,000** | **$22,600,000** | **$26,400,000** |

**EXHIBIT 4-2 TOTAL POST-DESIGNATION IMPACTS TO OTHER ACTIVITIES**

| UNIT | UNDISCOUNTED | PRESENT VALUE (3 PERCENT) | PRESENT VALUE (7 PERCENT) |
|---|---|---|---|
| 1: Subpopulation A Marl Prairies | $2,880,000 | $2,300,000 | $1,810,000 |
| 2: Subpopulation A Cordgrass Marshes | $2,880,000 | $2,300,000 | $1,810,000 |
| 3: Subpopulation B | $3,540,000 | $2,770,000 | $2,110,000 |
| 4: Subpopulation C | $2,730,000 | $2,150,000 | $1,660,000 |
| 5: Subpopulation D | $3,210,000 | $2,510,000 | $1,910,000 |
| 6: Subpopulation E | $3,540,000 | $2,770,000 | $2,110,000 |
| 7: Subpopulation F | $3,540,000 | $2,770,000 | $2,110,000 |
| **Total** | **$22,300,000** | **$17,600,000** | **$13,500,000** |

## 4.2 IMPACT TO SPECIES MANAGEMENT

115. The Service, USACE, NPS, and FWC have and are expected to continue conducting monitoring, planning, research, and exotic vegetation control for the sparrow. The costs presented in this section were obtained through stakeholder interviews, and represent past and likely future species management activities. As shown in Exhibit 4-3, the NPS, and the USACE have incurred most of the costs due to species management projects in the

past. Total post-designation costs related to species management are estimated to be $15.7 million over the next 20 years, and will be mostly incurred by the NPS.[89]

**EXHIBIT 4-3 SUMMARY OF PRE- AND POST- DESIGNATION COSTS INCURRED FOR SPECIES MANAGEMENT (DISCOUNTED AT THREE PERCENT)**

| AGENCY | PRE-DESIGNATION COSTS | POST-DESIGNATION COSTS |
|---|---|---|
| Service | $3,910,000 | $1,590,000 |
| NPS | $10,700,000 | $12,900,000 |
| USACE | $6,290,000 | $898,000 |
| FWC | $137,000 | $358,000 |
| **Total** | **$21,000,000** | **$15,700,000** |

### 4.2.1 U.S. FISH AND WILDLIFE SERVICE

116. The Service conducts monitoring, planning, research, and management for the sparrow. Between 2000 and 2006, the Service spent an estimated $2.65 million (discounted at three percent) in staff time on such efforts. Based on past efforts, the Service projects that another $1.6 million in staff time will be spent between 2007 and 2011.[90] In addition, the Service funds research and monitoring surveys through multiple grant agreements. Funds have been made available for such activities since 1995. [91] It is estimated that between 1996 and 2006, in the pre-designation period, the Service has spent $1.25 million in species research and monitoring efforts. Future costs that may be spent on research and monitoring are expected to be less than past efforts but are unknown at this time. [92]

### 4.2.2 NATIONAL PARK SERVICE

117. The ENP administers contracts for monitoring the sparrow and its habitat within the ENP and BCNP. The NPS staff coordinates with the Service to survey and monitor habitat for the sparrow in all subpopulation regions. The NPS has been incurring costs related to species management since 1992, when it started conducting helicopter surveys. In the pre-designation period, between 1992 and 2006, the NPS is estimated to have spent in excess of $10.7 million (discounted at three percent). It expects to spend another $12.9

[89] Also note that according to the NPS, although these estimates represent the majority of the expected costs, some additional (unquantifiable) species management costs have been incurred in the past and will be incurred in the future. Hence the estimates provided in this section for the NPS are most likely underestimate the true costs.

[90] Personal communication with US Fish and Wildlife Service, Vero Beach Field Office personnel, January 25, 2007. (Costs are estimated based on 2006 GS Rates).

[91] Personal communication with US Fish and Wildlife Service, Vero Beach Field Office personnel, January 25, 2007.

[92] Personal communication with US Fish and Wildlife Service, Vero Beach Field Office personnel, April 25, 2007.

million in the post-designation period between 2007 and 2026.[93] Exhibit 4-4 summarizes the costs for the different management activities for the pre-designation and post-designation periods.

118. The BCNP has also identified as high priority the need for research to assess the impact of airboats on sparrow habitat. The estimated cost for such a study was $300,000 in 2000.[94] While it is not known if and when this study will be conducted, this analysis assumes it will be conducted in 2007.[95]

**EXHIBIT 4-4 ESTIMATED EXPENDITURE INCURRED FOR SPECIES MANAGEMENT BY NPS**

| ACTIVITY | PRE-DESIGNATION COSTS (DISCOUNTED AT 3%) | POST-DESIGNATION COSTS (DISCOUNTED AT 3%) |
|---|---|---|
| Administrative effort (i.e., staff time) | $1,500,000 | $2,910,000 |
| Research and monitoring | $1,970,000 | $4,130,000 |
| Helicopter surveys | $1,250,000 | $996,000 |
| Exotic Vegetation Control | $5,360,000 | $3,700,000 |
| Hydrological modeling and analysis | $592,000 | $1,150,000 |
| **Total** | **$10,700,000** | **$12,900,000** |
| Note: Totals may not be accurate due to rounding | | |

### 4.2.3 US ARMY CORPS OF ENGINEERS

119. The USACE estimates that it spent $1.5 million (discounted at three percent) on inventorying, surveying, and monitoring efforts for the sparrow between 1995 and 2006. It also spent $1.2 million (discounted at three percent) on general species management programs implemented in 2001 through 2004. Implementation of sparrow habitat protection measures cost the USACE $2.0 million in 2006. In addition, the USACE has been funding studies on the Everglades Snail Kite, whose critical habitat in the WCA-3A region is affected by water management actions undertaken for sparrow conservation. Between 2003 and 2006, the USACE spent an estimated $757,000 (discounted at three percent) on such studies. Separately, as part of efforts to mitigate impacts of water management operations on ENP, in 2002 the USACE provided the NPS $660,000 to remove exotic vegetative species from sparrow habitat within the park. NPS undertook efforts to remove non-native vegetation in sparrow habitat from 2002 to 2004.[96] The

[93] Personal communication with Dave Hallac, Biology Branch Chief, Everglades National Park, April 3 and 25, 2007.

[94] Big Cypress National Preserve, Florida, 2000. Final Off-Road Vehicle Management Plan: Supplemental Environmental Impact Statement.

[95] It is assumed that this study will be conducted in 2007 to minimize the impact of discounting.

[96] Personal communication with Jon Moulding, Jacksonville District US Army Corps of Engineers, January 16, 2007.

USACE incurred a total of approximately $6.3 million (discounted at three percent) since 1995. The USACE will continue to monitor sparrow habitat in the future, and expects to spend $1.0 million (discounted at three percent) from 2007 to 2011 for sparrow monitoring purposes.

#### 4.2.4 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

120. The FWC conducts annual surveys in the Southern Glades Wildlife and Environmental Area for Subpopulation D, which experienced a dramatic decrease in sparrow numbers after 1992. The FWC staff monitors sparrow numbers using the aid of a helicopter. The FWC estimates that between 2002 and 2006 it spent an estimated $137,000 (discounted at three percent) in survey costs for Subpopulation D (Unit 5) in Southern Glades.[97] While the FWC will not conduct the survey in 2007, species monitoring may be undertaken in the future. This analysis assumes surveying costs may be up to $358,000 (discounted at three percent) if FWC conducts sparrow monitoring efforts each year for the next 20 years.

## 4.3 IMPACT TO FIRE MANAGEMENT

121. Approximately 60 percent of the ENP supports vegetation that is prone to fire. Once burnt, the vegetation grows rapidly to again become available as "fuel" for fires within two years. The sparrow's habitat lies within the fire prone regions of the ENP. According to the Service, Subpopulations B and F (Units 3 and 7) are the most vulnerable to fire, while Subpopulation E (Unit 6) has lower likelihood of experiencing fires because it is remote from park boundaries where anthropogenic fires have the highest likelihood of starting. Although the area around proposed critical habitat Unit 2 is not prone to fires, prescribed burn plans have also been implemented in that area.[98]

122. Most fire management actions in the ENP therefore have to consider the impact on the sparrow.[99] For example, naturally occurring and anthropogenic fires may require suppression actions specifically for the sparrow; burn plans, even if planned for other purposes, often need to implement measures to protect sparrow. Burn plans are also carried out specifically for conservation of the sparrow. During periods of extreme drought, additional firefighters and aircrafts may also be provided to the fire stations under a "Severity Funding" program; in the past a considerable proportion of the funding was allocated for suppression actions for the sparrow.

123. The East Everglades Fire Station is the primary fire management unit of the NPS that is involved in fire management activities affecting sparrow habitat. Its site was chosen

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[97] Personal communication with Michael Anderson, Florida Fish and Wildlife Conservation Commission, March 7, 2007.

[98] Personal communication with US Fish and Wildlife Service, Vero Beach Field Office personnel, January 25, 2007.

[99] Personal communication with Bob Panko, Fire Management Officer, East Everglades Fire Station, National Park Service, March 16, 2007.

specifically to help in fire management for sparrow conservation. Sparrow conservation now influences most operations of this fire station.[100]

124. The NPS has been involved in fire management for the sparrow since the 1970's. Since 1995-1996, most of the East Everglades fire station staff has been spending a considerable amount of its time on sparrow conservation efforts.[101] The NPS estimates that between 1995 and 2006 it spent $1.6 million (discounted at three percent) specifically for sparrow conservation related fire management. This amount was obtained through special grants and from the federal government funding provided for the overall day to day operations of the fire station. Fire management efforts for the sparrow are expected to continue with similar intensity in the future. Therefore, this analysis estimates that the NPS will spend an estimated $1.9 million (discounted at three percent) from 2007 to 2026 on fire management efforts for conservation of the sparrow.

125. In addition to these amounts, in 2002 the USACE provided the NPS with $40,000 for prescribed burns to mitigate the impacts of water management for Subpopulation A in Unit 1. NPS spent this amount between 2002 and 2004.[102] The NPS also conducts an annual symposium on fire management and sparrow conservation. The symposium is an avenue for a collective assessment of studies, which assess the relationships between fires and the re-habitation of burnt areas by the sparrow. Costs associated with the symposium are not available to this analysis. Exhibit 4-5 summarizes the costs incurred for fire management for sparrow conservation in the past, and costs estimated to be incurred in the next 20 years.

**EXHIBIT 4-5 SUMMARY OF TOTAL COSTS RELATED TO FIRE MANAGEMENT FOR SPARROW CONSERVATION**

| AGENCY | PRE-DESIGNATION COSTS | POST-DESIGNATION COSTS |
|---|---|---|
| NPS | $1,600,000 | $1,860,000 |
| USACE | $45,000 | $0 |
| **Total** | **$1,645,000** | **$1,860,000** |

## 4.4 IMPACT TO RECREATION AND RELATED ACTIVITIES

126. Public motorized recreation (or recreation facilitated by motorized vehicles) is allowed in the East Everglades Expansion Area (Expansion Area) within the ENP, Stairsteps region (within Zone 4) of the BCNP, and the Southern Glades Wildlife and Environmental Area

[100] Personal communication with Bob Panko, Fire Management Officer, East Everglades Fire Station, National Park Service, March 16, 2007.

[101] Personal communication with Bob Panko, Fire Management Officer, East Everglades Fire Station, National Park Service, March 16, 2007.

[102] Personal communication with Jon Moulding, Jacksonville District US Army Corps of Engineers, January 16, 2007.

to the east of the ENP.[103] Note that motorized vehicles are not allowed in most other areas within the ENP, under the auspices of the 1964 Wilderness Act. Within the BCNP public motorized access is limited to designated trails. [104] Within the Southern Glades area vehicles are restricted to named and numbered roads, and all off-road vehicles are prohibited except the use of airboats in some areas between December 4 and March 1.[105]

127. Recreation may also be affected in areas surrounding the proposed critical habitat. In WCA-3A, high water levels may lead to the imposition of restrictions on recreation (i.e., hunting and camping) in some areas, to protect endangered and threatened species. Restrictions are imposed to prevent people from occupying areas that might be utilized as refuge by the animals looking for higher ground. Changes in hydrological management lead to different water levels in the WCA-3A area, and therefore also affect the amount of area available for recreation.

### 4.4.1 EAST EVERGLADES EXPANSION AREA

128. In 1989 the Congress passed the Everglades National Park Protection and Expansion Act. Its purpose is to restore and protect critical wetlands and restore the hydrology of the Northeast Shark River Slough in western Miami-Dade County. Congress authorized an expansion of the park's boundaries to include 109,600 acres of these wetlands."[106] The Expansion Area is located in the northeast corner of the ENP. More than 95 percent of the lands have been purchased and designated as public lands. No hunting is permitted in either these lands or in the rest of the ENP. In the remaining private lands, the FWC is responsible for enforcing hunting activities.

129. The Expansion Area is the only area where airboating is allowed within ENP. However, it is limited to those private airboat owners who owned property within the Expansion Area, and have acquired grandfathered rights to use the area.[107] The Miccosukee Tribe also has limited access to this area. Most areas in the ENP, which lie outside of the Expansion Area are designated as wilderness; no public motorized access is allowed in the wilderness designated areas within ENP. [108]

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[103] Personal communication with Jon Moulding, Jacksonville District US Army Corps of Engineers, January 16, 2007.

[104] National Park Service, 2003. Annual Wilderness Report 2002-2003.

[105] Florida Fish and Wildlife Conservation Commission, 2006. Southern Glades Wildlife and Environmental Area, 2006-2007 Regulations Summary and Area Map. Last accessed on April 26, 2007 at http://myfwc.com/hunting/wma/2006-07/South/SOUTHERN_GLADES.pdf.

[106] Everglades National Park, Press Release on September 18, 2001. Last accessed on April 26, 2007 at <http://www.nps.gov/archive/ever/current/pr010918.htm>

[107] Personal communication with Dave Hallac, Biology Branch Chief, and Fred Herling, Park Planner, Everglades National Park Meeting January 23, 2007.

[108] Personal communication with Dave Hallac, Biology Branch Chief; Fred Herling, Park Planner, Everglades National Park Meeting January 23, 2007.

130. The ENP states that because hydrological conditions currently limit air boating within Unit 7, and because airboaters and the Miccosukee Tribe have been granted limited access in lieu of the 1989 Expansion Act, any incremental impact on recreation due to sparrow conservation is expected to be negligible in the Expansion Area. It is expected that in the future with the implementation of the Everglades restoration projects, this area will become more amenable to airboating. However, because Subpopulation F (Unit 7) is located in the Expansion Area, some recreation groups are concerned that sparrow conservation efforts will limit recreational opportunities in this area. While the number of trips is not expected to change much, it maybe the case that visitors' experiences maybe affected due to additional restrictions arising out of sparrow conservation efforts.

131. Note that some stakeholders such as the Everglades Coordination Council also argue that as hydrological conditions improve with park restoration in the future, more recreation should be allowed in the Expansion Area. It is uncertain whether such demands will be met in the future, and if sparrow conservation efforts will have any impact on the facilitation of such demands.

### 4.4.2 BIG CYPRESS NATIONAL PRESERVE

#### 4.4.2.1 Background[109]

132. The Stairsteps within the BCNP is the only area that overlaps with proposed critical habitat (Units 1 and 2). Recreation is an important activity within the preserve. Off-road vehicles (ORV) are the primary means of access used in the BCNP for recreation. ORV use includes airboats (13 percent), swamp buggies (30 percent), all-terrain cycles (39 percent), and some street-legal four wheelers (used only in the driest areas of the preserve) (18 percent). Airboats are the only means of access in areas where the sparrow habitat is found. On average, 74 airboat permits have been issued annually in the past for hunting within the Stairsteps region of the BCNP.[110]

133. Prior to using ORVs for recreation within the preserve, permits are needed for ORV vehicles, ORV operators, and for backcountry recreation. Only vehicle permits require payment of an annual fee; operator and backcountry permits can be obtained free of cost. The most direct, visible, and lasting impact of ORV use in BCNP is soil disturbance. Hence, the general management plan of the NPS currently limits the number of recreational ORV permits to 2,500 in a year. Visitors have to therefore obtain vehicle permits through a random drawing system.

134. Hunting within the BCNP is also regulated through a permit system. Three thousand hunting permits are available annually to the public for hunting the BCNP. According to the BCNP, hunting permits have not been exhausted in the past and are not likely to be

[109] Big Cypress National Preserve, Florida, 2000. Final Off-Road Vehicle Management Plan: Supplemental Environmental Impact Statement.

[110] Airboat use is not permitted in other areas of the BCNP.

exhausted in the future either. In 2006, 1,706 hunting permits were claimed, of which 1,294 permits were ultimately used.

#### 4.4.2.2 Impact on visitors

135. Wheeled vehicles are not allowed within areas that have been identified as sparrow habitat areas. Since ORVs may affect the vegetative structure required by sparrows for foraging, nesting, and roosting, administrative actions can prohibit airboats when and where water levels are at a stage in which their use may cause soil displacement. These management actions can therefore limit airboat use during the sparrow nesting season. The long-term effects of airboats on sparrow habitat and their behavior outside the nesting season have not been examined.

136. Recreation groups have expressed concerns that although the critical habitat designation will not directly add to the existing restrictions on public access, it may be used in the future to support litigation to reduce recreational access within Zone 4 of BCNP. Sparrow management in the area proposed currently as critical habitat Unit 1 has led to closure of areas and limited access to some area via designated trail paths only. Thus, if the proposed rule is finalized, it is believed that the ruling will be used to similarly limit access to the natural resources within Unit 2.[111]

137. The BCNP agrees that sparrow conservation efforts have limited recreation within Zone 4 in the past by closing off areas and restricting access through designated trails, and could continue to do so in the future. If Units 1 and 2 are designated as critical habitat, evaluations of recreational access to these areas may be more rigorous, especially during sparrow nesting season. This may inconvenience visitors as additional areas may be closed off permanently, or temporarily during nesting season; alternatively, access to some areas could be restricted to designated trail paths only. Some reduction in the number of hunting days and frogging opportunities may also result; walking distances may also increase slightly for hunters.

138. The BCNP, however, states that the magnitude of the impact associated with these changes on visitors to BCNP is likely to be minimal.[112] This is because most of the restrictions on recreation with ORVs within BCNP have already been instituted in response to the settlement agreement negotiated between the Florida Biodiversity Project and the U.S. Department of the Interior, NPS, the Service, U.S. Environmental Protection Agency, U.S. Department of the Army, and USACE. [113] The agreement was on the appropriate usage of ORVs without damaging the environmental resources of the preserve. Also, because hunting permit demands have been less than the quota allowed, impacts to hunting are also cited as minimal, and related only to changes in access points

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[111] Eric Kimmel, November 14, 2006. Comments for the Public Record on proposed rule 50 CFR part 17 Critical Habitat Designation for the Cape Sable Sparrow (emailed to Tylan Dean, Biologist, USFWS).

[112] Personal communication with Ron Clarke, Resource Management Chief, Big Cypress National Preserve, March, 8 2007.

[113] Big Cypress National Preserve, Florida, 2000. Final Off-Road Vehicle Management Plan: Supplemental Environmental Impact Statement.

and trail paths (i.e., number of trips will not be affected but the quality of experience maybe affected).

139. BCNP also suggests some potential benefits may accrue to visitors due to sparrow conservation measures. For example, habitat designation may increase the priority of research on impact of ORV use on sparrow habitat. If the BCNP had better scientific evidence, it may open up currently restricted areas in the future. Without such evidence, the BCNP uses a precautionary approach to protect the sparrow.[114] Another potential benefit that may result from sparrow conservation efforts is enhanced experience for non-motorized visitors due to a reduction in the number of total visitors and a reduction in the number of ORVs being used. Examples of benefits that could be realized include better soil conditions, more noticeable wildlife, and reduce conflicts between different user groups trying to enjoy the solitude of natural resources.[115]

#### 4.4.2.3 Impact on BCNP revenues

140. The BCNP could experience a minor reduction in revenue (earned out of vehicle permits) due to designation of Units 1 and 2, which could potentially result in more restricted access to these areas. The decrease in the number of visitors could also lead to a reduction in local spending on services supporting recreation within BCNP. However, the BCNP expects such reductions (if they were to occur) to be a negligible proportion of the total revenue.

141. Because not much is known about how the BCNP will implement sparrow conservation efforts, this analysis is unable to quantitatively assess the nature and magnitude of the impacts on BCNP revenues.

#### 4.4.2.4 Impact on local economy

142. The local economy may be affected negatively if drier conditions being maintained for the conservation of the sparrow within Units 1 and 2 (Subpopulation A) reduce the number of days for which airboats can be used in the area..[116] The reduced opportunities for airboat recreation may be most noticeable in a drought year, when the water table is naturally low, and sparrow management causes it to be lowered additionally. It is, however, difficult to quantitatively assess the degree of contribution of water management actions to the lowering of the water table. Although it is beyond the scope of this analysis to accurately estimate the impact of recreational opportunities lost due to sparrow conservation, it is expected that the impacts will potentially be modest.

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[114] Personal communication with Ron Clarke, Resource Management Chief, Big Cypress National Preserve, March, 8 2007.

[115] Big Cypress National Preserve, Florida, 2000. Final Off-Road Vehicle Management Plan: Supplemental Environmental Impact Statement.

[116] Personal communication with Jesse Kennon (owner of Coopertown-The Original Airboat Tour) on March 8, 2007.

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# APPENDIX A | ADMINISTRATIVE COSTS

143. This appendix presents administrative costs of actions taken under section 7 of the Act associated with the geographic area proposed as critical habitat for the sparrow. First, this Appendix defines the types of administrative costs likely to be associated with the proposed habitat. Next, the Appendix presents estimates of the number of technical assistance efforts and consultations likely to result from the designation of critical habitat and/or the listing of the sparrow, as well as the per-unit costs of each of these activities. Based on this analysis, estimates of past and future administrative costs are derived.

## A.1 CATEGORIES OF ADMINISTRATIVE COSTS

144. The following section provides an overview of the categories of administrative cost impacts that arise due to the implementation of section 7 in the geographic area proposed as critical habitat for the sparrow.

### TECHNICAL ASSISTANCE

145. Frequently, the Service responds to requests for technical assistance from State agencies, local municipalities, and private landowners and developers who may have questions regarding whether specific activities may affect critical habitat. Technical assistance costs represent the estimated economic costs of informational conversations between these entities and the Service regarding the designation of critical habitat for the sparrow. Most likely, such conversations will occur between municipal or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat. The Service's technical assistance activities are voluntary and generally occur in instances where a Federal nexus does not exist.

### SECTION 7 CONSULTATIONS

146. Section 7(a)(2) of the Act requires Federal agencies (Action agencies) to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. There are two scenarios under which the designation of critical habitat can result in section 7 consultations with the Service beyond those required by the listing. These include:

- New consultations, which can occur when activities involving a Federal nexus are proposed in critical habitat not thought to be currently occupied by the species; and
- Re-initiations of consultations, which result when consultations that previously occurred under the listing are re-initiated due to new information or circumstances generated by the designation.

In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers. More often, they will also include a third party involved in projects on non-Federal lands with a Federal nexus, such as State agencies and private landowners.

147. During a consultation, the Service, the Action agency, and the landowner manager applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the activity that has been proposed, the Federal agency, and whether there is a private applicant involved.

148. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussion between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat. The process is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

## A.2 ESTIMATED COSTS OF CONSULTATIONS AND TECHNICAL ASSISTANCE

149. Estimates of the cost of an individual consultation and technical assistance request were developed from a review and analysis of historical section 7 files from a number of Service field offices around the country conducted in 2002. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies.

150. The administrative costs estimates presented in this section take into consideration the level of effort of the Service, the Action agency, and the applicant, as well as the varying complexity of the consultation or the technical assistance request. Costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and the development of a biological opinion. Exhibit A-1 provides a summary of the estimated administrative costs of consultations and technical assistance requests. All costs are presented in 2006 dollars.

**EXHIBIT A-1. ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS (PER EFFORT) $2006**

| CONSULTATION TYPE | SERVICE | ACTION AGENCY | THIRD PARTY | TOTAL |
|---|---|---|---|---|
| Technical Assistance | $520 | n/a | $1,050 | $1,500 |
| Informal Consultation | $2,250 | $2,900 | $2,050 | $7,500 |
| Formal Consultation | $5,050 | $5,750 | $3,500 | $14,500 |

Source: IEc analysis based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2002, a review of consultation records from several Service field offices across the country. Confirmed by local Action agencies.
Note: Estimates primarily reflect staff wages and time involvement.

## A.3 SUMMARY OF PAST ADMINISTRATIVE COSTS

151. Since the listing of the sparrow there have been eight formal section 7 consultations in the geographic area proposed as critical habitat, and over the past eight years there have been on average of two informal and 10 technical assistance consultations per year. The formal consultations addressed major water management operations as related to the sparrow. The informal consultations addressed deviations to existing hydrologic management plans, potential effects of construction projects in and adjacent to sparrow habitat (e.g., levee maintenance, installation and maintenance of water control structures and bridges), and installation of wells and water monitoring gauges. The technical assistance consultations addressed inquiries about sparrow responses to habitat management, appropriate methods to survey for sparrows in areas of potential habitat or in areas where potential future impacts may occur, providing information about sparrow biology to resource managers, and similar activities.

152. As shown in Exhibit A-2, past administrative costs are estimated at $356,000. Administrative costs resulting from past formal consultations are estimated to have been $116,000 while informal consultations are estimated to have cost $120,000, and technical assistance consultations are also estimated to have cost $120,000. The Service notes that due to the controversial nature and complexity of several of the past formal consultations related to water management, the actual costs incurred are likely higher than these average estimates.

## A.4 SUMMARY OF FUTURE ADMINISTRATIVE COSTS

153. This analysis includes costs of consultation for the activities as indicated by action agencies. This analysis estimates at least four formal consultations will be conducted for sparrow over the next 20 years. As discussed in Sections 3 and 4 these include consultations on the ENP general management plan, WCA-3 Decompartmentalization and Sheetflow Enhancement project, C-111 Spreader Canal project, and CSOP. As shown in Exhibit A-3, future administrative costs are estimated at $58,000. In addition, the Service estimates two informal and 10 technical assistance consultations per year will

take place for the sparrow in the future. As shown in Exhibit A-3, future costs are estimated at $300,000 for each of the two categories of consultation.

## A.5 CAVEATS

154. The number of consultations and technical assistance efforts to be undertaken in the future for activities within a given complex is highly uncertain. The frequency of such efforts will be related to the level of economic activity, the presence of HCPs or other regional plans that obviate the need for consultation, and the extent to which economic activity overlaps with critical habitat. To the extent that this analysis over or underestimates the number of these efforts in the future, estimated costs will be over or understated.

**EXHIBIT A-2. PAST ADMINISTRATIVE COSTS BY UNIT AND BY ACTIVITY, 1967-2006, $2006**

| UNIT | TYPE OF CONSULTATION | WATER MANAGEMENT | OTHER (SPECIES AND FIRE MANAGEMENT) | TOTAL NUMBER | TOTAL COSTS |
|---|---|---|---|---|---|
| Unit 1 | Formal | 4.0 | 0.6 | 4.6 | $66,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *18.7* | *$103,000* |
| Unit 2 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *14.7* | *$45,000* |
| Unit 3 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 0.0 | 0.0 | 0.0 | $0 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $86,000 |
| | *Subtotal* | | | *12.0* | *$94,000* |
| Unit 4 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *14.7* | *$45,000* |
| Unit 5 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *14.7* | *$45,000* |
| Unit 6 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *14.7* | *$45,000* |
| Unit 7 | Formal | 0.0 | 0.6 | 0.6 | $8,000 |
| | Informal | 3.0 | 0.0 | 3.0 | $20,000 |
| | Technical Assistance | 0.0 | 11.4 | 11.4 | $17,000 |
| | *Subtotal* | | | *14.7* | *$45,000* |
| Proposed Critical Habitat | Formal | 4.0 | 4.0 | 8.0 | $116,000 |
| | Informal | 16.0 | 0.0 | 16.0 | $120,000 |
| | Technical Assistance | 0.0 | 80.0 | 80.0 | $120,000 |
| | **Total** | | | **104.0** | **$356,000** |

Note: (1) Totals may not sum due to rounding. (2) Consultations may be undertaken for activities that span more than one unit; thus, some numbers of consultations totals show fractions (e.g., three units may show a third, .33, of the costs of a given consultation). (3) No informal consultations were estimated for Unit 3 due to its remote location from water management infrastructure.

## A-3. FUTURE ADMINISTRATIVE COSTS BY UNIT AND BY ACTIVITY (2007-2026),$2006

| UNIT | TYPE OF CONSULTATION | WATER MANAGEMENT | OTHER (SPECIES AND FIRE MANAGEMENT) | TOTAL NUMBER | TOTAL COSTS |
|---|---|---|---|---|---|
| Unit 1 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Unit 2 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Unit 3 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Unit 4 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Unit 5 | Formal | 1.3 | 0.1 | 1.4 | $21,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *35.7* | *$107,000* |
| Unit 6 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Unit 7 | Formal | 0.3 | 0.1 | 0.4 | $6,000 |
| | Informal | 5.7 | 0.0 | 5.7 | $43,000 |
| | Technical Assistance | 0.0 | 28.6 | 28.6 | $43,000 |
| | *Subtotal* | | | *34.7* | *$92,000* |
| Proposed Critical Habitat | Formal | 3.0 | 1.0 | 4.0 | $58,000 |
| | Informal | 40.0 | 0.0 | 40.0 | $300,000 |
| | Technical Assistance | 0.0 | 200.0 | 200.0 | $300,000 |
| | **Total** | | | **244.0** | **$658,000** |

Note: Totals may not sum due to rounding. Consultations may be undertaken for activities that span more than one unit; thus, some numbers of consultations totals show fractions (e.g., three units may show a third, .33, of the costs of a given consultation).

# APPENDIX B | SMALL ENTITY AND ENERGY IMPACTS ANALYSIS

155. This appendix considers the extent to which the results presented in the economic analysis reflect potential future impacts to small entities and the energy industry. The small business analysis is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996. The energy analysis in Section B.2 is conducted pursuant to Executive Order No. 13211.

## B.1 SBREFA ANALYSIS

156. In accordance with SBREFA, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comments a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). No regulatory flexibility analysis is required, however, if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities.

157. As detailed in Sections 3 and 4 of this analysis the economic impacts of conservation efforts for the sparrow are expected to be borne primarily by State and Federal agencies, including the Service, U.S. Army Corps of Engineers, National Park Service, South Florida Water Management District, and Florida Fish and Wildlife Conservation Commission. None of these agencies are defined as a small entities by the Small Business Administration (SBA). Consequently, the designation of critical habitat for the sparrow is not expected to impact small entities.

## B.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

158. Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies

"appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[117]

159. The Office of Management and Budget has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute "a significant adverse effect" when compared without the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[118]

160. As none of these criteria is relevant to this analysis, energy-related impacts associated with sparrow conservation efforts within the proposed critical habitat are not expected.

117 Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, http://www.whitehouse.gov/omb/memoranda/m01-27.html.

118 Ibid.

# APPENDIX C
# DETAILED UNIT BY UNIT IMPACTS

## APPENDIX C-1. DETAILED IMPACTS TO ALL ACTIVITIES

| UNIT | PAST (CONSTANT DOLLARS) | PAST PRESENT VALUE | | FUTURE (CONSTANT DOLLARS) | FUTURE PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|---|---|---|
| | | (3%) | (7%) | | (3%) | (7%) | (3%) | (7%) |
| 1: Subpopulation A Marl Prairies | $28,700,000 | $33,100,000 | $39,900,000 | $12,200,000 | $11,200,000 | $10,200,000 | $752,000 | $963,000 |
| 2: Subpopulation A Cordgrass Marshes | $2,450,000 | $2,720,000 | $3,140,000 | $2,980,000 | $2,370,000 | $1,850,000 | $159,000 | $175,000 |
| 3: Subpopulation B | $2,940,000 | $3,300,000 | $3,860,000 | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| 4: Subpopulation C | $2,450,000 | $2,720,000 | $3,140,000 | $2,830,000 | $2,220,000 | $1,700,000 | $149,000 | $161,000 |
| 5: Subpopulation D | $2,580,000 | $2,860,000 | $3,290,000 | $3,310,000 | $2,590,000 | $1,970,000 | $174,000 | $186,000 |
| 6: Subpopulation E | $2,900,000 | $3,250,000 | $3,820,000 | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| 7: Subpopulation F | $2,900,000 | $3,250,000 | $3,820,000 | $3,630,000 | $2,840,000 | $2,160,000 | $191,000 | $204,000 |
| **TOTAL** | **$44,900,000** | **$51,100,000** | **$60,900,000** | **$32,200,000** | **$26,900,000** | **$22,200,000** | **$1,810,000** | **$2,100,000** |

## APPENDIX C-2. DETAILED IMPACTS TO WATER MANAGEMENT

| UNIT | PAST (CONSTANT DOLLARS) | PAST PRESENT VALUE | | FUTURE (CONSTANT DOLLARS) | FUTURE PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|---|---|---|
| | | (3%) | (7%) | | (3%) | (7%) | (3%) | (7%) |
| 1: Subpopulation A Marl Prairies | $24,300,000 | $28,100,000 | $34,200,000 | $9,210,000 | $8,810,000 | $8,340,000 | $592,000 | $788,000 |
| 2: Subpopulation A Cordgrass Marshes | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 3: Subpopulation B | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 4: Subpopulation C | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 5: Subpopulation D | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 6: Subpopulation E | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 7: Subpopulation F | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **TOTAL** | **$24,300,000** | **$28,100,000** | **$34,200,000** | **$9,210,000** | **$8,810,000** | **$8,340,000** | **$592,000** | **$788,000** |

## APPENDIX C-3. DETAILED IMPACTS TO SPECIES MANAGEMENT

| UNIT | PAST (CONSTANT DOLLARS) | PAST PRESENT VALUE | | FUTURE (CONSTANT DOLLARS) | FUTURE PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|---|---|---|
| | | (3%) | (7%) | | (3%) | (7%) | (3%) | (7%) |
| 1: Subpopulation A Marl Prairies | $4,310,000 | $4,820,000 | $5,600,000 | $2,880,000 | $2,300,000 | $1,810,000 | $155,000 | $170,000 |
| 2: Subpopulation A Cordgrass Marshes | $2,410,000 | $2,670,000 | $3,090,000 | $2,880,000 | $2,300,000 | $1,810,000 | $155,000 | $170,000 |
| 3: Subpopulation B | $2,410,000 | $2,670,000 | $3,090,000 | $2,730,000 | $2,150,000 | $1,660,000 | $145,000 | $156,000 |
| 4: Subpopulation C | $2,410,000 | $2,670,000 | $3,090,000 | $2,730,000 | $2,150,000 | $1,660,000 | $145,000 | $156,000 |
| 5: Subpopulation D | $2,530,000 | $2,810,000 | $3,240,000 | $3,210,000 | $2,510,000 | $1,910,000 | $169,000 | $181,000 |
| 6: Subpopulation E | $2,410,000 | $2,670,000 | $3,090,000 | $2,730,000 | $2,150,000 | $1,660,000 | $145,000 | $156,000 |
| 7: Subpopulation F | $2,410,000 | $2,670,000 | $3,090,000 | $2,730,000 | $2,150,000 | $1,660,000 | $145,000 | $156,000 |
| **TOTAL** | **$18,900,000** | **$21,000,000** | **$24,300,000** | **$19,900,000** | **$15,700,000** | **$12,100,000** | **$1,060,000** | **$1,150,000** |

## APPENDIX C-4. DETAILED IMPACTS TO FIRE MANAGEMENT

| UNIT | PAST (CONSTANT DOLLARS) | PAST PRESENT VALUE | | FUTURE (CONSTANT DOLLARS) | FUTURE PRESENT VALUE | | ANNUALIZED | |
|---|---|---|---|---|---|---|---|---|
| | | (3%) | (7%) | | (3%) | (7%) | (3%) | (7%) |
| 1: Subpopulation A Marl Prairies | $40,000 | $45,000 | $52,500 | $0 | $0 | $0 | $0 | $0 |
| 2: Subpopulation A Cordgrass Marshes | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 3: Subpopulation B | $444,000 | $532,000 | $681,000 | $807,000 | $618,000 | $457,000 | $41,500 | $43,200 |
| 4: Subpopulation C | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 5: Subpopulation D | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 6: Subpopulation E | $444,000 | $532,000 | $681,000 | $807,000 | $618,000 | $457,000 | $41,500 | $43,200 |
| 7: Subpopulation F | $444,000 | $532,000 | $681,000 | $807,000 | $618,000 | $457,000 | $41,500 | $43,200 |
| **TOTAL** | **$1,370,000** | **$1,640,000** | **$2,100,000** | **$2,420,000** | **$1,850,000** | **$1,370,000** | **$125,000** | **$129,000** |