United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Jacksonville, Florida 32207-8175

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Project: Canal 111

Dear Colonel Grosskruger:

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion for the Canal-111 (C-111) Project and its potential effects on the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*) and designated Cape Sable seaside sparrow critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The Project site is located within the C-111 basin just east of Everglades National Park (ENP) in southern Miami-Dade County, Florida (Figure 1).

This Biological Opinion analyzes the potential effects of construction activities associated with the completion of the C-111 Project. Any potential effects associated with the operations of this Project will be addressed under a separate consultation in the future. The Interim Operational Plan (IOP) will be the plan in place until the final operating plan (*i.e.*, Combined Structural and Operational Plan or CSOP) can be implemented. Until then, the Service's Biological Opinion issued on November 17, 2006, regarding the IOP is in effect.

This Biological Opinion is based on information provided in the June 1, 2007, Biological Assessment (BA), the June 2007 Draft Environmental Assessment (EA), the June 2007 C-111 Engineering Documentation Report (EDR), meetings, telephone conversations, email, and other sources of information. A complete administrative record of this consultation is on file at the Service's South Florida Ecological Services Office in Vero Beach, Florida.

The Army Corps of Engineers (Corps) has determined that the proposed project will have "no effect" on the endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*) or its critical habitat, the endangered red-cockaded woodpecker (*Picoides borealis*), and the endangered Okeechobee gourd (*Cucurbita okeechobeensis* ssp. *okeechobeensis*). The Corps has also determined that the proposed project "may affect, but is not likely to adversely affect" the bald eagle (*Haliaeetus leucocephalus*), endangered Florida panther (*Puma* [=*Felis*] *concolor coryi*),

endangered West Indian manatee (*Trichechus manatus*) or its designated critical habitat, threatened American crocodile (*Crocodylus acutus*) or its critical habitat, threatened eastern indigo snake (*Drymarchon corais couperi*), endangered wood stork (*Mycteria americana*), endangered Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), and the threatened Garber's spurge (*Chamaesyce garberi*). The bald eagle is no longer a federally threatened species under the ESA (71 FR 8238). Therefore, there is no requirement under the ESA to consult on potential impacts to the bald eagle. The Corps determined that the project "will affect" approximately 480 acres of designated Cape Sable seaside sparrow critical habitat; the Service assumes this is a may affect, likely to adversely affect determination. It should be noted that the Service has submitted for public review proposed revisions (October 31, 2006; 71 FR 63980) to the critical habitat designation for sparrows that, if subsequently designated, would not include the current project area. With the exception of the Cape Sable seaside sparrow, the Service concurs with these determinations. After reviewing the Biological Assessment, the Service decided that a more detailed analysis should be conducted on the potential impacts to sparrows that may result from removal of the L-31 W canal, therefore, we chose to formally consult on this species.

The following discussion pertains to the six federally listed threatened or endangered species and their critical habitats, as appointed, for which the Corps provided an effect determination of "may affect, but not likely to adversely affect." For these species, consultation was informal.

Florida panther

The project footprint contains panther habitat of marginal quality located on the eastern edge of the primary zone in ENP. The quality of the habitat has been diminished by agricultural land use, encroachment of exotic vegetation, and its proximity to the urban boundary. No denning sites have been observed within the project footprint and the nearest recorded site was located a mile west of the proposed Northern Detention Area (NDA). The proposed action will result in temporary increases in human activity and day-time noise in the project area during construction of the project. However, the conversion of agricultural land to shallow detention area will slightly enhance the habitat value for panthers and will provide roughly 534 Habitat Units according to our analysis. Therefore, the Service concurs with the Corps' determination of "may affect, not likely to adversely affect" the Florida panther for the construction of the proposed C-111 modification. No critical habitat has been designated for the panther, therefore, none will be affected.

West Indian manatee

The endangered West Indian manatee has rarely been documented in the project area. For the entire period of record spanning over 20 years, there has been few recorded manatees within the L-31 N, C-111, and L-31 W canals. The likelihood of a manatee occurring in the project area is negligible. The Corps has agreed to implement the Comprehensive Everglades Restoration Plan manatee guidelines during construction; therefore, the Service concurs with the determination of "may affect, not likely to adversely affect" for the West Indian manatee. No designated critical

habitat for the West Indian manatee occurs in or near the project area; therefore, none will be affected.

American crocodile

The proposed construction sites do not occur within American crocodile habitat, therefore, this species would not be affected by direct construction impacts. Indirect beneficial effects may be observed in the form of increased flow and reduced salinities in northern Florida Bay. Therefore, the Service concurs with the Corps' determination of "may affect, not like to adversely affect" the American crocodile. No designated critical habitat for the American crocodile occurs in or near the project area; therefore, none will be affected.

Eastern indigo snake

Eastern indigo snakes are known to occur in the vicinity of the action area and could be adversely affected by the proposed action. However, due to the Corps' commitment to implement the standard construction measures for the eastern indigo snake, the Service concurs with the "may affect, not likely to adversely affect" determination for the construction of the proposed C-111 modification to the eastern indigo snake. No critical habitat has been designated for the eastern indigo snake, therefore, none will be affected.

Wood stork

The nearest wood stork colony to the action area is the Tamiami West colony, a distance greater than 12 miles. The foraging radius of the Tamiami West colony includes parts of WCA-3A, WCA-3B, ENP, the Pennsuco Wetlands, and adjacent urban areas. The construction of the C-111 modification will have little to no effect on the hydrologic conditions within the foraging radius of the Tamiami West colony nor will the proposed action alter water levels under the nesting substrate in the colony in such a way that would result in an artificial reversal or cause a reduction in stork foraging conditions in areas near the colony significant enough to cause colony abandonment. Therefore, the Service concurs with the Corps' determination of "may affect, not likely to adversely affect" for the construction of the proposed C-111 modification to the wood stork. No critical habitat is designated for the wood stork; therefore, none will be affected.

Garber's spurge

The Service concurs with the Corps' determination of "may affect, not likely to adversely" for the Garber's spurge because the preferred upland and coastal habitats of this species will not be impacted by construction activities.

Consultation History

*The following consultation history includes events from various projects and their operational plans (*i.e., *Experimental Program, Modified Water Deliveries (MWD), C-111, Interim Structural and Operational Plan (ISOP), and IOP) that have helped shape the evolution of the C-111*

Project over the past 13 years. In most cases, there are other documents available that the reader may wish to consult should he or she need additional details about an event listed. Events listed towards the end of the history are the most recent events pertaining directly to this consultation.

Beginning in March 1983, the National Park Service (NPS) requested restorative actions that would reduce the untimely (*i.e.*, unseasonal deliveries of water during the dry season) and spatially restrictive (*i.e.*, S-12 deliveries only) regulatory releases of water from Water Conservation Area 3A (WCA-3A) into ENP.

The Appropriations Act of 1984, Public Law 98-181 (Section 1302), which actually passed in November 1983, authorized the Secretary of the Army to conduct an Experimental Program of water deliveries to ENP. This allowed the Corps the authority to initiate a series of iterative field tests, with the South Florida Water Management District (District) and ENP concurrence, to collect and analyze hydrological and ecological data.

The Appropriations Act of 1984 authorized the Corps to implement the Experimental Program to ENP.

In 1989, the ENP Protection and Expansion Act incorporated northeast Shark River Slough (area east of the L-67 Extension) preservation under the protection of the NPS.

In 1990, the Corps issued a draft General Design Memorandum (GDM) on the MWD to ENP Project.

In February 1990, the Service issued a jeopardy Biological Opinion for the MWD to ENP Project with a reasonable and prudent alternative (RPA) to preclude jeopardy for the Everglade snail kite and concluded non-jeopardy for the wood stork (*Mycteria americana*).

In 1992, the Corps finalized the GDM on the MWD to ENP Project.

In 1993, the Corps implemented Test Iteration 6 of the Experimental Program to ENP.

In May 1994, the Corps issued a Final Integrated General Reevaluation Report (GRR) and Environmental Impact Statement (EIS) on the C-111 Project.

In May 1994, the Service concurred with the Corps' determination of "no effect" on the C-111 Project for the Everglade snail kite, wood stork, bald eagle, eastern indigo snake, American crocodile, and Florida panther. However, the Service was unable to evaluate the effects on the Cape Sable seaside sparrow beyond construction features and, therefore, could not concur with a "no effect" determination until specific operational criterion was developed.

On June 3, 1994, (mistakenly dated 1993) the Service issued a non-jeopardy Biological Opinion on Test Iteration 6 of the Experimental Program to ENP for Cape Sable seaside sparrows.

In 1995, the Corps extended the duration of Test Iteration 6 of the Experimental Program to ENP.

By letter dated September 22, 1995, the Service concluded that Test Iteration 7 of the Experimental Program to ENP was not likely to adversely affect the Florida panther, American crocodile, Everglade snail kite, and eastern indigo snake, but that implementation of Test Iteration 7 was likely to adversely affect the Cape Sable seaside sparrow and its designated critical habitat, and the wood stork.

On October 27, 1995, the Service issued a jeopardy Biological Opinion on Test Iteration 7 - Phase 1 of the Experimental Program to ENP for Cape Sable seaside sparrows with a RPA to preclude jeopardy and concluded non-jeopardy for the wood stork.

In 1995, the Corps implemented Test Iteration 7 - Phase 1 of the Experimental Program to ENP.

In 1995, the Corps initiated a hydrologic and ecological monitoring program for Test Iteration 7 of the Experimental Program to ENP.

On October 17, 1997, the Service requested that the Corps reinitiate consultation on the MWD to ENP Project, the Experimental Program to ENP, and the C-111 Project due to the interdependence and interrelatedness of the projects.

By letter dated November 4, 1997, the Corps agreed to reinitiate consultation on the MWD to ENP Project and the Experimental Program to ENP, but recommended consultation be deferred on the C-111 Project since specific operational criterion were still under development.

In 1998, the Corps implemented an emergency deviation from Test Iteration 7 – Phase 1 of the Experimental Program to ENP for the explicit purpose of protecting listed species in the action area.

On February 19, 1999, the Service issued a jeopardy/adverse modification Biological Opinion on the MWD to ENP Project, the Experimental Program to ENP, and the C-111 Project for Cape Sable seaside sparrows, non-jeopardy for the wood stork and Everglade snail kite, and no destruction or adverse modification of Everglade snail kite critical habitat. This consultation evaluated the effects of construction features only, given that specific operational criterion had not been developed for the three interrelated/interdependent projects.

In 1999, the Corps implemented an emergency deviation from Test Iteration 7 – Phase 1 of the Experimental Program to ENP for the explicit purpose of protecting listed species in the action area.

Between February 1999 and December 1999, numerous interagency meetings and conference calls were held between the Corps, Service, ENP, and District to discuss implementation of the Service's 1999 Biological Opinion's RPA.

In December 1999, interagency meetings were elevated to The White House Council on Environmental Quality (CEQ) to obtain guidance on National Environmental Policy Act (Public Law 91-190, 42 U.S.C. 4321-4347, as amended) (NEPA) coverage for emergency operations and to facilitate negotiations on points of disagreement between the Department of the Interior (DOI) and the Corps. These interagency meetings resulted in the development of the Interim Structural and Operational Plan (ISOP), Emergency Deviation from Test Iteration 7 of the Experimental Program to ENP for protection of the Cape Sable seaside sparrow.

In 2000, the Corps implemented the ISOP 2000 emergency deviation.

In April 2000, the Service participated in interagency discussions on ISOP 2000 implementation. The Service made several recommendations in a planning aid letter to the Corps in an attempt to solve the problems that were resulting in the ISOP not meeting RPA targets in subpopulations E and F. Further interagency discussions led to modifications of the ISOP 2000, resulting in ISOP 2001.

In October 2000, the Corps issued a draft Test Iteration 7 (years 1 through 4) hydrologic monitoring report.

In December 2000, the Corps issued a Supplemental Environmental Impact Statement (SEIS) and Record of Decision (ROD) for the 8.5 Square Mile Area Project (SMA) portion of the MWD to ENP Project.

In 2001, the Corps implemented the ISOP 2001 emergency deviation.

In February 2001, at the suggestion of CEQ, the Corps, Service, ENP, and District hired the U.S. Institute for Environmental Conflict Resolution (USIECR) to facilitate and mediate the development of an improved hydrologic management plan.

In August 2001, because of the process provided by the USIECR, a collaborative agreement between the Corps, Service, ENP, and District was reached on a new alternative, the IOP.

In 2001, the Corps issued a draft EIS for the IOP.

In September 2001, the Corps issued a draft SEIS for the IOP.

In December 2001, the District withdrew its support for the IOP, citing flood control concerns. The Corps, District, ENP, and the Service continued to refine this alternative to satisfy the District's concerns.

In February 2002, the final recommended plan for the IOP was discussed with DOI at a meeting among the Corps, DOI, and the District.

On March 15, 2002, the Corps provided a determination that the IOP is "not likely to adversely affect" Cape Sable seaside sparrows, wood storks, and eastern indigo snakes, but "adverse

effects" would occur to Everglade snail kites because of higher water levels in WCA-3A. Additionally, adverse effects would occur to Florida panthers due to the loss of habitat through the construction of a proposed 500 cubic-feet per second (cfs) pump station (S-332C) and three seepage reservoirs associated with S-332B, C, and D Pump Stations. The Corps' determination concerning Florida panthers noted that the overall ecological improvements to panthers elsewhere in the project area would likely counterbalance the habitat lost in the footprint of the proposed reservoirs. Finally, the Corps requested that the Service amend the February 19, 1999, Biological Opinion to consider the IOP as a second RPA to address jeopardy to Cape Sable seaside sparrows.

On March 28, 2002, the Service amended the 1999 Biological Opinion to include the IOP as a second RPA. The amendment clarified that IOP Alternative 7R represents an additional RPA for water-management actions to avoid jeopardy to the Cape Sable seaside sparrow and would not destroy or adversely modify designated critical habitat. Specifically, IOP Alternative 7R must be implemented in combination with all other RPA components contained in the February 19, 1999, Biological Opinion with the exception of component number 6, requiring the completion and operation of MWD by 2003. The conclusion of the 1999 consultation would still govern and formal consultation was therefore terminated for these particular species, under 50 CFR §402.14(l)(1) *Termination of Consultation*.

The Service also concurred with the Corps' determination that the IOP would "adversely affect" Everglade snail kites and its designated critical habitat in WCA-3A. The Service determined that the IOP is not likely to jeopardize the continued existence of Everglade snail kites or result in the destruction or adverse modification of its designated critical habitat. The Service concurred that the IOP is not likely to adversely affect Florida panthers.

On July 3, 2002, the Corps signed a ROD for the IOP.

On January 25, 2006, the Corps signed the ROD to bridge Tamiami Trail (US Highway 41), a component of MWD to ENP Project.

On May 5, 2006, the Corps published a Notice of Intent to prepare a SEIS.

On May 10, 2006, the Corps issued a letter initiating the preparation of a supplement to the 2002 Final EIS on the IOP following a March 2006 U.S. District Court order from the Southern District of Florida.

On June 23, 2006, the Service received the Corps' June 22, 2006, draft SEIS for protection of the Cape Sable seaside sparrow.

On July 7, 2006, the Corps issued a letter to the Service requesting reinitiation of consultation concerning the IOP Alternative 7R. This letter provided the Service the BA on listed species in the project area necessary to initiate the formal consultation process under the Act for the IOP Project.

On November 13, 2006, the Corps and the Service agreed via a conference call that proposed Cape Sable seaside sparrow critical habitat (October 31, 2006; 71 FR 63980) would not be adversely modified or destroyed by the proposed continuation of IOP.

On November 17, 2006, the Service issued a Biological Opinion on the proposed continuation of IOP. It was concluded that continuation of the IOP as proposed would not likely jeopardize the continued existence of the Cape Sable seaside sparrow, Everglade snail kite, or wood stork and is not likely to destroy or adversely modify designated critical habitat for the Cape Sable seaside sparrow or Everglade snail kite. This BO described slightly modified ways to calculate incidental take for sparrows based on new information about sparrow ecology and improved sparrow monitoring that has occurred since 1999.

On May 11, 2007, the Corps forwarded a Draft BA for the C-111 GRR Modifications and requested comments and agreement on the threatened and endangered species list within the project area.

On May 17, 2007, the Service forwarded comments on the Draft BA to the Corps.

On June 25, 2007, the Corps issued a letter to the Service requesting review and comments on the EDR and Draft EA, including a BA, for Design Modifications for the C-111 Project, Miami-Dade County, Florida. The purpose of these documents is to support the Corps' finding of no significant impact to the quality of the human environment and to certify that the proposed actions will not require an Environmental Impact Statement (EIS). Through these documents it was evident that the proposed actions would affect 480 acres of designated Cape Sable seaside sparrow habitat thus perpetuating the need for this Biological Opinion.

On July 23, 2007, members of the Service, Corps, and District met to discuss the incidental take statement and other issues associated with Service's Biological Opinion dated November 17, 2006.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The proposed action is the construction of the final structural elements needed for the complete "build-out" of the C-111 Project. The project was originally described and authorized in the Corps' 1994 *Final General Re-evaluation Report and Environmental Impact Statement* (GRR/EIS), Canal 111, South Dade County, Florida. The primary purposes of the Project are to restore hydrological conditions in Taylor Slough and the eastern panhandle of ENP, eliminate damaging freshwater flows to Manatee Bay and Barnes Sound in Biscayne National Park, and maintain flood protection within the C-111 basin (Figure 2).

Since the completion of the C-111 GRR/EIS in 1994, several components of the project have been built as emergency actions taken to protect the Cape Sable seaside sparrow (Figure 3). These components are documented in the Corps' Final EA on ISOP (2000) and Final EIS on IOP (2002) and include the S-332B west detention area and associated pump station, S-332C

detention area and associated pump station, S-332D detention area and associated pump station, S-332B north detention area, and the partial B-C connector. The complete B-C connector was discussed in the 2006 IOP Final EIS (Corps 2006) and is scheduled for completion in 2007.

The remaining features of the original plan have been analyzed and adjusted via the Project Development Team (PDT) process for the CSOP. Until recently, the remaining features of the C-111 Project were to be designed and built as part of CSOP; however, the Corps decided that it was not feasible to wait for the completion of CSOP when the C-111 features were already authorized and could be constructed quickly. The CSOP PDT evaluated five alternative plans, considering the authorized objectives of the C-111 Project and MWD to ENP Project. Each of the alternative plans included structural design refinements to the 1994 C-111 GRR/2002 IOP, which remained constant across all five plans. For a complete list of alternatives, please refer to the Corps' 2007 EA.

Alternative Number 1 was selected by the Corps as the preferred alternative. It includes modifications to C-111 Project features that have been contemplated in a number of forums since completion of the 1994 GRR/EIS (*e.g.*, ISOP, IOP and CSOP). Alternative Number 1 has been selected based on its ability to satisfy the project purpose to the greatest degree while providing flexibility in reducing other potential impacts to the human environment. Evaluations performed for CSOP are referenced to support the EDR's recommended structural design refinements. These evaluations include (1) a comparison of habitat units provided by the CSOP Tentatively Selected Plan (TSP) and the "No Action" planning conditions, and (2) level of service for flood damage reduction provided by the CSOP TSP compared to the 1994 C-111 GRR planning condition. The purpose of the second analysis is to ensure the authorized level of service of flood damage reduction in the C-111 basin is maintained. It should be noted that this project will not provide all of the benefits produced by the CSOP TSP, but it is reasonable to believe the project will provide significant environmental benefits. For additional information on the evaluation of CSOP alternative plans, please see the draft CSOP GRR.

The proposed actions (Figure 4) for the completion of the C-111 Project in the preferred alternative are described below. For a more detailed description of each component please refer to the Corps' 2007 EA and EDR.

1. Expansion of the NDA.

   The proposed action will create an expanded NDA between the existing S-332B north detention area and the 8.5 Square Mile Area Stormwater Treatment Area (8.5 SMA STA), which is a component of the MWD to ENP Project. The proposed new C-111 NDA will be created by extending the L-31W tieback levee to the north to tie into the 8.5 SMA STA and realigning the S-332D tieback levee to also tie into the 8.5 SMA STA. Both of these levees are discussed in more detail below.

   This modification will increase the size of the NDA to approximately 1,441 acres and cover former agricultural lands now owned by the District, the non-Federal sponsor for the C-111 Project. The interior of the detention area will be scraped to the underlying rock layer to

provide material to construct the L-31W and S-332D tieback levees. Two pump stations will supply water to the area, the S-357 from the 8.5 SMA in the north and the S-332B in the south. The NDA will be divided into three areas: (1) a flow way area (232 acres), (2) a main detention area (1,180 acres), and (3) an additional storage area in the southern part of the NDA (29 acres).

2. Extension of L-31 West Tieback Levee North to the 8.5 SMA STA.

The 1994 C-111 GRR called for a new north-south levee to be constructed roughly parallel to the existing L-31N levee, beginning at L-31W near S-175 and extending northward approximately 9.25 miles to higher ground in the Rocky Glades area in the vicinity of S-332B, to form the western containment levee of the retention/south detention area (SDA). Based on the 2000 8.5 SMA Report, the goal now is to extend the retention/detention area (hydraulic ridge) north to the 8.5 SMA, tying the tieback levee into the 8.5 SMA perimeter levee at Richmond Drive. This modification increases the length of the levee by 6.75 miles, of which approximately 2 miles was constructed under IOP. To increase the storage capacity of the retention/detention area, the levee heights were increased 2 to 3 feet to make the retention/detention areas surrounded by 6-foot levees. The western toe of the levee will be constructed so that it is offset from the ENP eastern boundary by 150 feet.

Material for the construction of the levee will be obtained from the scraping of former agricultural land within the detention area. If additional material is needed, then additional lands would be scraped within the buffer area between the retention/detention area and the L-31N borrow canal.

3. S-332D Tieback Levee.

A slight refinement to the alignment of the S-332 tieback levee presented in the 1994 C-111 GRR is being proposed to increase the storage capacity of the retention/detention areas. The levee heights will be increased 2 to 3 feet to make the retention/detention areas surrounded by 6-foot levees. The northern terminus of the levee would be realigned to tie into the southeast corner of the 8.5 SMA STA.

The S-332D tieback levee starts in the Frog Pond approximately one half mile east of L-31N and proceeds north approximately 45,800 feet to tie into the 8.5 SMA STA. In conjunction with the L-31W tieback levee, this portion of the levee forms the eastern containment levee for the hydraulic ridge/detention area that extends from the Frog Pond north to the 8.5 SMA.

4. NDA Southern Divide Berm.

The NDA Southern Divide Berm is a proposed new feature that will be constructed in the southeastern part of the existing S-332B NDA. The purpose of this 3-foot high berm is to offset the lower portion of the proposed C-111 NDA farther away from the L-31N borrow

canal. This will reduce the seepage losses from the area by increasing the seepage length. Once stages exceed 2.75 feet above average ground within the area, two overflow weirs built into the berm section would begin to utilize this part of the detention system. The berm would have a 12-foot top width with 1:4 (V:H) side slopes and a crest elevation approximately 3 feet above grade. The total length of the berm would be approximately 3,250 feet.

5. C-111 NDA Southern Divide Berm Weirs.

   Two concrete overflow weirs are proposed to be constructed within the proposed NDA Southern Divide Berm and are designed to start passing water into this portion of the detention area when stages exceed 2.75 feet above average ground surface elevation. The weirs will allow for water to equalize across the berm between the two areas so that scour problems do not occur. The weirs will be 100 feet long with a crest elevation set at 2.75 feet above grade with a 12-foot top width and side slopes of 1:3 (V:H).

6. Overflow weirs to the west through the L-31W Tieback Levee.

   The 1994 C-111 GRR planned to construct twenty-four 36-inch diameter culvert/risers and one 300-foot long emergency overflow weir through the L-31W tieback levee to convey water from the retention/detention area westward towards ENP. Each feature was designed to pass 50 percent of the maximum pump capacity of the three pump stations S-332B, S-332C, and S-332D with 0.5 feet of head difference. A revised recommendation eliminates the culverts and constructs four overflow weirs in the L-31W tieback levee. Two weirs would be constructed in each detention area.

7. S-332B 500-foot Flow way.

   The 1994 C-111 GRR proposed the construction of a 0.5-mile long concrete-lined canal from the S-332B pump station to the retention/detention area just west of the S-332D tieback levee. The canals were to be constructed of concrete to minimize return seepage to L-31N. With increased capacity at the S-332B pump station, it will be more economical to construct a 500-foot wide flow way (23.6 acres) and allow a minimum amount of return seepage to the L-31N borrow canal. Typically, the current detention areas (S-332B West, S-332B North, and S-332C) seep approximately 0.1 to 0.3 cfs per acre during wet and dry periods, respectively. The purpose of the flow way would be to convey water from the L-31N canal to the NDA and SDA.

8. S-332C 500-foot Flow way.

   The 1994 C-111 GRR proposed the construction of a 0.5-mile long concrete lined canal from the S-332C pump station to the retention/detention area just west of the S-332D tieback levee. The canals were to be constructed of concrete to minimize return seepage to L-31N. With increased capacity at the S-332C pump station, it will be more economical to construct a 500-foot wide flow way (23.6 acres) and to allow a minimum amount of return

seepage to the L-31N borrow canal. Typically, the current detention areas (S-332B West, S-332B North, and S-332C) seep approximately 0.1 to 0.3 cfs per acre during wet and dry periods, respectively. The purpose of the flow way would be to convey water from the L-31N canal to the retention/detention areas.

9. 500-foot Flow way System.

A 500-foot wide flow way system will be constructed within the C-111 NDA (20,000 linear feet) and the C-111 SDA (25,500 linear feet) parallel to the S-332D tieback levee. The flow way will be contained by the S-332D tieback levee on the east and a 1.5-foot high concrete berm located 500 feet west of the tieback levee. The flow way will hold the first 1.5 feet of water before overflow will be allowed west into the rest of the detention area. This feature will maintain a hydraulic ridge along the entire length of the C-111 buffer system during periods of low flow and transitions between the dry and wet seasons. In addition to the flow way reducing seepage losses from ENP and C-111 buffer during these periods, it will add operational flexibility which can be used to further attenuate flood control affects of the L-31 N and C-111 canals on the hydrology of ENP wetlands.

10. L-31W Borrow Canal backfilling.

The original 1994 C-111 GRR plan proposed that the L-31W borrow canal be filled from the S-332 pump station north to where the L-31W levee ties into the L-31W tieback levee, a distance of approximately 25,000 feet. The new plan proposes to backfill the L-31W borrow canal for a distance of 30,000 feet and partially backfill for an additional 19,300 feet.

The original plan proposed degrading the L-31W levee and using that material to back fill the borrow canal. However, this levee is now required for the Frog Pond Detention Area (constructed in 2002) and will not be degraded. Fill will now be taken from the material stockpiled during the degrading of the C-111 spoil mound, which is located within the Frog Pond area. Backfilling the L-31W borrow canal will prevent the canal from acting as a "sump" and pulling water out of ENP.

11. Aerojet Canal Plugs.

Canal plugs are proposed to be constructed in the existing Aerojet Canals to reduce the southward flow of water during dry conditions, thereby improving the nearby hydroperiods of the Southern Glades and reducing the unnaturally large flow lost from Taylor Slough. These plugs will greatly reduce the surface water conveyance capacity when the water level reaches ground surface and slightly reduce the surface water conveyance as the plugs will stop flow through the canal, but not prevent flow around the plugs, through the marsh, and subsequently back into the canal.

Four canal plugs would be placed in the canal, two in the north-south canal and two in the east-west canal. These plugs would have a 100-foot top width, 1:5 (V:H) side slopes, and

backfilled to 1-foot above the surrounding grade. Material would be obtained from the C-111 Spoil Mound stock pile within the Frog Pond area. Also, at the confluence of the two canals, there are earthen canal crossings. Until field investigations are conducted, it is assumed that culverts exist in these crossings and will need to be plugged.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project (Figure 4) includes the lower L-31 canal from the 8.5 SMA south along the C-111 South Dade Conveyance System (SDCS) to the Aerojet complex, including the Frog Pond area and all adjacent lands that may be affected by changes in hydrology caused by the proposed actions. This area also includes those lands and waters supporting populations of threatened and endangered species, and their designated critical habitats, likely to be directly or indirectly affected by the proposed action.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/Critical Habitat Description

Cape Sable Seaside Sparrow Critical Habitat

Critical habitat for the Cape Sable seaside sparrow was designated on August 11, 1977 (42 FR 47840). Currently, the critical habitat designation includes areas of land, water, and airspace in the Taylor Slough vicinity of Collier, Miami-Dade, and Monroe counties. Much of this area is within the boundaries of ENP. Because this was one of the first critical habitat designations under the Act, there were no primary constituent elements defined. The designated area encompasses about 197,260 acres and includes portions of Subpopulations B through F. Subpopulation A is the only area occupied by sparrows that does not have associated designated critical habitat.

Because the majority of designated critical habitat lies within ENP, there have been relatively few impacts. However, about 471.5 acres of critical habitat were altered during construction of the S-332B Detention Area and a portion of the B-C Connector. No other permanent alteration of critical habitat is known. Degradation of critical habitat has resulted from flooding within the area of Subpopulation D and from frequent fires and woody vegetation encroachment in overdrained areas near sparrow Subpopulations C and F. Degradation of these habitats is not permanent, and they may improve through restoration efforts. The current critical habitat designation includes many areas of habitat that are not suitable for sparrows, including the pinelands and abandoned agricultural areas. The 471.5 acres of impacts to critical habitat occurred within abandoned agricultural areas that did not closely resemble suitable sparrow habitat.

On October 31, 2006, the Service proposed revisions to designated critical habitat for the Cape Sable seaside sparrow (71 FR 63980). If implemented, the proposed revisions would reduce the total acreage of critical habitat from 197,260 acres to approximately 156,350 acres. The Service

proposes to designate seven units as critical habitat for the sparrow in southern Florida, which includes critical habitat for Subpopulation A that previously was not designated. On November 13, 2006, the Corps and the Service agreed via teleconference that the revised critical habitat proposed for the sparrow would not be adversely modified or destroyed by the continuation of IOP. Figure 1 shows current and proposed critical habitat near the major project features. However, no project features occur within proposed critical habitat, only designated critical habitat.

Cape Sable Seaside Sparrow

The Cape Sable seaside sparrow is one of eight extant subspecies of seaside sparrow in North America. Its distribution is limited to the short-hydroperiod wetlands at the bottom of the greater Everglades system on the southern tip of mainland Florida. The Cape Sable seaside sparrow was first provided protection when it was listed on March 11, 1967, under the Endangered Species Preservation Act of 1967 (32 FR 4001). Protection for the sparrow was continued under the Endangered Species Conservation Act of 1969 and the Act of 1973. The sparrow and all other species listed under the Endangered Species Conservation Act were the first species protected under the Act of 1973, as amended, and all of these species were given the 'endangered' designation.

Species Description

The Cape Sable seaside sparrow is a medium-sized sparrow, 5.1 to 5.5 inches in length (Werner 1975). Of all the seaside sparrows, it is the lightest in color (Curnutt 1996). The dorsal surface is dark olive-grey, and the tail and wings are olive-brown (Werner 1975). Adult sparrows are light grey to white ventrally, with dark olive-grey streaks on the breast and sides. The throat is white with a dark olive-grey or black whisker on each side. Above the whisker is a white line along the lower jaw. A grey ear patch outlined by a dark line sits behind each eye. The lores of the head are yellow. The leading edge of each wing has a small yellow patch near the alula. The legs and bill are grey (Curnutt 1996). There are no significant differences in markings between the sexes. However, there are noticeable differences in the sizes of specific body parts between the sexes (Werner 1975), but these differences are not consistent enough to conclusively determine gender. Gender can be determined in adult sparrows during the breeding season by the presence of a brood patch (female) or a cloacal protuberance (male). The plumage of young sparrows differ from adults in that they do not have whisker marks, lack the yellow lores, and have brown streaking on the chest and an overall more brownish plumage coloration.

Life History

Unlike most other subspecies of seaside sparrow, which occupy primarily brackish tidal systems (Post and Greenlaw 1994), the Cape Sable seaside sparrow currently occurs primarily in the short-hydroperiod wet prairies, also referred to as marl prairies, though it still occupies brackish marshes in some areas. The extinct dusky seaside sparrow (*A. m. nigrescens*) was the only other subspecies that persisted in freshwater wetlands (Post and Greenlaw 1994; Pimm et al. 2002).

The Cape Sable seaside sparrow is generally sedentary, secretive, and non-migratory, occupying the marl prairies of southern Florida year-round. During the breeding season (March to August), male sparrows establish and defend territories that are variable in size, ranging from 0.7 to 16.8 acres (Werner 1975), with reported average sizes ranging from 2.2 to 8.9 acres within different sites and years (Werner and Woolfenden 1983, Pimm et al. 2002).

Sparrows are thought to be generally monogamous (Post and Greenlaw 1994), with a single female occurring within a male's breeding territory. However, recent information indicates that sparrows may be polygamous under some circumstances, such as within small populations, and it is unknown whether the birds are simultaneously or sequentially polygamous (Lockwood et al. 2006). Throughout the breeding season, the majority of a sparrow pair's activities occur within thei territory, including breeding, feeding, and sheltering. Within an area of suitable habitat, territories do not appear to be tightly packed (Werner 1975), and there are gaps between defended boundaries of adjacent males. It is likely that sparrows venture into these "unclaimed areas" during the breeding season.

Sparrows generally begin nesting in early March (Lockwood et al. 2001), but may begin territorial behavior, courtship, and nest-building in late February (Werner and Woolfenden 1983, Lockwood et al. 1997). This timing coincides with the dry season, and most areas within the marl prairies are either dry or barely inundated at the beginning of the breeding season. During the dry portion of the breeding season (March to May), sparrows build nests in vegetation 6.7 to 7.1 inches above the ground (Werner 1975; Lockwood et al. 2001). Nests are woven into clumps of dense vegetation and are well-concealed (Werner 1975, Post and Greenlaw 1994). Nest cups are consistently concealed from above (Post and Greenlaw 1994), either through construction of a domed cover or through modifying vegetation in the vicinity (Werner 1975, Post and Greenlaw 1994). During the wet portion of the sparrow breeding season (June to August), sparrows build their nests higher in the vegetation than during dry periods, an average of 8.3 inches above the ground (Lockwood et al. 2001). Wet season nests probably occur in taller vegetation than during the dry season because, even at the nest height, there must be sufficient height and density of vegetation to cover and conceal nests.

Pimm et al. (2002) suggest that nesting will not be initiated if water depths are greater than 4 inches during the breeding season. For many years, rising water levels resulting from the onset of summer rains were thought to end the breeding season (Werner 1975). While these statements are true, the sparrows may respond to changes in hydrologic conditions as long as water levels are not prohibitively high. Large rainfall events early in the wet season may cause some nest failure and sparrows generally cease breeding when water levels rise above the mean height of the nests from the ground (Lockwood et al. 1997). However, if water levels subsequently drop, sparrows may again initiate breeding activity. The initiation of molt, which usually occurs in early September, is probably the best indicator of the true end of breeding season.

The sparrow nesting cycle, from nest construction to independence of young, lasts about 30 to 50 days (Werner 1975, Lockwood et al. 2001), and sparrows may renest following both successful and failed nesting attempts (Werner 1975, Post and Greenlaw 1994, Lockwood et al. 2001). Both parents rear and feed the young birds and may do so for an additional 10 to 20 days

after the young fledge (Woolfenden 1956, 1968; Trost 1968). The young are incapable of flight until they are about 17 days of age. During the period when fledglings cannot fly they will freeze on a perch when approached, and once the threat is within 3 feet they will then run along the ground to escape (Werner 1975, Lockwood et al. 1997).

Because of the long breeding season in southern Florida, sparrows regularly nest several times within a year and may be capable of successfully fledging 2 to 4 clutches, though few sparrows probably reach this level of success (Lockwood et al. 2001). Second and third nesting attempts may occur during the early portion of the wet season, and nests later in the season usually occur over water.

Nest success rates vary among years and range from 12 to 53 percent (Lockwood et al. 2001). Nest predation, the primary cause of nest failure (Pimm et al. 2002), accounts for more than 75 percent of all nest failures (Lockwood et al. 1997). As water levels begin to rise above ground surface with the onset of the summer rains in May to June, nest predation rates also rise. Nests that are active after June 1, when water levels are above ground, are more than twice as likely to fail as nests during drier periods (Lockwood et al. 2001). This effect appears to be a result of both increased likelihood of nests being flooded and an increased likelihood of predation (Lockwood et al. 1997, 2001; Pimm et al. 2002).

Outside of the breeding season, sparrows generally remain sedentary in the general vicinity of their breeding territories, but expand the area that they use compared to the breeding season territory (Dean and Morrison 2001). Average non-breeding season home range size was about 42.1 acres in size and ranged from 14.1 to 137.1 acres (Dean and Morrison 2001). Some individuals make exploratory movements away from their territories and may occasionally relocate their territories and home ranges before resuming a sedentary movement pattern (Dean and Morrison 2001).

Sparrows are generally short-lived, with an average lifespan of probably 2-3 years and an average individual annual survival rate of 66 percent (Lockwood et al. 2001). Consequently, a sparrow population requires favorable breeding conditions in most years to be self-sustaining, and cannot persist under poor conditions for extended periods (Lockwood et al. 1997, 2001; Pimm et al. 2002).

While detailed information about the diet of sparrows is not known, invertebrates comprise the majority of their diet, though sparrows may also consume seeds when they are available (Werner 1975, Post and Greenlaw 1994). Howell (1932) identified the contents of 15 sparrow stomachs and found remains of primarily insects and spiders, as well as amphipods, mollusks, and plant matter. Primary prey items that are fed to nestlings during the breeding season include grasshoppers (Orthoptera), moths and butterflies (Lepidoptera), dragonflies (Odonata), and other common large insects (Post and Greenlaw 1994, Lockwood et al. 1997). Adult sparrows probably consume mainly the same species during the nesting season. Sparrows may consume different proportions of different species over time and among sites, suggesting that they are dietary generalists (Pimm et al. 2002). During the non-breeding season, preliminary information from evaluation of fecal collections suggests that a variety of small invertebrates, including

weevils and small mollusks are regularly consumed (Dean and Morrison 2001). Evidence of seed consumption was only present in four percent of samples (Dean and Morrison 2001). These non-breeding season samples may not be representative of the foods most frequently consumed during that season and may only represent a portion of the items ingested.

While the sparrow appears to be a dietary generalist, an important characteristic of sparrow habitat is its ability to support a diverse array of insect fauna. In addition, these food items must be available to sparrows both during periods when there is dry ground and during extended periods of inundation. The specific foraging substrates used are unknown, but they probably vary throughout the year in response to hydrologic conditions.

Sparrow subpopulations require patches of contiguous open habitat 4,000 acres or larger. The minimum area required to support a population has not been specifically determined, but the smallest area that has remained occupied by Cape Sable seaside sparrows for an extended period is this size. Individual sparrows are area-sensitive and generally avoid the edges where other habitat types meet the marl prairies. They will only occupy patches less than 100 acres of marl prairie vegetation when they occur within large, expansive areas and are not close to forested boundaries (Dean and Morrison 2001). Once sparrows establish a breeding territory, they exhibit high site fidelity, and each individual sparrow may only occupy a small area for the majority of its life. Because sparrows are generally sedentary and avoid forested areas, they are not likely to travel great distances to find mates or to find outlying patches of suitable habitat. The occurrence of sparrows over time within each of the subpopulations shows a centrality, in which sparrows most consistently occur and are most abundant near the center of the patch of habitat in which they occur.

Within a patch of occupied suitable habitat, sparrow breeding territories do not generally saturate the entire area. Even when sparrows occur at high densities, small areas usually remain between adjacent territories, though some territories also appear to overlap. In addition, some gaps remain unclaimed by territorial birds that may appear to be suitable habitat (Werner 1975). In many cases, areas that appear to be suitable for sparrow occupancy may not be suitable during certain environmental conditions and this may cause sparrow territories to appear to be widely separated from neighboring territories.

Cape Sable seaside sparrows have been associated with two vegetative communities: (1) the cordgrass marshes that are tidally-influenced and occur within a narrow band of the coast just landward from the mangrove communities, and (2) the short-hydroperiod marl prairies of the southern Everglades that flank the deeper freshwater sloughs.

The tidally-influenced cordgrass marshes constitute typical seaside sparrow habitat and closely resemble areas occupied by other seaside sparrow subspecies (Post and Greenlaw 1994). Occurrence year-round within the freshwater marl prairies is relatively unique among seaside sparrows, with only the extinct dusky seaside sparrow exhibiting a similar habitat affinity. In the freshwater areas previously occupied by the dusky seaside sparrow, the habitat was still primarily composed of cordgrass (Post and Greenlaw 1984).

The freshwater habitats occupied by the Cape Sable seaside sparrow are not dominated by cordgrass, but the most commonly associated plant species is muhly grass (*Muhlenbergia filipes*) (Werner 1975, Kushlan and Bass 1983, Werner and Woolfenden 1983, Post and Greenlaw 1994). However, a variety of vegetation species occurs within the freshwater marl prairies occupied by sparrows, including vegetation from which *Muhlenbergia* is absent (Ross et al. 2006). Other dominant species that occur in these prairies include sawgrass (*Cladium jamaicense*), (*Schizachyrium rhizomatum*), black-topped sedge (*Schoenus nigricans*), and beak rushes (*Rhynchospora* spp.) (Werner and Woolfenden 1983, Ross et al. 2006).

Sparrows occupy these communities year-round, and the vegetation must support all sparrow life stages. During periods when the communities are dry, usually coinciding with the late winter and early spring (December to May), sparrows travel across the ground surface beneath the grasses and only occasionally perch within the vegetation. During the wet season (June to November), these areas are continually inundated, with peak water depths occasionally exceeding 2 feet (Nott et al. 1998). During these periods, sparrows travel within the grass, perching low in the clumps, hopping among the bases of dense grass clumps, and walking over matted grass litter. They fly more frequently and regularly perch low in the vegetation, but generally remain inconspicuous (Dean and Morrison 2001).

Small tree islands and individual trees and shrubs occur throughout the areas occupied by the sparrows, but at a very low density. Sparrows do not appear to require woody vegetation during any aspect of their normal behavior and generally avoid areas where shrubs and trees are either dense or evenly distributed. However, the small tree islands and scattered shrubs and trees may serve as refugia during extreme environmental conditions and may be used as escape cover when fleeing from potential predators (Dean and Morrison 2001). Because of their general aversion to dense trees and woody vegetation, encroaching trees and shrubs can quickly degrade potential habitat.

Hydrologic conditions have significant effects on sparrows both directly and indirectly. First, depth of inundation within sparrow habitat is directly related to the sparrow's ability to move, forage, nest, and find shelter and cover from predators and harsh environmental conditions.

Average annual rainfall in the Everglades is about 56 inches per year (ENP 2005) with the majority of this falling during the summer months, which coincides with the latter half of the sparrow nesting season. This rainfall has a strong influence on the hydrologic characteristics of the marl prairies. However, throughout southern Florida, including sparrow habitat, hydrologic conditions are influenced by water management actions. The operation of a system of canals, levees, pumps, and other water management structures can have profound impacts on the hydrologic conditions throughout much of the remaining marl prairies (Johnson et al. 1988, Van Lent and Johnson 1993, Pimm et al. 2002).

At water levels over 2 feet above ground surface, the majority of the vegetation in sparrow habitat is completely inundated, leaving sparrows with few refugia. Conditions such as these may result in significant impacts to sparrow survival and, if they occur during the breeding season, these water levels can cause flooding and loss of sparrow nests (Nott et al. 1998, Pimm

and Bass 2002). Even 6 inches of water may sufficiently inundate some habitat such that sparrows are incapable of finding shelter and moving around within limited areas. These water levels, when they occur during sparrow nesting season, result in increased rates of nest failure due to depredation (Lockwood et al. 1997). While there is relatively little elevation variation within the Everglades, differences in elevation as small as 1 foot can result in very different habitat characteristics.

The vegetative species composition and density in the Everglades are largely influenced by hydroperiods. Hydroperiods that range from 60 to 270 days support the full variety of vegetative conditions that are generally suitable for sparrows (Ross et al. 2006), though the vegetative composition and structure may vary significantly. Persistent increases in hydroperiod may quickly result in changes in vegetative communities from marl prairies or mixed prairies to sawgrass-dominated communities resembling sawgrass marshes (Nott et al. 1998). Average hydroperiods that extend much beyond 240 days per year will more closely resemble sawgrass marsh communities (Ross et al. 2006) which are unlikely to support sparrows in the long term.

Conversely, areas that are subjected to short hydroperiods generally have higher fire frequency than longer hydroperiod areas (Lockwood et al. 2003, Ross et al. 2006) and are readily invaded by woody shrubs and trees (Werner 1975, Davis et al. 2005). Both an increased incidence of fire and an increased density and occurrence of shrubs detract from the suitability of an area as sparrow habitat.

The local variability across the landscape within areas where sparrows occur produces a heterogeneous arrangement of different vegetation conditions that all provide habitat for sparrows during some environmental conditions. A complex relationship between hydrologic conditions, fire history, and soil depth determine the specific vegetation conditions at a site, and variation in these characteristics may result in a complex mosaic of vegetation characteristics (Taylor 1983, Ross et al. 2006). This variability is characteristic of the habitats that support sparrows.

Sparrows do not regularly occupy burned areas for 2 to 3 years following fires (Pimm et al 2002, Lockwood et al. 2005), though they can re-occupy areas after only 1 year under some conditions (Taylor 1983, Werner and Woolfenden 1983). This is probably because of the sparrow's dependence on some level of structural complexity that must develop to provide cover, support nests, and allow them to move through the habitat during wet periods. Fire is not uncommon within the areas occupied by sparrows, and nearly all areas where sparrows currently occur have been burned within the past 10 to 20 years (Lockwood et al. 2003). A combination of naturally ignited and human-ignited (both prescribed and arson/accidental ignitions) fires have resulted in different fire frequencies in different portions of the sparrow's range. Most of the vegetation species that occur within sparrow habitat are fire-adapted and respond quickly following fire (Snyder 2003). Several of the dominant grass species, including *Muhlenbergia*, also flower primarily following fires during the growing season (Main and Barry 2002). Under normal conditions, fires do not kill the individual plants that make up the dominant species in sparrow habitat, and fires only remove the above-ground growth and leaf litter (Snyder and Schaeffer 2004). Following fire, these plants sprout quickly and grow rapidly. Many of the dominant

grasses may grow more than 15 inches after only a few weeks (Steward and Ornes 1975, Snyder 2003). For this reason, the species composition and even the general structural characteristics of the vegetation may be nearly indistinguishable from unburned areas only 2 to 3 years after burning (Lockwood et al. 2005). A recent study by La Puma et al. (2007) found that sparrow density and nesting success did not increase in the years following a fire in one of the sparrow survey plots. This calls into question the belief that fire is necessary for maintaining sparrow habitat and demonstrates the need for continued research on the linkages between fire and demography of sparrows.

The interaction of fire and flooding strongly influence the suitability of habitat for sparrows. In extreme cases, vegetation that has burned and is subsequently flooded within 1 to 3 weeks, either because of a natural rainfall event or human-caused hydrologic changes, may not recover for up to 10 or more years (Michael Ross, Florida International University, personal communication 2006). Alternatively, if water levels overtop the sprouting grasses, the grasses may die, resulting in an absence of vegetation. Recovery of vegetation from these circumstances has to result from seed germination, which requires a longer time for recovery, and may result in a different plant species composition and structure from the vegetation that was present prior to the fire. Under less extreme conditions, vegetation may recover following fire more quickly when water levels are near the soil surface, providing ample water for the plants.

Population Dynamics

The first comprehensive, range-wide Cape Sable seaside sparrow survey was conducted in 1981, but they were not surveyed again until 1992. Since then, sparrows have been surveyed every year, including twice in 2000 (Pimm et al. 2002). Over this period, there have been substantial changes in most of the six subpopulations (Figure 5). In 1981, there was an estimated 6,656 sparrows distributed among the six subpopulations, with most of the sparrows occurring within three large subpopulations (A, B, and E) and three smaller subpopulations (C, D, and F) (Table 2). Subpopulation A occurred within the marl prairies west of Shark River Slough extending into Big Cypress National Preserve (BCNP) and supported an estimated 2,688 individuals. Subpopulation B contained about 2,352 sparrows inhabiting the marl prairies southeast of Shark River Slough near the center of ENP. Subpopulation B remains one of the most abundant and relatively stable subpopulations. Subpopulation E, north of Subpopulation B and also east of Shark River Slough, contained about 672 sparrows. Subpopulation C, located near Taylor Slough and along the eastern boundary of ENP, and Subpopulation D, just to the southeast of Subpopulation C, held about 400 sparrows each. Subpopulation F, located between Shark River Slough and the western edge of the Atlantic coastal ridge along the boundary of ENP, was the smallest subpopulation, with an estimated 112 sparrows.

In 1981 and 1992, the area west of Shark River Slough, where Subpopulation A occurs, supported nearly half of the total Cape Sable seaside sparrow population (Table 2). Subpopulation A has suffered dramatic sparrow population changes over time. Subpopulation A declined from more than 2,600 birds in 1992 to 432 birds in 1993, a decrease of 84 percent (Pimm et al. 2002). This subpopulation has remained at a low level since 1993. In 2001,

Subpopulation A declined again, from an estimated 400 to 448 sparrows in 2000 to 128 sparrows in 2001, or about a 68 percent decline. Since that time, Subpopulation A has remained at or below this level. More recently, Subpopulation A declined from an estimated 128 sparrows in 2003 to 16 sparrows in 2004. The population then showed some resilience and rebounded slightly in 2005 and 2006 to levels observed from 2001 to 2003. Small populations of sparrows are at risk from catastrophic events such as fire and significant rainfall during the breeding season. Despite the relatively low population size, the Service estimates Subpopulation A includes enough habitat to support roughly 1,000 birds.

In analyses of the reported population changes that have been recorded, Pimm et al. (2002) determined that the declines reported were substantial and unprecedented. Pimm et al. (2002) attributed the changes to the flooding events that occurred from 1993 to 1995, which were longer and larger than those recorded previously. Subpopulation A is the population that is most severely impacted by water management practices.

Subpopulation B has remained relatively constant over time. From 1981 to 2006, estimated population sizes have ranged from 1,888 to 3,184. While these numbers still span a range that is nearly a third of the total population size, there have not been consistent trends, either increases or declines.

The 1992 survey showed that Subpopulation C had also declined to about 11 percent of its 1981 estimated size (Table 2). After at least 2 years with no sparrows from 1993 to 1995, 48 sparrows were estimated in this area in 1996 and 1997, and 80 sparrows were estimated in 1998. Since then, this subpopulation has remained relatively stable. Recent estimates may suggest a slight population increase (160 sparrows estimated in 2006; see qualifier below).

Subpopulation D declined by about 76 percent from 1981 to 1993 (Table 2). Although no sparrows were found in 1995, the population was estimated at 80 sparrows in 1996 and 176 in 1999. Numbers have decreased since 1999 with 32 sparrows estimated in 2001. No sparrows were detected/observed within Subpopulation D from 2002 through 2004, but they were observed again in 2005. This area, has experienced high water levels that have precluded birds from successfully nesting. Subpopulation D remains at a low level and is vulnerable to significant events (*e.g.*, major rainfall during key parts of the breeding season).

Subpopulation E is the only other subpopulation, besides B, that has remained relatively stable. The Subpopulation has fluctuated more than Subpopulation B, varying by as much as 60 percent of its current population size, but it has rebounded following declines and appears to show a slight increasing trend since 2002, when the Lopez fire burned through a portion of the subpopulation's habitat, to present.

Subpopulation F has declined by about 71 percent from 1981 to 1992 (Table 2). No sparrows were observed in 1993 or 1995. Only 16 sparrows were estimated each year from 1997 to 1999. The Subpopulation increased in 2000 to an estimated 112 sparrows, but only 16 sparrows were estimated in 2004, when on-the-ground surveys did not detect evidence of successful breeding,

even late in the breeding season when females and young were readily detected in the larger subpopulations (ENP 2004).

Overall, there have been many large population declines recorded among all of the subpopulations and relatively few population increases. These population changes suggest that while declines can occur rapidly, it may take several years of favorable conditions to return a sparrow population to its previous status.

A recent study by Cassey et al. (2007) applied a different analytical method to the range-wide sparrow population survey data that has been collected yearly since 1992. Instead of viewing the data as abundance they chose to look at absence/presence trends within subpopulations that were then converted to occupancy. Results confirm the substantial population declines observed in the early 1990s. It is also apparent that the current occupancy has yet to recover to the levels seen prior to the decline. Subpopulation C is the only subpopulation that appears to be showing signs of increasing occupancy. Subpopulation D, located in the lower C-111 basin continues to decline.

Recent information indicates that sparrow Subpopulations C, D, and F may support fewer sparrows than previously estimated, and the demographics of these subpopulations may differ from the larger subpopulations (Lockwood et al. 2006). Results of intensive on the ground search and banding efforts presented at the 2007 Avian Ecology Workshop at Florida International University, by Dr. Rebecca Boulton, indicate that traditional helicopter surveys may be over estimating the number of sparrows in the smaller subpopulations. During 2006, the number of male sparrows estimated using the helicopter surveys were 10, 0, and 2 for Subpopulations C, D, and F, respectively. These numbers translate into a total male count of 80, 0, and 16 when multiplied by a factor of 8 (half of 16 used to estimate both males and females). However, actual on the ground surveys, returned only 14, 2, and 6 males for Subpopulations C, D, and F respectively.

This information affects our assessment of the likelihood of the persistence of these subpopulations and the overall probability of persistence of the sparrow. With lower population sizes in these smaller subpopulations than was previously assessed, the relative significance of Subpopulations B and E with respect to maintaining a viable overall sparrow population has increased. Similarly, our evaluations of the potential contributions of the small subpopulations to maintaining the overall sparrow population and buffering it from potential catastrophic events such as widespread fire are reduced. Subpopulation A, with its potential to support roughly 1,000 sparrows despite its current population size, remains particularly important.

Status and Distribution

The Cape Sable seaside sparrow was first discovered in the cordgrass (*Spartina* sp.) marshes on Cape Sable in 1918 and was originally thought to be limited in distribution to Cape Sable (Howell 1919). On September 2, 1935, a severe hurricane struck the Keys and southern Florida, with the hurricane's center passing within a few miles of Cape Sable (Stimson 1956). Post-hurricane observations suggest that in the vicinity of Cape Sable water levels resulting from the

storm surge rose about 8 feet above normal water levels, and the sparrow was thought to have disappeared from the area because of the storm, despite occasional reports of sparrows that could not be verified (Stimson 1956). Between 1935 and the 1950s, searches on Cape Sable failed to locate sparrows (Stimson 1956). Despite the fact that sparrows were again reported on Cape Sable in 1970 (Kushlan and Bass 1983, Werner and Woolfenden 1983), the habitat in the area had been changing significantly from cordgrass marshes to mangroves and mud flats since the 1935 hurricane, and sparrows are considered to have been extirpated from this area since 1981 (Kushlan and Bass 1983).

In 1928, Cape Sable seaside sparrows were reported to the northwest of Pinecrest, along the mainland coast of Florida, near what is today Everglades City (Nicholson 1928). The location of this mainland record was improperly reported, and the true location was not accurately reported until 1954 (Sprunt 1954). Stimson conducted extensive searches on the Florida mainland in the vicinity of the corrected 1928 sparrow observations and found sparrows to be widespread throughout both coastal cordgrass marshes (Werner and Woolfenden 1983) and freshwater prairies along the western edge of the Everglades (Stimson 1956). However, Stimson (1968) concluded in 1968 that widespread fires in this region had severely impacted the sparrows in that area, and he expected them to be extirpated from the area as a result.

In the early 1940s, Anderson (1942) reported sparrows in the coastal cordgrass marshes near Ochopee. Subsequent searches revealed that sparrows occurred south of Ochopee along the coastal marshes landward of the mangrove zone (Stimson 1956). Werner (1975) reported that habitat occupied by sparrows in the Ochopee area was changing from cordgrass marshes to other species, and mangroves were encroaching into the area. Werner's surveys from 1970 through 1975 (Werner 1975) revealed a decline in the number of sparrows and the amount of habitat available in the area. Sparrows were extirpated from this area by 1981 (Kushlan and Bass 1983), and there is little or no remaining suitable habitat in the area.

In 1972, Cape Sable seaside sparrows were discovered near Taylor Slough, east of the true Everglades (Ogden 1972). Subsequent investigation revealed that a sparrow had been reported in this area in 1958, but the observation was never verified (Werner 1975, Pimm et al. 2002). Werner conducted helicopter surveys in 1974 and 1975 to characterize the distribution and abundance of sparrows in this region. These initial surveys revealed that sparrows were widely distributed and abundant (Werner 1975). They occupied an area of about 21,745 to 31,629 acres, and the number of sparrows occurring within this area was estimated to range from 1,500 to 26,300 individuals (Werner 1975). Because of the magnitude of the area occupied and the large estimates of population size, ecologists concluded that sparrows probably occurred within this area for many years. The difficulty in accessing the areas, the vastness of the areas (Kushlan and Bass 1983), as well as the secretiveness of the sparrow contributed to the failure to document the sparrow's occurrence in these areas previously. The sparrow populations within these areas probably fluctuated over time in response to changes in habitat suitability resulting from fires and hydrologic conditions (Kushlan and Bass 1983, Taylor 1983). These fluctuations may have also contributed to the lack of sparrow detections in these areas previously.

The 1981 sparrow survey provided a good baseline on the distribution and abundance of sparrows at that time, and the 1992 survey results were remarkably similar, though there is no information available about how the population may have changed over the intervening 12 years.

Since 1992, the overall sparrow population has declined, and there has been no evidence of significant improvements. Subpopulations B and E have remained relatively stable, although notable annual variances have been observed. Subpopulation A numbers continue to decline, but the Service estimates that enough habitat is available to support up to 1,000 sparrows. In addition to the decline in overall numbers, the distribution has declined. The sparrow subpopulations that have declined have mostly contracted toward the center of the remaining habitat patches.

Small populations are particularly at risk from a catastrophic event or series of events, such as fire or major rainfall during the breeding season. About two thirds of the remaining Cape Sable seaside sparrows currently occur within Subpopulation B, which has remained relatively stable. However, if a large fire were to occur, there is a possibility the entire remaining Cape Sable seaside sparrow population may be reduced by 60 percent or more; the area has not burned in over a decade.

Maintaining and restoring habitat within the existing subpopulations appear to be the best means to reduce the likelihood of extirpation over time. Pimm et al. (2002) and Walters et al. (2000) suggested that three breeding subpopulations are critical to the long-term survival of the Cape Sable seaside sparrow. This number helps safeguard the overall species condition from a catastrophic event that could dramatically impact one subpopulation.

ENVIRONMENTAL BASELINE

Cape Sable Seaside Sparrow and Critical Habitat

The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation and the impact of State or private actions, which occur simultaneously with the consultation in progress.

The project area lies completely within the SDCS and is located adjacent to the ENP boundary to the west and the C-111 canal and urban and agricultural boundary to the east. The landscape is composed primarily of the C-111 canal; the S-332B, S-332C, and S-332D detention areas and pump stations; the Frog Pond agricultural area; and surrounding lands composed of agriculture and short hydroperiod marl marshes. Historically, the C-111 basin consisted of a natural Everglade's type landscape including sloughs, tree islands, marshes, and coastal mangrove fringe. Much of this land has been converted to active agricultural composed of fruit tree groves, row and field crops, and plant nurseries.

The hydrological regime employed in this area since 2001 has been the IOP. IOP is the emergency operating plan that all agencies agreed to implement in order to avoid further impacts to the Cape Sable seaside sparrow. The overall result of the plan has been positive for the sparrow especially in the western Subpopulation A which has been able to remain stable, all be it low, since the inception of the plan. The current operating plan has allowed some improvement in the eastern subpopulations that prior to IOP were too dry and therefore susceptible to wildfire. The intent of the proposed action is to create a hydrologic buffer between ENP and the C-111 canal such that water levels in the adjacent marshes can be maintained, while abnormally long and severe dry periods can be avoided.

Construction of the detention areas located between the existing S-332 B west and S-332 C detention areas and between the S-332 C and S-332 D detention areas were documented in the Corps' SEIS (2006) for IOP and scheduled to be built in 2007-2008. The Service's Biological Opinion (2006) documented the loss of 171.5 acres of designated sparrow critical habitat resulting from this action. The proximity of this area to adjacent agricultural areas makes it unlikely that sparrows will utilize it.

Status of the Species Within the Action Area

Cape Sable Seaside Sparrow and Critical Habitat

The action area encompasses that portion of the seaside sparrow's range that includes the eastern subpopulations F, C, and D. The information in the Status of the Species section for these subpopulations addresses the status of the species and critical habitat within the action area, and is incorporated here by reference.

Factors Affecting the Species Environment Within the Action Area

The C&SF Project is a system-wide network of canals and water-control structures located in south Florida and includes portions of several counties as well as ENP and BCNP. The Corps and District operate the C&SF Project to achieve a variety of local and regional objectives including flood protection, water supply, and environmental benefits. Operations of the C&SF Project affect the hydrologic conditions of nearly all the wetland systems within southern Florida, including the habitat supporting the Cape Sable seaside sparrow. The Service's 1999 Biological Opinion on Test 7 of the Experimental Program, the C-111 Project, and the MWD Project concluded that the Experimental Program jeopardized the continued existence of the Cape Sable seaside sparrow. It prescribed a RPA that included a hydrologic management regime that would protect sparrow breeding by reducing water deliveries in western marl prairies and increasing water deliveries to eastern marl prairies that had been historically overdrained.

The Corps implemented ISOP operations that achieved some of the benefits specified in the RPA, while meeting their requirement to maintain flood protection. In 2002, the Service issued an amendment to the 1999 Biological Opinion that adopted IOP as an RPA. Under IOP, hydrologic management provided reduced hydroperiods and reduced flows during the breeding season to sparrow habitat in the western marl prairies. Construction and operation of several

detention areas adjacent to sparrow habitat in the eastern subpopulations increased hydroperiods in some overdrained habitats. Many other hydrologic operations throughout the C&SF system that routinely occur have resulted in minor changes to hydrologic conditions in and adjacent to sparrow habitat. Pre-storm and post-storm operations, testing of hydrologic management operations, and other similar activities conducted by the Corps and District have also affected hydrologic conditions within sparrow habitat mainly through alteration of the natural timing of wetting and drying events.

Fire is a natural factor that affects marl prairies occupied by the sparrow and most sparrow habitats have burned at some point during the past 30 to 40 years. ENP, BCNP, and the Florida Fish and Wildlife Conservation Commission (FWC) have conducted prescribed burns within sparrow habitat. The Service has consulted with ENP on several prescribed fire plans. In addition, these agencies and the Florida Division of Forestry conduct wildfire suppression and management within sparrow habitat. In the short term, fires render sparrow habitat unsuitable for occupancy by sparrows because they remove the vegetation that sparrows rely upon for cover and refugia during periods when habitat is flooded. Following fire, vegetation normally begins to regrow rapidly and reaches pre-burn density and species composition about 2 years later. Sparrows do not regularly occupy burned areas for 2 to 3 years after fire (La Puma et al. 2007). ENP has conducted a prescribed fire in former sparrow habitat within the western marl prairies to facilitate habitat restoration. Within sparrow subpopulations, ENP has conducted wildfire suppression that was intended specifically to reduce potential impacts to sparrows and sparrow habitat within Subpopulation B. Prescribed burns have also been conducted along the eastern ENP boundary to reduce the likelihood of human-ignited fires spreading into sparrow habitat near Subpopulations C, E, and F. Because fires reduce habitat suitability for up to 3 years, both prescribed fires and wildfires can have adverse effects on sparrow populations.

Changes in vegetation composition can result from changes in hydrologic conditions, changes in fire frequency, and management actions. Many areas of sparrow habitat have experienced vegetation change since monitoring was initiated. Overdrying that results from maintaining artificially low water levels within areas of sparrow habitat, such as those that occur along on the eastern boundary of ENP, are subject to woody vegetation encroachment, which reduces the suitability for sparrow occupancy. Extended hydroperiods and deep inundation that result from managed water releases in combination with wet-season rainfall have resulted in changes in vegetation from marl prairie to marsh species, resulting in reduced habitat suitability. Extended hydroperiods have resulted in vegetation changes in portions of the western marl prairies in sparrow Subpopulation A and in the lower C-111 basin near Subpopulation D.

Invasive and exotic species may also affect sparrows. Invasive plant species such as *Melaleuca,* Australian pine, Brazilian pepper, and other woody species can become established in sparrow habitat and reduce habitat suitability. While limited information is available on the effects of invasive exotic animals on sparrows, species like the Burmese python (*Python molurus bivittatus*), which has become established near sparrow habitat, may depredate sparrows. Additional information is needed to evaluate the magnitude of potential threat from invasive animal species.

Management of invasive woody plants has been conducted by ENP, FWC, and the District in and adjacent to sparrow habitat to reduce impacts of these species on sparrow habitat suitability. Herbicide treatment of large stands of exotic trees has reduced the spread of these species and has improved sparrow habitat in some areas. These invasive plant species regrow rapidly requiring continuing maintenance controls. Efforts to remove invasive exotic animals like the Burmese python have also been conducted.

While direct physical disturbance to sparrow habitat and disturbance resulting from construction activities is limited because nearly all sparrow habitat occurs within ENP and other conservation lands, some construction activities have affected sparrows and sparrow habitat. Indirect effects of construction activities include noise and vibration disturbance from heavy earth moving equipment and a general increase in human presence in the project area. These disturbances could cause sparrows to take flight leaving their nests vulnerable to predation. From 2002 to present, construction of the S-332B, S-332C, and S-332D pump stations and associated detention areas in and adjacent to sparrow habitat has resulted in impacts to sparrow habitat and possibly indirect effects to sparrows. Similarly, construction activities associated with the replacement of the Taylor Slough Bridge in ENP may have had indirect effects on sparrows through disturbance. Construction and maintenance of roads, canals, and levees near sparrow habitat may result in direct and indirect effects to sparrows through loss or degradation of habitat or disturbance.

Critical Habitat

Construction of the S-332B North and West Detention Areas and the associated pumps occurred within designated sparrow critical habitat. In total, the construction of these features resulted in the loss of about 471.5 acres of critical habitat. These features were built within abandoned agricultural fields that were overgrown with shrubs and weedy vegetation not suitable for use by sparrows. Construction consisted of scraping the soil to create levees around the detention areas and construction of elevated pads for pumps and associated infrastructure

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and critical habitat and its interrelated and interdependent activities.

Cape Sable seaside sparrow

Construction Effects

The proposed action includes construction activities involving the use of heavy earth-moving and other equipment. The proposed L-31W tieback levee, L-31W backfilling, and the Aerojet plugs are directly adjacent to known Cape Sable seaside sparrow breeding habitat. Due to the proximity of proposed construction activity to these habitats, the Service believes that Cape Sable seaside sparrow individuals could be adversely affected by physical disturbance and/or noise disturbance resulting from these construction activities if they occur during the breeding season and sparrows are actively engaged in breeding activities nearby. Such a disturbance

could cause nesting sparrows to be flushed from their nests, increasing the likelihood that unattended eggs or nestlings could be lost to predation. This disturbance would also reduce the reproduction potential of adult sparrows flushed from nests through a significant disruption of essential breeding behavior. The Corps has agreed to implement a Construction Monitoring Plan for Cape Sable seaside sparrows during construction activities that would minimize and in this case eliminate any adverse impacts to sparrow breeding activities.

Hydrological Effects

With the exception of backfilling the L-31W borrow canal and plugging the Aerojet canal the other proposed features can be maintained in a state that will not alter the hydrology or hydraulics of adjacent wetlands occupied by sparrows.

Backfilling the L-31W borrow canal and plugging the Aerojet canals will have both direct and long-term effects on water levels in adjacent marshes. Direct effects include the initial displacement of the water in the L-31W canal with fill material. Based on information supplied in the C-111 EDR, and assuming a 30 percent void space for fill material, the total volume of water displaced is approximately 1700 and 800 acre-feet, for total and partial back-filling respectively. Based on an assumed construction schedule of 20 days, the direct effects in the form of increased water levels at sparrow nests in close proximity to the canal are not anticipated.

Long-term effects on local hydrology are likely because the L-31W borrow canal acts as a "drain," collecting seepage water from both the surrounding marsh to the west and the S-332D detention reservoirs to the east. Surface and groundwater gradients in the area are typically from ENP wetlands to the east and south. Seepage from Taylor Slough that is removed by L-31W is conveyed to the C-111 canal or wetlands at the terminus of the Aerojet canal. Results from the Rocky Glades hydrologic model, a ModHMS application provided to the Service by ENP indicate that water levels in adjacent marshes will increase when the L-31W is removed. Water levels in marshes adjacent to the canal are likely to increase by up to 0.3 ft (3.6 in) (Figure 6). As the distance from the L-31W canal increases water levels decrease. At a distance of 1000 ft from the canal simulated water level differences are less then 0.1 ft (1.2 in). For meteorological conditions ranging from average to the drier end of the rainfall spectrum, the increases and resultant hydropatterns are consistent with the ecological function of Taylor Slough.

Backfilling the L-31W and plugging the Aerojet canals have the potential to provide both hydrologic benefits and impacts to adjacent marshes occupied by sparrows and other species. The benefits include attenuation of flood control operations in the L-31 N and C-111 canals and their effect on the hydrology of Taylor Slough and Cape Sable seaside sparrow Subpopulation C. Backfilling the canal increases the distance between direct discharges of storm water run-off directly on to sparrow habitat. In addition, as noted previously, the reduction in dry season seepage loss from ENP wetlands to the L-31W, Aerojet, and C-111 canals will extend the onset of the dry season recession and improve recession rates to better meet ecological faunal and floral needs of Taylor Slough.

Potential impacts to sparrows and their habitat could occur during periods of increased rainfall (*i.e.* El Nino years). During periods of extreme rainfall higher water levels that result from backfilling the L-31W canal and plugging the Aeroject canal may extend farther west into ENP and Subpopulation C habitat than shown in Figure 6. The model application period of simulation did not include a representative sampling of these years. Time series for the period of simulation indicates that increased water levels are observed through the annual hydrologic cycle and the increase in stage in response to a rainfall event may be a function of the magnitude, intensity and duration of the rainfall event itself. Therefore, during years of increased rainfall the removal of the L-31W canal and addition of Aerojet plugs may potentially contribute to hydrologic conditions which reduce nest success. In addition, these periods of increased water depths and duration may result in vegetation shifts away from those needed for successful sparrow breeding.

Cape Sable seaside sparrow Critical Habitat

This Biological Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

The completion of all S-332 pumps and reservoirs that are reflected in the fully built C-111 will directly affect Cape Sable seaside sparrow designated critical habitat. Construction of the proposed features will result in the loss of 480 acres of designated critical habitat near sparrow Subpopulation F. This impact is predominantly due to the expansion of the NDA from its original 240 acres to 1,441 acres that would extend from the northern tip of S-332 B North to the S-357 STA on the south side of the 8.5 SMA. This entire area is former agricultural land that is owned by the District, the non-Federal sponsor of the C-111 Project. The reconfigured C-111 NDA would extend the hydraulic ridge created by the C-111 Project north to the 8.5 SMA and benefit ENP by reducing seepage loss in this area. The NDA would also improve water quality in ENP by preventing direct discharge of surface water from former agricultural lands into the park.

Once constructed, water levels within the detention areas will be deeper than what normally supports sparrow habitat; consequently, the structural features will eliminate 480 acres of unsuitable sparrow critical habitat in the vicinity of Subpopulation F. Whereas, the construction of the S-332 detention areas is expected to result in improved hydroperiods within the adjacent marshes and remaining 11,319 acres of designated critical habitat. The impacts to critical habitat resulting from C-111 construction will affect less than 1 percent of the total area designated as critical habitat.

Interrelated and Interdependent Actions - There are no interdependent or interrelated actions associated with the proposed action that are expected to affect Cape Sable seaside sparrows.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future

Federal actions that are unrelated to the proposed action are not considered in this section because they will require a separate consultation pursuant to section 7 of the Act.

Most of the lands in the action area for the Cape Sable seaside sparrows are federally-owned and managed. Therefore, the majority of potential affects to Cape Sable seaside sparrows and their habitat, including designated critical habitat, are anticipated to be related to future Federal actions that will require a separate consultation. Therefore, the Service does not anticipate any cumulative effects.

CONCLUSION

Cape Sable seaside sparrow

After reviewing the current status of the Cape Sable seaside sparrow and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Cape Sable seaside sparrow. Though the potential for adverse affects to sparrows, due to higher water levels in adjacent marshes, is present, the Service believes that the level to which increased water depths and durations increase will not result in additional incidental take above that anticipated under the 2006 Biological Opinion for the IOP. Should the threshold for incidental take outlined in the 2006 Biological Opinion for IOP be exceeded, the Corps and Service should reinitiate formal consultation in order to determine whether the IOP, or the IOP in conjunction with the proposed action resulted in the take and determine what actions are necessary to avoid future takings.

Cape Sable seaside sparrow Critical Habitat

Construction of the C-111 features will result in adverse effects to 480 acres of designated critical habitat, but this is not expected to result in the destruction or adverse modification of the sparrow's critical habitat. The habitat that will be affected is composed of active agricultural land that has not been suitable sparrow habitat for decades. Additionally, the percentage of critical habitat that will be impacted is relatively small compared to the remaining suitable sparrow habitat.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends:

1. The Corps implement the standard construction measures for the eastern indigo snake and the CERP Manatee Guidelines to protect these species during construction.

2. The Corps determine the presence or absence and location of Cape Sable seaside sparrows, plan construction activities to avoid periods when sparrows are more susceptible to disturbance, and implement measures to reduce disturbance during construction.

3. Due to the uncertainty in the construction schedule (*i.e.*, sequencing, duration and timing of construction activities), variability in inter- and intra-annual rainfall, and inter-annual variability in sparrow nest location, that (1) construction activities associated with canal backfilling be conducted outside of the sparrow breeding season or (2) when water levels in the canal are well below the regional ground surface elevation.

4. The Corps conduct testing under controlled conditions to determine the effects of operating the pumps, structures, and reservoirs throughout the L-31 N and C-111 basin. Specifically, the operation of the S-332 D pump station in relation to backfilling the L-31 W canal should be monitored with regards to effects on adjacent marsh habitats and the species that occupy them. Determining what effects, if any, result from the operation of the S-332 D and other structures in the C-111 basin on habitats and the species that occupy them will allow the Corps to minimize impacts from future construction and operations in this area.

5. The Corps develop and implement a monitoring and adaptive management plan for the interim operation of this system until all restoration projects in the area can be brought on line and the uncertainty regarding such actions reduced.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Service does not anticipate that the proposed action will incidentally take any Cape Sable seaside sparrows. Therefore, the Service has not established any Reasonable and Prudent Measures or associated Terms and Conditions for this action.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the Biological Assessment. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the Corps' action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the Corps' action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Thank you for your cooperation and effort in protecting fish and wildlife resources. If you have any questions regarding this project, please contact me at 722-562-3909.

Sincerely yours,

Paul Souza
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Table 1. List of acronyms and abbreviations used.

8.5 SMA	8.5 Square Mile Area
Act	Endangered Species Act of 1973, as amended
AOU	American Ornithologists' Union
BCNP	Big Cypress National Preserve
BA	Biological Assessment
BO	Biological Opinion
C-111	Canal 111
C&SF	Central and Southern Florida Project
CERP	Comprehensive Everglades Restoration Plan
CEQ	Council on Environmental Quality
CFR §	Code of Federal Regulations section
cm	centimeters
Corps	U.S. Army Corps of Engineers
CSOP	Combined Structural and Operational Plan
District	South Florida Water Management District
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EDR	Engineering Documentation Report
EIS	Environmental Impact Statement
ENP	Everglades National Park
ft	foot
FWC	Florida Fish and Wildlife Conservation Commission
GDM	General Design Memorandum
GRR	General Reevaluation Report
IOP	Interim Operational Plan
ISOP	Interim Structural and Operational Plan
MWD	Modified Water Deliveries project
NDA	North Detention Area
NEPA	National Environmental Policy Act
NPS	National Park Service
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
SDA	South Detention Area
SDCS	South Dade Conveyance System
SEIS	Supplemental Environmental Impact Statement
Service	U.S. Fish and Wildlife Service
STA	Stormwater Treatment Area
TSP	Tentatively Selected Plan
USIECR	U.S. Institute for Environmental Conflict Resolution
WCA	Water Conservation Area

Table 2. Estimated Total Numbers of Cape Sable Seaside Sparrows within six subpopulations, A through F from 1981 to Present (Two Surveys Conducted in 2000).

Year	Subpopulation						Total
	A	B	C	D	E	F	
1981	2,688	2,352	432	400	672	112	6,656
1992	2,608	3,184	48	112	592	32	6,576
1993	432	2,464	0	96	320	0	3,312
1994	80	2,224	NE	NE	NE	NE	2,416
1995	240	2,128	0	0	352	0	2,720
1996	384	1,888	48	80	208	NE	2,624
1997	272	2,832	48	48	832	16	4,048
1998	192	1,808	80	48	912	16	3,056
1999	400	2,048	144	176	768	16	3,552
2000a	448	1,824	112	64	1,040	0	3,488
2000b	400	2,448	64	16	704	112	3,744
2001	128	2,128	96	32	848	32	3,264
2002	96	1,904	112	0	576	16	2,704
2003	128	2,368	96	0	592	32	3,216
2004	16	2,784	128	0	640	16	3,854
2005	96	2,272	80	48	576	32	3,104
2006	112	2,080	160	0	704	32	3,088
2007*	64	2,512	48	0	560	0	3,184

NE = not estimated. * 2007 estimates are draft and were reported by ENP at the Avian Ecology Workshop, Florida International University, August 13-15, 2007.

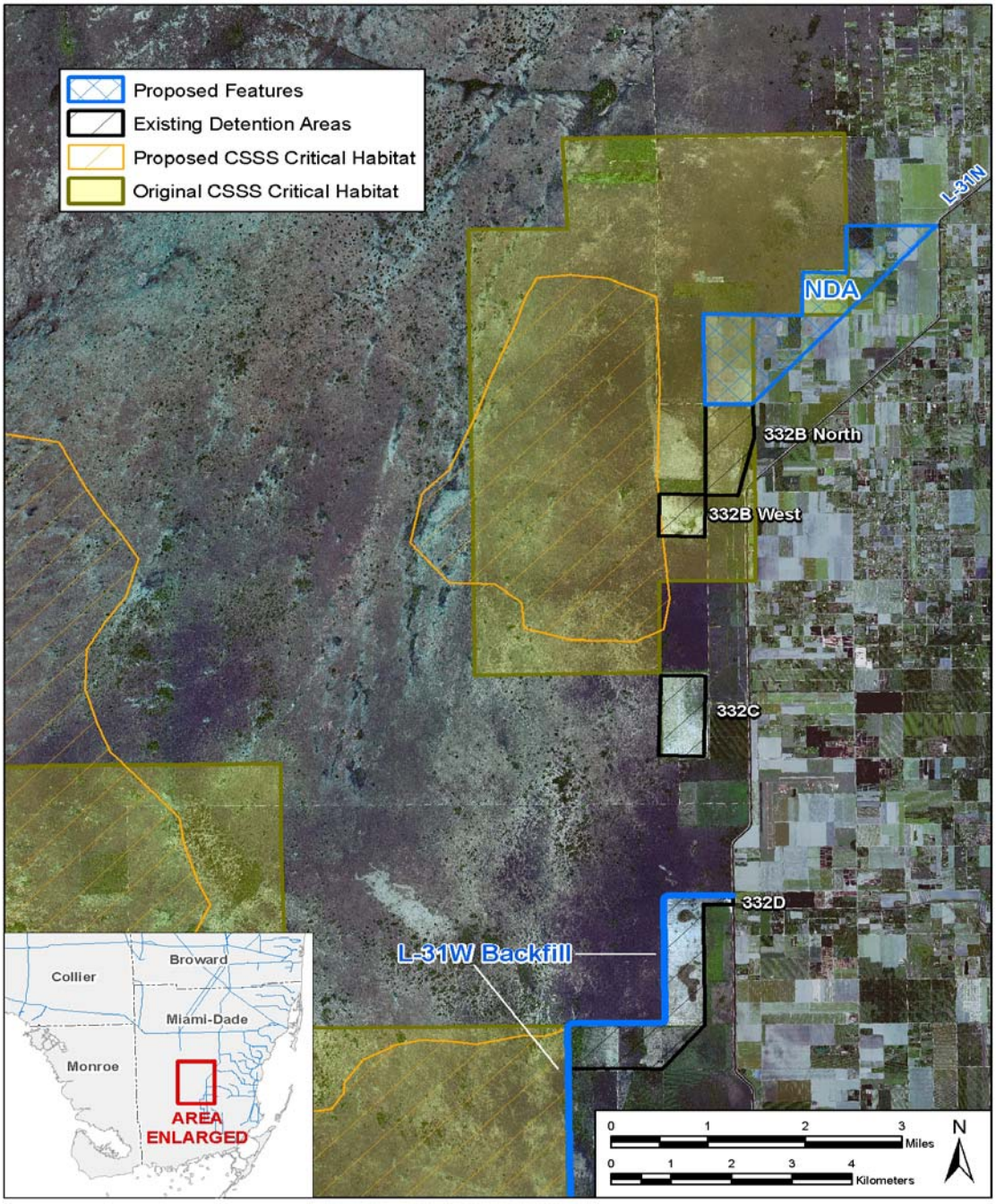

Figure 1. General map of the C-111 Project area showing existing and major proposed features of the C-111 Project. Also shown is the current and proposed Cape Sable seaside sparrow critical habitat areas.

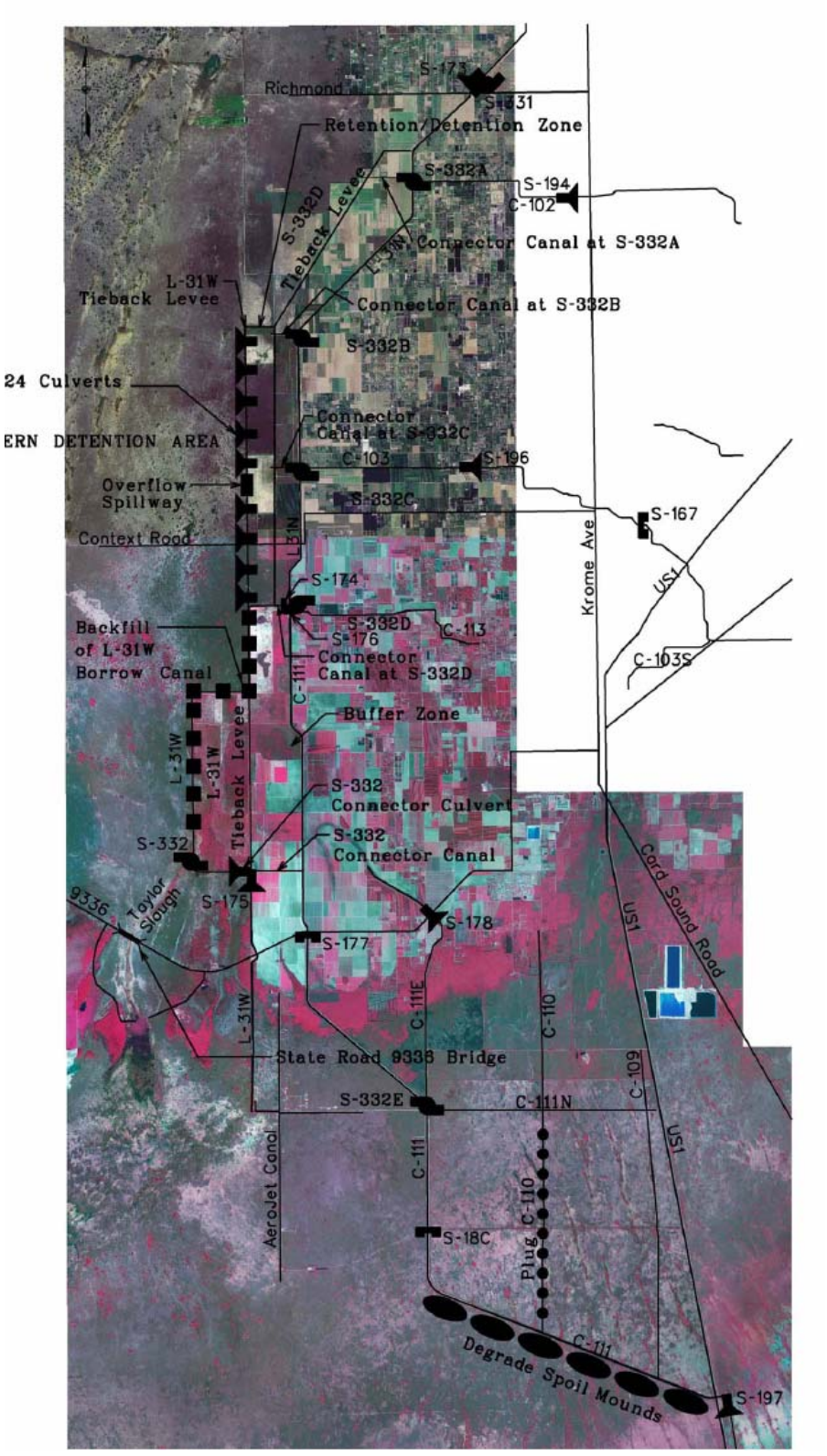

Figure 2. The 1994 GRR Plan.

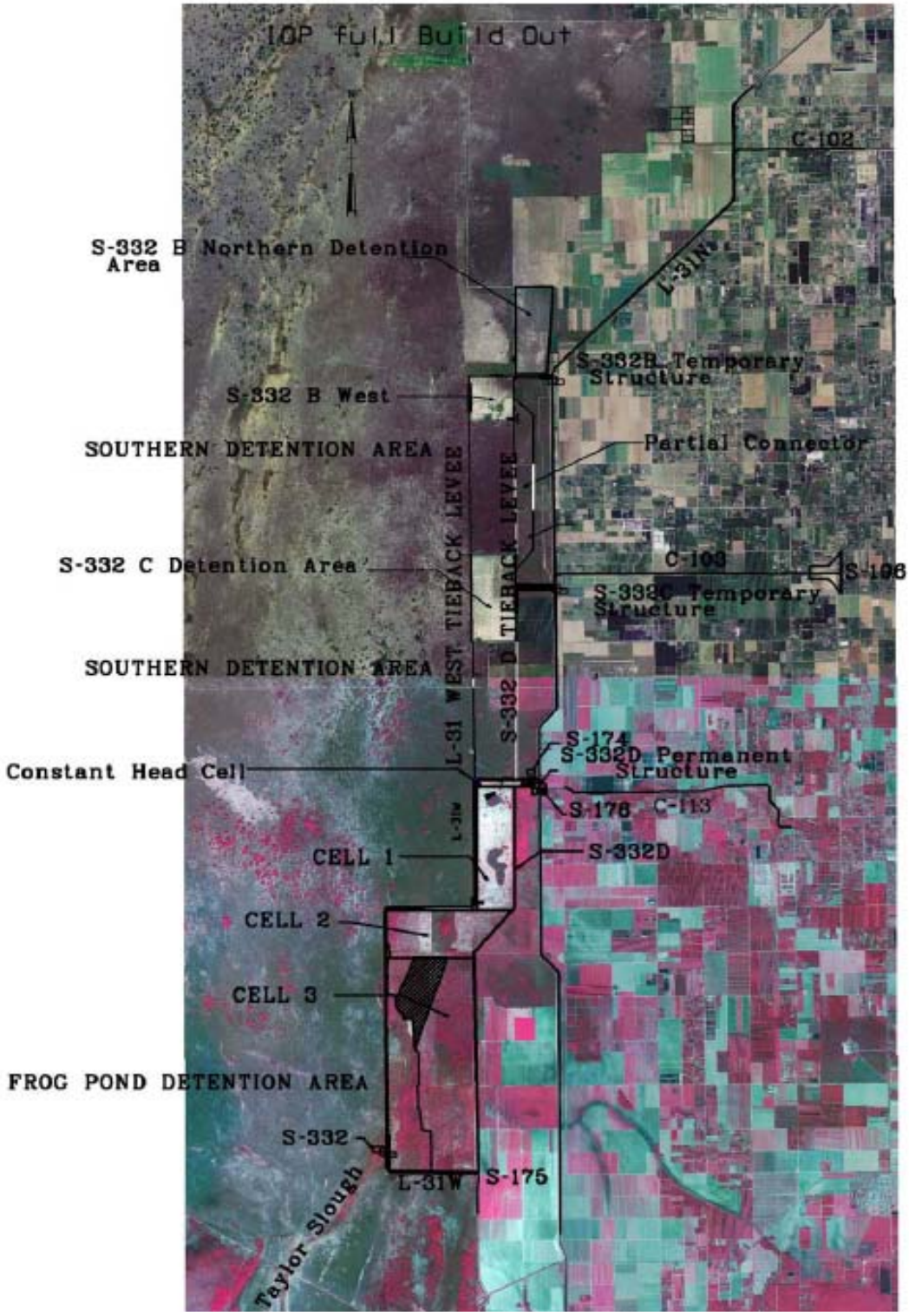

Figure 3. IOP full build out.

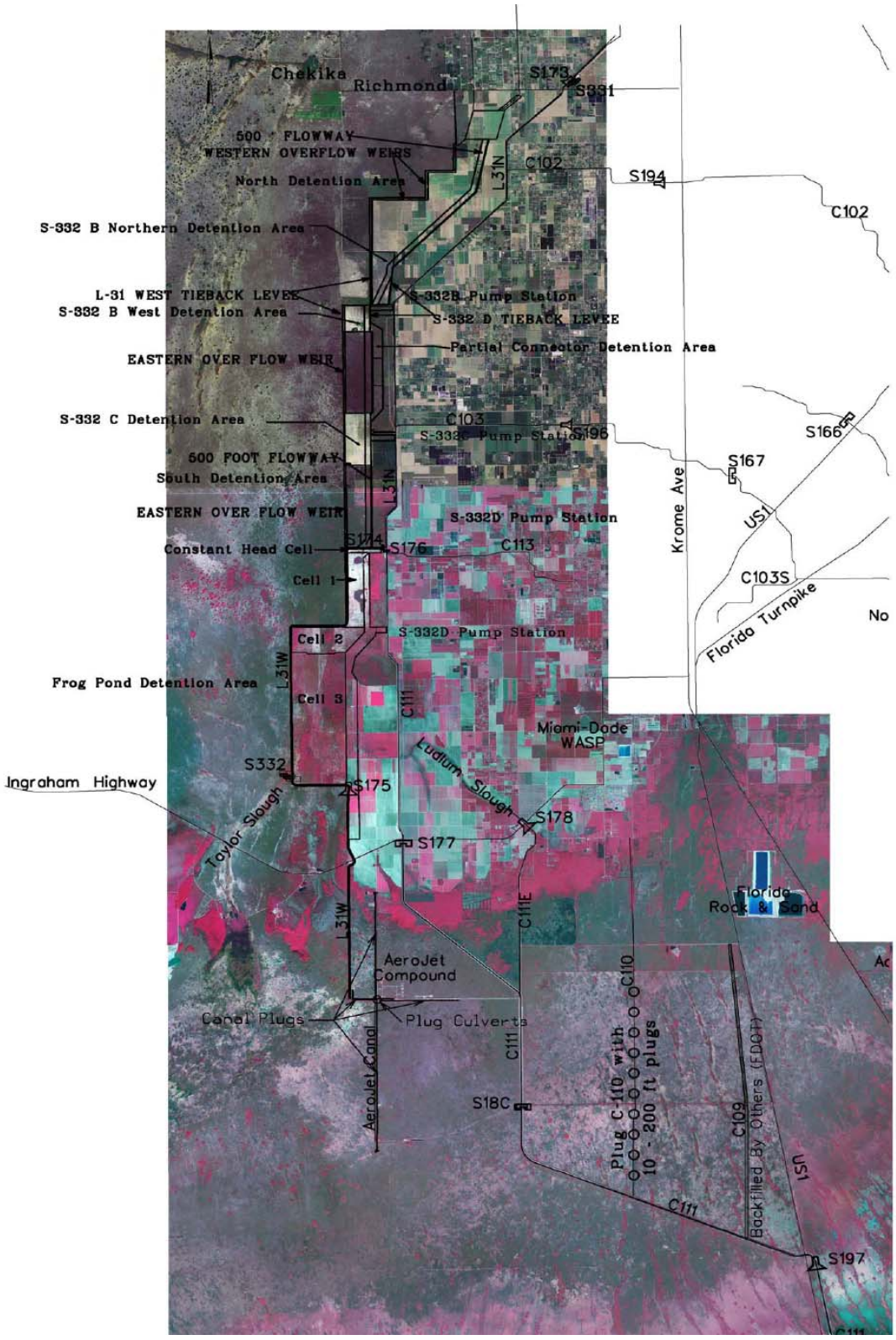

Figure 4. C-111 EDR plan

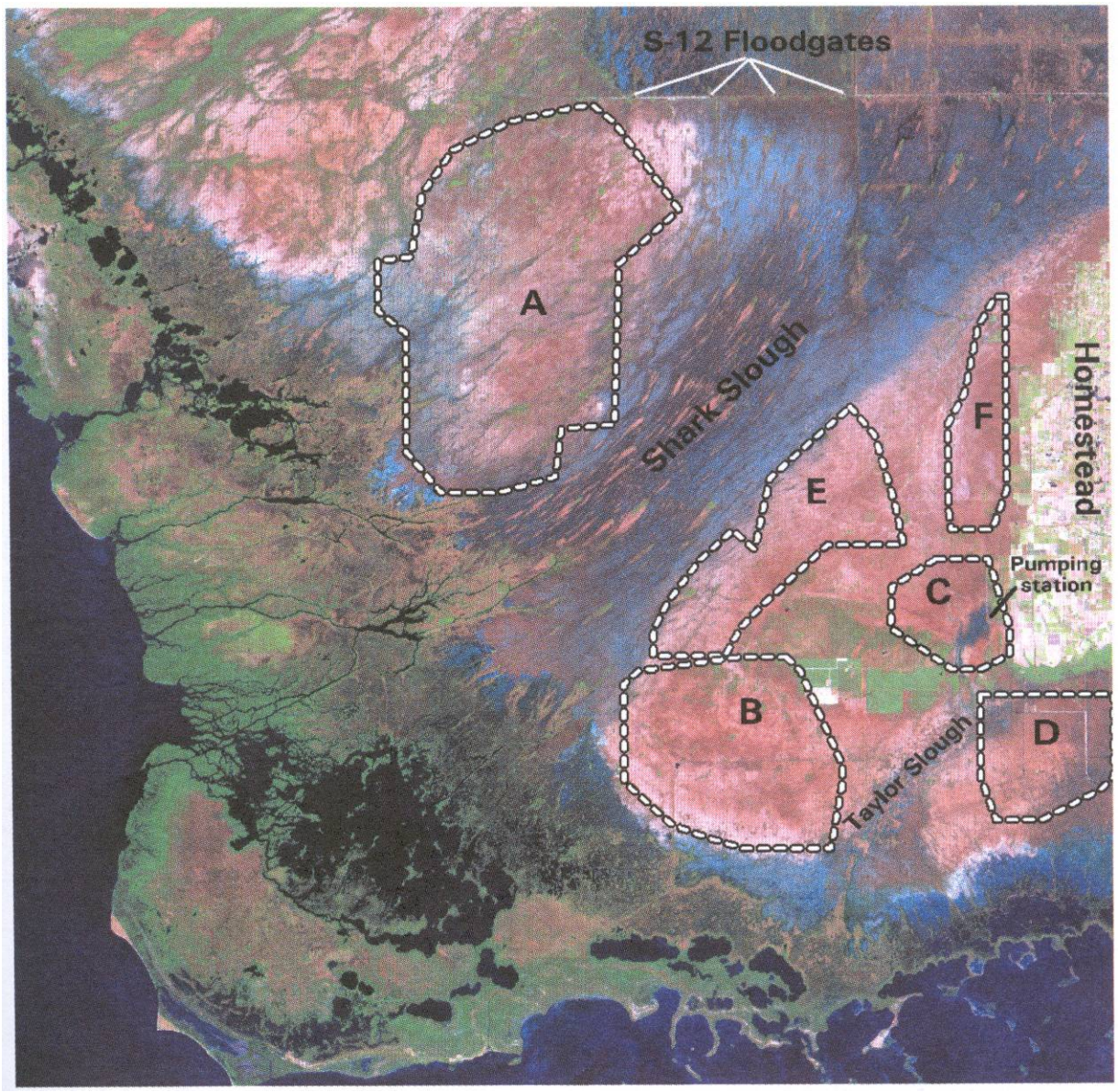

Figure 5. Cape Sable seaside sparrow subpopulation locations.

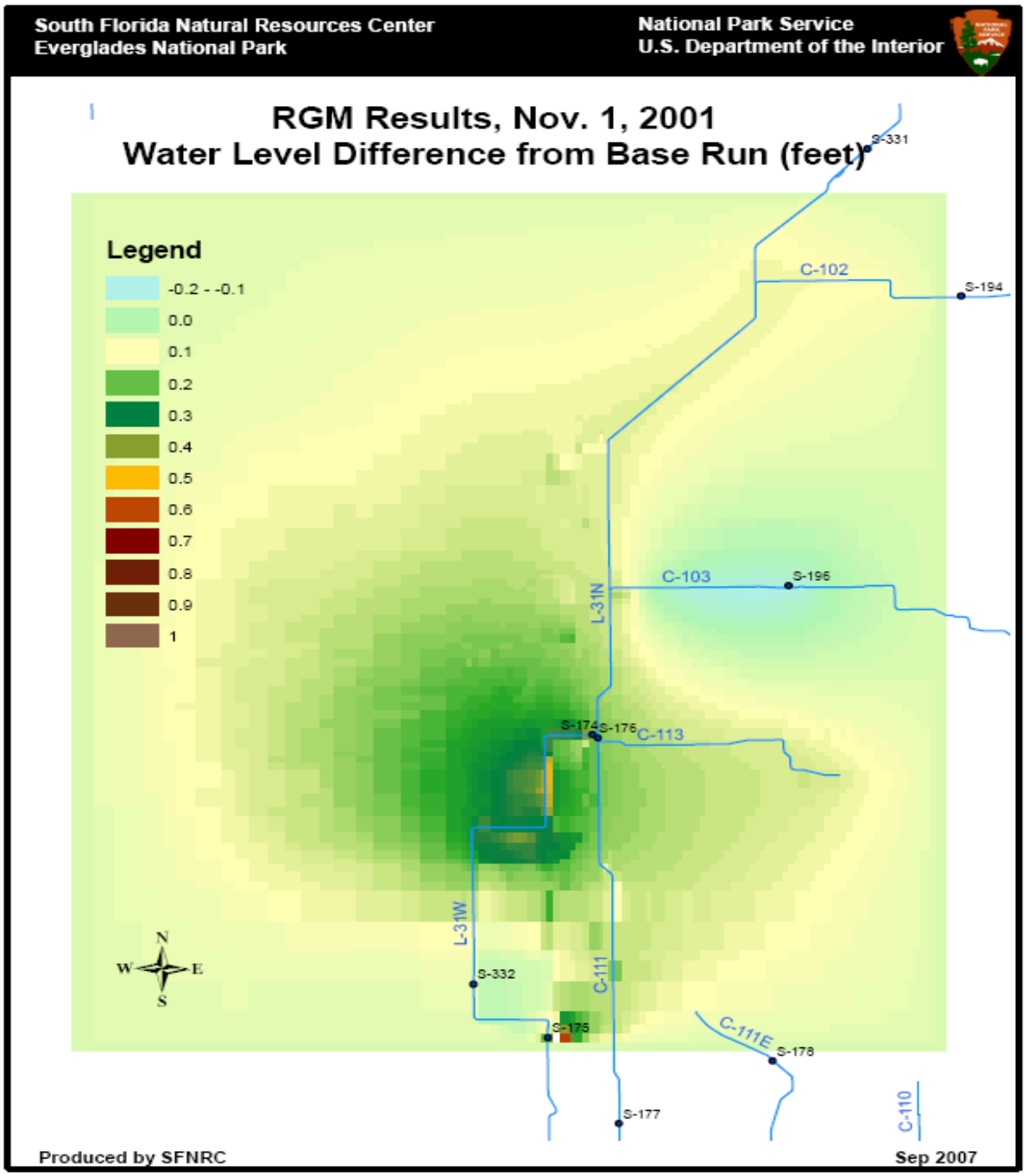

Figure 6. Simulated difference in stage (ft) between ModHMS existing condition that includes the L-31W and a scenario that does not include L-31W, positive values indicate higher water levels in the without L-31W scenario compared to the existing condition.