

Cape Sable Seaside Sparrow

Ammodramus maritimus mirabilis

August 26, 1999

**BEFORE THE
SECRETARY OF THE UNITED STATES
DEPARTMENT OF INTERIOR
and
THE DIRECTOR OF THE UNITED STATES
FISH AND WILDLIFE SERVICE**

Biodiversity Legal Foundation	)	Petition for a Rule to revise Critical Habitat
P.O. Box 278	)	for the Cape Sable Seaside Sparrow,
Louisville, CO 80027	)	<i>Ammodramus maritimus mirabilis</i> , pursuant
(303) 926-7606	)	to the Endangered Species Act, 16 U.S.C. §§
	)	1531-1544 and the Administrative Procedure
Florida Biodiversity Project	)	Act, 5 U.S.C. § 553(e).
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I. INTRODUCTION

The Biodiversity Legal Foundation, the Florida Biodiversity Project, Brian Scherf, Rosalyn Scherf, and Sidney B. Maddock ("Petitioners"), pursuant to section 4(b) of the Endangered Species Act, 16 U.S.C. § 1533(b), and the Administrative Procedure Act, 5 U.S.C. § 553(e), petition the Secretary, United States Department of Interior ("Secretary") and the Director, the United States Fish and Wildlife Service ("Service" or "FWS") to revise the critical habitat designation for an endangered species, the Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*).

Since the Service designated critical habitat in 1977, research has resulted in significant additional ornithological and hydrological information. From this information, it is now clear that the existing designation of critical habitat is deficient in two aspects. First, the Service should revise the boundaries of the designated critical habitat to include the historical extent of the habitat of subpopulation A, which is found west of Shark River Slough. While subpopulation A is crucial to the Cape Sable seaside sparrow's ("sparrow") continued existence and recovery, this subpopulation has not received the statutory protection afforded by critical habitat. Second, the Service should revise the existing designation to include a detailed discussion of the constituent elements of critical habitat, as well as the special management considerations that this habitat and other areas of currently designated critical habitat require.

The sparrow's severe decline over the last eight years has made this rulemaking petition necessary. Despite the fact that the sparrow is found almost exclusively within the boundaries of Everglades National Park ("ENP") and Big Cypress National Preserve

("BCNP"), we nevertheless are close to losing the sparrow to extinction. Even the Service – which is usually very conservative in its statements – has reached similar conclusions. In 1995, the Service issued a finding that the U.S. Army Corps of Engineers' Experimental Program of Water Deliveries to Everglades National Park jeopardizes the continued existence of the sparrow. Service, Biological Opinion on the Experimental Program of Water Deliveries to Everglades National Park (1995)(Exhibit 1). Four years later, the Service stated in the sparrow component of the Multi-Species Recovery Plan that:

this combination of an approximately 90 percent decline in the western core subpopulation, a 60 percent decline in the overall sparrow population, and the significant risk of catastrophic fire in the sparrow's remaining core subpopulation B, has led the FWS to conclude that this subspecies is at a significant risk of imminent extinction.

Service, Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida, Volume 1 of 2, The Species 4-360 (1999)("MSRP")(Exhibit 2).

The sparrow's imperiled status has not come about by chance; instead, it is the predictable result of a severely degraded ecosystem that is in the process of collapse. As discussed below, the South Florida Water Management District (and its predecessor, the Central and Southern Florida Flood Control District), the U.S. Army Corps of Engineers ("Corps"), and others have drastically modified the hydrology of the historical Everglades through the construction and operation of the Central and Southern Florida Project ("C&SF Project"). Among other changes, these agencies have drastically altered the timing, distribution, and amounts of flows in Shark River Slough and Taylor Slough.

These modifications have devastated the plant and animal species that depend on the Everglades.

Within the last two decades in Florida, we have already witnessed the extinction of one seaside sparrow, the Dusky seaside sparrow. See Mark J. Walters, *A Shadow and a Song: the Struggle to Save an Endangered Species* (1992). Despite the lessons that should have been learned from the Dusky seaside sparrow debacle, state and federal agencies still have failed to take the necessary steps to stop the Cape Sable seaside sparrow's decline. There have been some important actions, such as the completion of important biological and hydrological research and the purchase of certain lands. And, certain individuals, both inside and outside of the agencies, have worked hard to conserve the sparrow. Nevertheless, these important efforts have been frustrated by the longstanding refusal of state and federal agencies to implement critically needed hydrological changes and other management actions.

This rulemaking petition is part of a multi-faceted approach to require state and federal agencies to implement management actions to prevent the sparrow's extinction and ensure its recovery. Pursuant to the requirements of section 4(b) of the Endangered Species Act ("ESA"), 16 U.S.C. § 1533(b), the submission of this petition sets in motion a legal process that requires the Service to address – under specific statutory deadlines – the issues that are central to the sparrow's conservation.

II. PETITIONERS AND THEIR INTERESTS

The Biodiversity Legal Foundation ("BLF") is a non-profit, science based conservation organization dedicated to the preservation of all native wild plants and

animals, communities of species and naturally functioning ecosystems. Through reasoned educational, administrative and legal actions, the BLF endeavors to encourage improved public attitudes, policies, and actions for all living things. Staff and supporters of the BLF have recreational, aesthetic, environmental, and scientific interests in the sparrow and its habitat, and use the habitat for recreation and environmental activities, including looking and listening for sparrows in the wild. In addition, members of the BLF staff monitor habitat conditions and trends for the Cape Sable seaside sparrow.

The Florida Biodiversity Project ("FBP") is a non-profit organization incorporated under the laws of Florida. The FBP was founded to focus on the preservation of native plants and animals in Florida, with a particular emphasis on species in south Florida and their habitats.

Brian and Rosalyn Scherf live in Hollywood, Florida. Mr. and Mrs. Scherf are board members of the FBP, and through the FBP and other organizations, they have worked for several decades to protect native species in southern Florida. They frequently hike or camp in southern Florida and observe, or attempt to observe, Cape Sable seaside sparrows. Mr. and Ms. Scherf have recreational, esthetic, and scientific interests in the sparrow, Everglades National Park, and Big Cypress National Preserve that are being injured by the Service's inadequate designation of critical habitat.

While Sidney Maddock was born and raised in southern Florida, he now lives in Buxton, North Carolina, where he works for the BLF as an environmental analyst. He has worked for over a decade to conserve listed and sensitive species and their habitats in Florida. Mr. Maddock travels frequently to Florida, where he has observed the sparrow and

other species in Everglades National Park and Big Cypress National Preserve, and he closely monitors habitat conditions and trends. He intends to continue traveling to Florida in the future to observe and listen for sparrows and other species, and to continue to monitor habitat conditions. Mr. Maddock has recreational, esthetic, and scientific interests in the sparrow, Everglades National Park, and Big Cypress National Preserve that are being injured by the Service's inadequate designation of critical habitat.

III. STATUTORY FRAMEWORK: THE ENDANGERED SPECIES ACT AND THE ADMINISTRATIVE PROCEDURE ACT

This section of the petition briefly reviews the purposes of the Endangered Species Act ("ESA"), the listing and critical habitat designation process, substantive protections provided by the ESA, and the provision of the Administrative Procedure Act that allows people to petition for the issuance of a rule.

A. THE PURPOSES OF THE ENDANGERED SPECIES ACT

While the Endangered Species Preservation Act of 1966, Pub. L. No. 86-699, 80 Stat. 926, and the Endangered Species Conservation Act of 1969, Pub. L. No. 91-135, 83 Stat. 275, laid the framework for federal efforts to conserve endangered species, Congress recognized in 1973 that existing law "simply d[id] not provide the kind of management tools needed to act early enough to save a vanishing species." S. Rep. No. 307, 93rd Cong., 1st Sess. 3 (1973). Accordingly, in enacting the ESA, Congress intended to "widen the protection which can be provided to endangered species." H. R. Rep. No. 412, 93rd Cong., 1st Sess. 1 (1973). "As it was finally passed, the Endangered Species Act of 1973 represented the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." Tennessee Valley Authority v. Hill, 437 U.S. 153, 180 (1978).

Congress understood that “[t]hroughout the history of the world, as we know it, species of animals and plants have appeared, changed, and disappeared,” but at the same time, Congress believed that the disappearance of species appeared to be accelerating. H. R. Rep. No. 412, 93rd Cong., 1st Sess. 4 (1973). As the Committee on Merchant Marine and Fisheries noted, this belief provided “an occasion for caution, for self-searching and for understanding. Man’s presence on the Earth is relatively recent, and his effective dominion over the world’s life support systems has taken place within a few short generations. Our ability to destroy, or almost destroy, all intelligent life on the planet became apparent only in this generation. A certain humility, and a sense of urgency, seem indicated.” *Id.*

In light of this concern, Congress intended that the ESA “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species....” 16 U.S.C. § 1531(b). In turn, “conserve” was expansively defined as the “use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the ESA] are no longer necessary.” *Id.*

B. THE LISTING AND CRITICAL HABITAT DESIGNATION PROCESS

“The listing process under Section 4 is the keystone of the Endangered Species Act... The proper operation of this section is critical to the implementation of the Act, as it determines which species receive the protections of the Act.” H. R. Rep. No. 567, 1982 U.S.C.C.A.N. 2810, 2819. An “endangered species” is one which is “in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta

determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man." 16 U.S.C. § 1532

(6). While the term "species" is used throughout the ESA, the scope of the statute is actually broader, for the term is defined to include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." Id. at § 1532(20).

To the maximum extent practicable, within 90 days after receiving the petition of an interested person to add a species to the lists of endangered and threatened species, the Secretary shall make a finding as to whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted. Id. at § 1533

(b)(3)(A). If the petition is found to present such information, the Secretary shall promptly commence a review of the status of the species. Id.

After the 90-day finding is made, the next steps in the administrative process more explicitly link the listing determination and the critical habitat designation decisions. By statute, critical habitat is defined as:

- (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
- (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.

Id. at § 1532(5). The determination of critical habitat shall be based on the best scientific data available. 50 C.F.R. § 412.12.

Within 12 months after receiving a petition that is found under section 4(b)(3)(A) to present substantial information indicating that the petitioned action is warranted, the Secretary shall make one of three findings: that the petitioned action is not warranted, that the petitioned action is warranted, in which case the Secretary publishes the proposed regulation in the Federal Register, or that the petitioned action is warranted but precluded. 16 U.S.C. §1533(b)(3)(B).

Within the one-year period beginning on the date the general notice is published regarding a proposed regulation, the Secretary shall publish in the Federal Register, if a determination as to whether a species is endangered or threatened, or a revision of critical habitat, is involved, either a final regulation to implement the determination, a final regulation to such revision or a finding that such revision should not be made, notice that the one-year period is being extended, or notice that the proposed regulation is being withdrawn. *Id.* at § 1533 (b)(6)(A). If the Secretary finds with respect to a proposed regulation that there is a substantial disagreement regarding the sufficiency or accuracy of the available data relevant to the determination or revision concerned, the Secretary may extend the one-year period for not more than six months for the purposes of soliciting additional data. *Id.* at § 1533 (b)(6)(B)(i).

The Secretary, in designating critical habitat, shall identify any significant activities that would either affect an area considered for designation as critical habitat or be likely to be affected by the designation, and shall, after proposing designation of such an area, consider the probable economic and other impacts of the designation upon proposed or ongoing activities. 50 C.F.R. § 424.19. The Secretary may exclude any portion of such an

area from the critical habitat "if the benefits of such exclusion outweigh the benefits of specifying the area as part of critical habitat." Id. However, the Secretary "shall not exclude any such area if, based on the best scientific and commercial available, he determines that the failure to designate that area will result in the extinction of the species concerned." Id.

A final regulation designating critical habitat shall be published concurrently with the final regulation implementing the determination that the species is endangered or threatened, unless the Secretary deems that it is essential to the conservation of the species that the regulation implementing such determination be promptly published, or critical habitat is not then determinable, in which case the Secretary may extend the one-year period by not more than one additional year, but not later than the close of such additional year, the Secretary must publish a final regulation, based on such data as may be available at that time, designating, to the maximum extent prudent, such habitat. 16 U.S.C. § 1533 (b)(6)(C).

Regulations implementing section 4 provide additional procedural considerations. Critical habitat shall be specified to the maximum extent prudent and determinable at the time a species is proposed for listing. 50 C.F.R. § 412.12. A designation of critical habitat is not prudent when one or both of the following situations exist: the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to such species, or the designation of critical habitat would not be beneficial to the species. Id. at § 412.12(a)(1). Critical habitat is not determinable when one or both of the following situations exist: information sufficient to perform required analyses of the impacts of the designation is lacking, or the biological needs of the species

are not sufficiently well known to permit identification of an area as critical habitat. Id. at § 412.12(a)(2).

In determining what areas are critical habitat, the Secretary "shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection." 50 C.F.R. § 412.12(b). Such requirements include, but are not limited to: space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. Id.

When considering the designation of critical habitat, the Secretary shall focus on the principal biological or physical constituent elements within the defined area that are essential to the conservation of the species. Id. Known constituent elements shall be listed with the critical habitat description. Id. Primary constituent elements may include, but are not limited to, roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dry land, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types. Id.

The ESA also provides a process to revise an existing critical habitat designation. To the maximum extent practicable, within 90 days after receiving the petition of an interested person under section 553(e) of Title 5 to revise a critical habitat designation, the Secretary shall make a finding as to whether the petition presents substantial scientific information indicating that the revision may be warranted. 16 U.S.C. § 1533(b)(3)(D)(i). The Secretary

shall promptly publish such finding in the Federal Register. Id. Within 12 months after receiving a petition that is found to present substantial information indicating that the requested revision may be warranted, the Secretary shall determine how he intends to proceed with the requested revision, and shall promptly publish notice of such intention in the Federal Register. 16 U.S.C. § 1533(b)(3)(D)(ii).

In making the finding whether the petition presents substantial scientific information indicating that the revision may be warranted, the Secretary shall consider whether the petition contains information indicating that the areas petitioned to be added to critical habitat contain physical and biological features essential to, and that may require special management to provide for, the conservation of the species. 50 C.F.R § 424.14(c)(2)(i). The Secretary also shall consider whether the petition contains information indicating that the areas designated as critical habitat do not contain resources essential to, or do not require special management to provide for, the conservation of the species. 50 C.F.R § 424.14(c)(2)(ii).

C. SUBSTANTIVE PROTECTIONS PROVIDED BY LISTING

Once a species is listed, the ESA contains several different substantive protections for listed species. Section 4(f) of the ESA requires that the Secretary prepare a "Recovery Plan" for the species, unless he finds that such a plan will not promote the conservation of the species. 16 U.S.C. § 1533(f). In developing and implementing such a plan, the Secretary shall, to the maximum extent practicable, incorporate in each plan "a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species." 16 U.S.C. § 1533(f)(1)(B)(i). This requirement is

particularly relevant in the context of the sparrow. As discussed below, the Service has explicitly called for the revision of the sparrow's critical habitat in the recently revised sparrow Recovery Plan. See MSRP at 4-352.

Under section 7 of the ESA, each federal agency "shall... insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary... to be critical...." Id. at § 1536(a)(2). "Destruction or adverse modification" is defined by a regulation as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical." 50 C.F.R. § 402.02. As discussed below, subpopulation A, which is crucial to the sparrow's continued existence and recovery, has not received the substantive protections provided by critical habitat. As a result, this population has precipitously declined, and placed the sparrow at a high risk of extinction.

D. ADMINISTRATIVE PROCEDURE ACT

The Administrative Procedure Act requires each federal agency to "give an interested person the right to petition for the issuance, amendment, or repeal of a rule." 5 U.S.C. 553(e).

IV. BACKGROUND AND STATUS OF THE CAPE SABLE SEASIDE SPARROW

This section of the petition reviews the background and status of the sparrow.

Subsections discuss the sparrow's distinguishing characteristics, systematics, distribution, habitat use, behavior, and demography.

A. DISTINGUISHING CHARACTERISTICS

On a trip to Cape Sable, Florida in 1918, Arthur H. Howell discovered the sparrow.

Arthur H. Howell. Description of a New Seaside Sparrow from Florida, The Auk 36: 86-87

(1919)(hereinafter "Howell 1919"). Howell described the type as follows:

Pileum mouse gray, streaked (chiefly in two lateral stripes) with chaetura black, washed on occiput with yellowish olive; hind neck pale yellowish olive, this color forming a rather conspicuous, broad, transverse band; interscapular region and rump olive (slightly paler than deep olive of Ridgway), streaked with fuscous, the scapulars broadly edged with white; upper tail coverts olive, with a broad median streak of fuscous and tipped with pale grayish; rectrices fuscous along vanes, mouse gray on inner webs, indistinctly barred with fuscous; outer webs citrine drab; tips margined with white. Supraloral region empire yellow; superciliary stripe pyrite yellow, bordered above with grayish and shading posteriorly to cream buff; lores, suborbital region, and auriculars neutral gray, mixed with whitish; postocular streak and short streaks on side of neck chaetura black; submalar stripe buffy white, bordered above and below with chaetura black. Primaries and secondaries fuscous, edged with olive; tertials dark fuscous, margined with buffy white; edge of wing empire yellow; lesser coverts pyrite yellow; middle coverts fuscous-black, edged with grayish olive; greater coverts fuscous, shaded with olive, and bordered on web with cinnamon, the terminal portion darker and margined with buffy white; under-parts white, heavily streaked on chest, sides, and flanks with dark fuscous, the same areas faintly washed with cinnamon; under tail coverts white, tinged with cinnamon and streaked with fuscous; thighs drab; lining of wings dull white, mottled with hair brown; upper mandible blackish, lower mandible dark mouse gray.

Id. at 86-87. A more recent description of the sparrow states that it has an "olive-gray back,"

and the "dorsal side of the tail and wings is olive-brown. The breast and sides are light gray

with dark olive-gray streaks, and the belly is unstreaked. The legs, ear patch, and bill are gray. The head is accented by yellow lores and white lines extending along the jaw above the dark olive-gray to black whisker stripes." Curnutt, J.L. Cape Sable Seaside-sparrow, in Rare and endangered Biota of Florida. Birds 137-143, 137-138. (James A. Rogers, Jr. et al. eds., 1996)(citations omitted). The sexes are similar. Id.

The sparrow is "medium sized;" id. at 137; Howell listed the measurements as follows: "Type (adult male): wing, 57; tail, 51; exposed culmen, 12; depth of bill at base, 6.5; tarsus, 22; middle toe, 17. Average of five adult males: Wing, 58.2 (57-60), tail, 51.4 (50-53); exposed culmen, 12.1 (12-12.5); depth of bill at base, 6.6 (6.5-7), tarsus, 21.9 (21.5-22); middle toe, 16.8 (16-17). One adult female: 53; 47.5; 12.5; 7; 22; 16." Howell 1919 at 87. Werner provided more detailed measurements of the sparrow based on his study in the early 1970s. Werner, The Biology of the Cape Sable Sparrow (1975)(unpublished manuscript on file with the BLF)("Werner 1975") (Exhibit 3).

B. SYSTEMATICS

When the Cape Sable seaside sparrow was discovered, Howell noted that it "differs so strikingly from all other Seaside sparrows that intergradation with any of the forms seems very improbable," and he assigned it full species status under the name *Thryospiza mirabilis*. Howell 1919 at 86, 87. For several decades thereafter, the sparrow was considered to be the last "full species" to be discovered in North America. Oliver L. Austin, Jr. The Seaside Sparrow Assemblage: A Review of its History and Biology, in The Seaside Sparrow, its biology and management 55-75 (Thomas L. Quay et al. eds. 1983).

In 1944, Griscom published his review of the seaside sparrow. Ludlow Griscom, A Second Revision of the Seaside Sparrows, in 19 Occas. Pap. Mus. Zool. Louisiana State Univ. 313 (1944). Based on an extensive review of specimens, Griscom argued that the Cape Sable seaside sparrow “has no real claims to specific distinctness.” Id. at 325. Rather, he concluded that the sparrow is “a small, local population in an extreme development of the light phase.” Id.

Despite Griscom’s recommendations, the American Ornithologists Union continued to maintain the sparrow as a full species in its fifth edition of the checklist. American Ornithologist’s Union, A Checklist of the Birds of North America (5th edition 1957).

When the Service listed the sparrow in 1967 pursuant to the Endangered Species Preservation Act of 1966, see 32 Fed.Reg. 4001 (March 11, 1967), the Service listed the scientific name as *Ammodramus* (= *Ammospiza*) *maritimus mirabilis*.

The Thirty Second Supplement to the 1957 Check-List revised the sparrow’s classification in 1973 and relegated it to subspecific status. *A. mirabilis* was henceforth to be considered a subspecies of *A. maritima*, becoming *A. m. mirabilis*. American Ornithological Union, Thirty-Second Supplement to the American Ornithologist’s Union Check-List of North American Birds 90 Auk 418 (1973).

In the American Ornithological Union’s (“AOU”) 1982 Supplement, the scientific name *Ammospiza maritima* was changed to *Ammodramus maritimus*. This classification has been maintained. See American Ornithological Union, Check-List of North American Birds, 7th edition (1998).

In 1998, McDonald completed her review of seaside sparrow taxonomy, which included an examination of 1318 skins. Mary Victoria McDonald, Status Survey of Two Florida Seaside Sparrows and Taxonomic Review of the Seaside Sparrow Assemblage (1988)(unpublished manuscript on file with the BLF)(“McDonald 1988”). She found that three subspecies (*A. m. mirabilis*, *A. m. nigrescens*, and *A. m. sennetti*) are distinctly smaller than the other six subspecies, with the Cape Sable seaside sparrow being the smallest overall, *id.* at 18, and thus “seem[s] to be validly characterized as distinct subspecies based on size as well as plumage.” *Id.* at 19. Likewise, the songs of *A. m. nigrescens* and *A. m. mirabilis* “are distinctive aurally and sonographically, and can be used as good characteristics to separate out these forms from the other subspecies,” but the songs of the remaining subspecies do not appear to possess consistent, distinctive characters. *Id.* at 25. As to plumage characteristics, the *nigrescens* and *mirabilis* races “were the most distinctive and could always immediately be distinguished from all other subspecies, with one exception. That is, when considering only the back sides of the birds, the dorsum of *mirabilis* was remarkably similar to the dorsum of *sennetti*.” *Id.* at 36. However, despite the differences in size, song, and plumage, she proposed that “all of the Atlantic coast subspecies be merged into one, which would be called *maritimus*.” *Id.* at 40. While this conclusion perhaps is based on molecular genetics work by John C. Avise – which concluded that there were two major evolutionary splits, the Atlantic and Gulf Coast Groups – that was briefly discussed in McDonald’s paper, it is important to note that as of the time of McDonald’s paper, Avise had not been able to secure permission from the Service to collect Cape Sable seaside sparrows to include in the genetics analysis. *Id.* at 31. Thus, despite McDonald’s

recommendation, it was not clear whether the sparrow genetically fit into the Atlantic group, the Gulf group, or a separate category.

As noted above, while the AOU currently considers the sparrow to be a distinct subspecies of the seaside sparrow, the species or subspecies issue has yet to be fully resolved. Recently, a panel of ornithologists of the AOU reviewed the status of the sparrow and issued a "draft" report. Jeffrey R. Walters et al., Draft Cape Sable Review Panel Review (1999)("1999 Review Panel")(unpublished manuscript on file with the BLF)(Exhibit 4). The Panel first noted that "[e]cologically, the Cape Sable Seaside Sparrow joins the Dusky Seaside Sparrow as the only Seaside Sparrows known to have populations in freshwater wetlands." *Id.* at 2-3. They reviewed the work of McDonald 1988 and Jerome D. Robins & Gary D. Schnell, Skeletal Analysis of the Ammodramus-Ammodramus Grassland Sparrow Complex: a Numerical Taxonomic Study 88 Auk 567 (1971), and noted that the work "suggests basic difference in 'shape' as well as size." *Id.* at 3. Yet, they also noted that "[a]s of this writing, there remains no definitive analysis of the relationship of Cape Sable Seaside Sparrows to other Seaside Sparrows based on molecular genetics (Avisé and Nelson 1989, Avisé pers. comm.)." *Id.* They concluded that "although the genetic distinctiveness of the Cape Sable Seaside Sparrow remains unclear, morphological, behavioral, and ecological grounds exist for arguing that this is a unique subspecies that qualifies for protection under the ESA." *Id.* at 4.

C. HABITAT

While there have been several studies of sparrow habitat since the 1970s, significant additional information become available this decade. The preferred nesting habitat of Cape

Sable seaside sparrows is the short-hydroperiod mixed marl prairie communities. As discussed below, while sparrows have been located in several plant communities found within the marl prairie, research documents that muhly grass (*Muhlenbergia filipes*) supports the highest densities of sparrows. In contrast, sparrows tend to avoid tall, dense, sawgrass communities, coastal spike rush (*Eleocharis*) marshes, extensive cattail (*Typha*) monocultures, long-hydroperiod wetlands with tall, dense vegetation cover, and sites supporting woody vegetation.

Werner conducted surveys of sparrow distribution and habitat between 1970 and 1975. Werner 1975. Based on these surveys, Werner and Woolfenden divide sparrow habitat into four types of habitat: clumped *Spartina* prairies, unclumped *Spartina* prairies, sparse *Cladium* prairies, and *Muhlenbergia* prairies. Harold W. Werner & Glen E. Woolfenden, The Cape Sable Sparrow: Its Habitat, Habits and History, in The Seaside Sparrow, Its Biology and Management 57 (Thomas L. Quay et al. eds. 1983) ("Werner and Woolfenden 1983")(Exhibit 5). The clumped *Spartina* prairies are:

dominated by tall, generally clumped *Spartina bakeri*, a grass with a mean height of approximately 2 m. The *Spartina* cover is broken into a discontinuous pattern over most of the colony by creeks, ponds, and patches of shorter vegetation (*Distichlis spicata*, *Eleocharis cellulosa*, *Sesuvium sp.*, and a few small *Laguncularia racemosa*). This interior prairie overlying loose organic soil is covered by shallow, slightly brackish water during most of the year. Some years this habitat appears to be flooded continually.

Id. at 57-58. Werner and Woolfenden conclude that *Spartina* prairies were formerly more extensive on Cape Sable. Id. at 58. "Photographs taken along the Homestead Canal west of Gator Lake in 1924 show vast prairies of *Spartina bakeri* dotted with occasional palm hammocks. Today this area is primarily mangroves, mud flats, and halophytic forbs." Id.

The unclumped *Spartina* prairie is:

dominated by *Spartina bakeri*, but here it grows low (about 1 m) with an irregular distribution, instead of tall and clumped. In some places, where the habitat has not burned for several years, the *Spartina* has fallen over, forming dense mats pierced by new upright growth. The shallow soil (approximately 0.5m deep) varies from gray to brown and is composed of marl, detritus, and quartz sand. The prairie is generally flooded except during the spring dry season.

The prairie is dissected by stands of *Eleocharis cellulosa*, Cat-tails (*Typha* sp.), Pond Cypress (*Taxodium ascendens*), and Bald Cypress (*T. distichum*). The *Spartina* prairie is dotted with small Cabbage Palm (*Sabal palmetto*) hammocks, and scattered patches of *Distichlis spicata* and *Juncus roemerianus*. Adjacent to Big Cypress Swamp the species diversity increased in the unclumped *Spartina* prairie as the grass mixed with *Cladium jamaicense*, *Panicum virgatum*, and other graminoids.

Id. at 58. Werner and Woolfenden note that between 1970 and 1975, vast changes occurred in the Ochopee-Turner River region. At Ochopee, much of the *Spartina* was replaced by *Juncus*, and the *Eleocharis* was replaced almost entirely by *Distichlis*. A large patch of *Typha* in the center of the site had almost disappeared. Near the Turner River vast stands of *Typha* have been replaced by *Spartina*. The region appears to have become more saline during these years." Id.

The third habitat type is sparse *Cladium* prairie. This consists of "short (about 1 m), sparse Sawgrass, *Cladium jamaicense*, growing on shallow (about 0.5m) gray marl soil, which is flooded most of the year, and includes widely spaced tree islands. Both floristically and structurally the region appears homogeneous." Id. at 60.

The fourth habitat type is the *Muhlenbergia* prairie. These prairies:

resemble sparse *Cladium* prairies in that they are vast, homogeneous expanses of short grass dotted with tree islands. Closer examination reveals generally clumped, short grass (about 0.7 m high) having involute, pointed leaves and growing on shallow gray-marl soil (about 0.2 m deep), which is flooded with fresh water for only a few months (mean = 80 days, range 0-

177 days, Taylor Slough study site, N = 14 years) during the summer and fall. *Muhlenbergia* prairie is dotted with small solution holes averaging about 1 to 4 m in diameter and about 0.25 to 0.5 m deep, which are filled with marl, organic soil, or both. Principal solution-hole plants include tall dense *Cladium*, forbs, and other graminoid vegetation typical of the deeper part of the slough (e.g. *Sagittaria lancifolia*, *Panicum hemitomon*); occasionally woody plants (especially *Salix caroliniana*) are present. In some areas the limestone bedrock, Miami Oolite, protrudes as pinnacle rock, and the vegetation is sparse. The sparrows avoid these rocky areas. Floristically, *Muhlenbergia* prairies are the most heterogeneous habitat used by Cape Sable Sparrows. Other plants common in this habitat include *Schizachyrium rhizomatum*, *Centella asiatica*, *Phyla nodiflora*, *Pluchea rosea*, *Rhynchospora microcarpa*, *Melanthera angustifolia*, and over 100 species, principally forbs and graminoid vegetation. The sparrows seem to avoid those places where considerable brush has invaded the prairie. At Taylor Slough the maximum forb height was significantly greater ($P < 0.01$) in unoccupied prairie. The general resemblance of large forbs to wood plants (brush) further substantiates the apparent avoidance by Cape Sable Sparrows of brushy prairie.

Id.

Werner and Woolfenden note that the extent of the prairie at Taylor Slough, both *Muhlenbergia* and *Cladium*, is decreasing because of the spread of exotic trees (*Casuarina litorea*, *C. glauca*, *Melaleuca quinquenervia*, and *Schinus terebinthifolius*). Much of the prairie near Grossman Hammock and southeast of Homestead also once may have been acceptable habitat for sparrows. However, they noted the areas had been invaded in "recent years" by exotics, principally *C. litorea*. *Schinus* and *Melaleuca* also are invading these areas. They conclude that the rate of spread of these exotics "seems sufficiently rapid to change a prairie to forest within several years, which of course eliminates the sparrows." Id.

Kushlan and Bass, during their 1981 census, also determined the characteristics of sparrow habitat. James A. Kushlan & Oron L. Bass, Jr. Habitat Use and the Distribution of the Cape Sable Sparrow, in The Seaside Sparrow, Its Biology and Management (Thomas L.

Quay et al. eds. 1983)(“Kushlan and Bass 1983”)(Exhibit 6). Kushlan and Bass characterized each habitat according to its dominant plant cover, id. at 140, specifically, Muhly prairie, mixed prairie, Cordgrass marsh, Sawgrass marsh, Cat-tail marsh, and Black Needlerush marsh, mangrove swamp forest, cypress swamp forest, pine forest, and hammock forest.¹ “In nearly all cases,” they found sparrows only in the first three listed plant communities. Id.

They described Muhly prairie as follows:

Muhly prairie is a mixture of grasses, sedges, and forbs in which graminoids predominate. This community occurs on marl soil and has a short (1 to 6 months) hydroperiod. Muhly (*Muhlenbergia filipes*), a bunchgrass, dominates plant community structure in frequency and cover. In some areas Black-top Sedge (*Schoenus nigricans*) is the dominant clumped species, and Muhly is secondary. The bunchgrasses are 60 to 90 cm high. Sawgrass (*Cladium jamaicense*) is a constant associate and is usually 20 to 30 cm taller than Muhly or Black-top Sedge. *Schizachyrium rhizomatum* and *Rhynchospora* sp. also occur. Overall, the community may contain up to 20 species of graminoids and 50 species of forbs. Graminoids make up 98% of plant cover, which varies with hydroperiod, soil depth, and fire history. Large areas of Muhly prairie have sparse, 10 to 25%, cover.

Id.

“Except for lacking Muhly, mixed prairie is similar in composition to the Muhly prairie. The absence of Muhly changes the structure of the community by eliminating the grassy clumps. A greater mixture of species includes *Rhynchospora* sp. and grasses, especially *Panicum virgatum*. Sawgrass is always present.” Id.

¹ The Cordgrass classification, they noted, combined Werner and Woolfenden’s two cordgrass habitats, and the mixed prairie is equivalent to the Werner and Woolfenden’s sparse Sawgrass community. Id. at 140.

The remaining communities are dominated by their indicator species. Cordgrass marsh is composed primarily of *Spartina bakeri*. Sawgrass marsh has “a longer hydroperiod than the prairie communities and occupies the central, deeper-water cores of the southern Everglades, Shark River Slough, and Taylor Slough.” *Id.* Cat-tail marsh is dominated by *Typha* sp., up to 3 m tall. Black Needlerush marsh, dominated by *Juncus Roemerianus*, occurs within and near the coastal mangrove swamps in inland, non-tidal situations. *Id.*

As to habitat use by sparrows, Kushlan and Bass concluded that “[m]ost birds occurred in habitat dominated by the grass, *Muhlenbergia*, and 67% of the occupied habitat was Muhly prairie. Muhly and the similarly mixed prairie accounted for 96% of the habitat occupied by sparrows.” *Id.* at 143. They also found sparrows at 8 of 61 sites dominated by cordgrass and at two plots that contained cypress trees. *Id.* They found that sparrows do not use “habitat containing trees or brush,” so the “extensive mangrove, pine, and cypress forests of southern Florida are unsuitable as habitat.” *Id.* at 139.

Dean and Morrison also have evaluated habitat usage by the sparrow. Tylan F. Dean & Joan L. Morrison, Non-Breeding Season Ecology of the Cape Sable Seaside Sparrow (*Ammodramus maritimus mirabilis*), 1997-1998 Field Season Report (1999)(unpublished manuscript on file with the BLF)(Dean and Morrison 1999)(Exhibit 7). They sampled various habitat variables, including water depth and six dominant vegetation variables – muhly, sawgrass, rush, litter, bare ground, and shrub. *Id.* at 11. At their study sites – within subpopulation B – muhly and sawgrass (*Cladium jamaicense*) were the “dominant” plant species, and there were “scattered” tree islands and cypress domes. *Id.* at 5. “Rush” was composed of several structurally similar categories: black-topped sedge (*Schoenus*

nigricans), beak rushes (*Rhynchospora katespii* and *R. inundata*), and spike rush (*Eleocharus sp.*). *Id.* at 11-12. The litter category included litter of all species. *Id.* at 12. In the review of micro-habitat characteristics, Dean and Morrison noted that vegetation of the muhly prairies is composed primarily of four major components: muhly, sawgrass, “rushes,” and graminoid litter; shrubs and trees, including wax myrtle (*Myrica cerifera*), a variety of subtropical woody species, a variety of forbs, and emergent aquatic vegetation (primarily duck potato – *Sagittaria falcata*) represented minor components of the vegetation. *Id.* at 27. The cover of live (green) muhly stems was less than 50% in more than 99% of all points, and live sawgrass cover was less than 50% in more than 96% of all points; cover of graminoid litter generally ranged from 5 – 75%, and rush cover rarely exceeded 25%. *Id.* Bare ground cover generally ranged from 5 – 75%. *Id.* at 27-28.

They found that “[i]n accordance with other studies, we affirmed that sparrows seem to be primarily dependent on the open expanses of muhly- and sawgrass-dominated habitats where they currently reside.” *Id.* at 26. However, they noted that there were “landscape features” that were worthy of mention. They “regularly observed” sparrows “within small tree islands, especially in the fall during the period when sparrows were molting. Sparrows did not seem to avoid areas containing a few isolated trees or bushes, and occasionally perched in them. However, sparrows generally did not perch high in trees or bushes and rarely used or perched in very large tree islands, though they occasionally approached them and used dense sawgrass stands around the edges of the large tree islands.” *Id.* The sparrows “rarely approached the linear forest features” and Dean and Morrison “rarely recorded a

sparrow within approximately 100 m of a road, despite the absence of any other apparent differences in the habitat nearer the road.” Id.

When reviewing the association of water depth and habitat use, Dean and Morrison found that at sparrow locations, cover of muhly and rush were inversely related to water depth, while sawgrass cover and vegetation height variables were positively associated with water depth. Id. at 31. They observed that during wet periods, sparrows are unable to walk on the ground or flit among the bases of grass clumps as they frequently do in areas of high muhly cover; sawgrass provides greater height and more complex structure at a level sufficiently above the water for the sparrows to use during periods of high water. Id. They noted that “[w]ithin the overall muhly prairie habitat, a sparrow’s selection of a territory or home range may depend less on the presence of one particular habitat characteristic and more on a variety of habitat and structural characteristics.” Id. at 31-32 (emphasis added).

A group of scientists has been working with Dr. Stuart Pimm over the last seven years to review the status of the sparrow in the Everglades. One recent paper by Nott and others reviews the relationship between changes in vegetation in sparrow habitat and water levels. M. Philip Nott et al., Water Levels, Rapid Vegetational Changes, and the Endangered Cape Sable Seaside-sparrow 1 Animal Conservation 23 (1998)(“Nott et al. 1998”)(Exhibit 8). They note that marl prairies, which flank the eastern and western edge of Shark River Slough, are “flooded for 3-7 months each year” and “are the preferred habitat of the sparrow. Id. at 23. Based on extensive surveys, they concluded that the sparrow “is found almost exclusively in marl prairies. These prairies are either dominated by muhly grass (*Muhlenbergia filipes*), or are mixed prairies with no dominant grass species. Mixed prairies

are often diverse and include muhly, sawgrass (*Cladium jamaicense*), and black-top sedge (*Schoenus nigricans*). The sparrow avoids prairies dominated by sawgrass and spikerush (*Eleocharis* spp.), which have longer hydroperiods.” *Id.* at 29. Nott et al. compared the vegetation of Taylor Slough between the year 1975, when Werner reviewed its composition, and 1995-96. Their results are noted in Table 1 below:

Table 1: Muhly and Sawgrass Cover, 1975 and 1995/1996

Parameter	1975	1995/1996
Square meters sampled (<i>n</i>)	50	16
Mean no. of species/square meter	9.9	4.1
Muhly dominance by % cover	82%	21%
Sawgrass dominance by % cover	14%	77%

Id. In the 21 years between the two surveys, the dominance of muhly and sawgrass has switched, they noted, and they observed also that their conclusions were consistent with a detailed vegetation study of Taylor Slough. T. V. Armentano et al., Effects of Hurricane Andrew on Coastal and Interior Forests of Southern Florida: Overview and Synthesis 21 Journal Coastal Research 111 (1995). This change, they concluded, was due to a lengthening of the hydroperiod. Nott et al. 1998 at 30.

Nott et al. also reviewed vegetation composition west of Shark River Slough in 1992 and 1996, with habitat being classified as either “dry,” being the mixed and muhly dominated prairies with short hydroperiods, or “wet,” being the sawgrass dominated vegetation with long hydroperiods. Between 1992 and 1996 (with 1996 being a wet year), some 103 sites changed from dry to wet, while only 39 changed from wet to dry; 77

remained dry and 39 remained wet ($x^2=5$, $P<0.05$). Id. at 31. They proposed that increased production and changes in periphyton associated with higher water levels can result in mats of periphyton that flatten and kill the above ground portion of *Muhlenbergia*, while sawgrass can penetrate the mat. Id.

Lockwood et al. also reviewed the habitat characteristics of sparrows based on the study of nests at subpopulations A, B, and E. Julie L. Lockwood et al., Defining nest-site microhabitats and preferences to aid in the recovery of the Cape Sable seaside-sparrow (*Ammodramus maritimus mirabilis*)(in press)(Exhibit 9). Typically, from 7 to 10 plant species were identified per nest-site quadrant; only four species were dominant (i.e., consistently ranked highest in cover class): muhly grass, sawgrass, *Rhynchospora* spp. (*tracyi* or *microcarpa*), and *Schizachyrium rhizomatum*. Id. at 6. Subpopulation B most closely resembled what Werner 1975 refers to as a muhly grass dominated prairie; subpopulation E also was a muhly prairie, although with less muhly grass than B; subpopulation A contained no muhly grass and is similar to what Werner 1975 referred to as sparse sawgrass prairies. Id. The nest site microhabitats were unique from a set of random points, with maximum vegetation height (ANOVA $F=14.91$, $df=2$, $P<0.0001$) and effective cover height (ANOVA $F=29.25$, $df=2$, $P<0.0001$) being higher within the nest site quadrant; the degree of vegetative clumping is higher within the nest site quadrant as well. Id. at 9. Sawgrass and dead vegetation covered significantly more area within the nest site quadrants; the modal percent cover of sawgrass within a nest site quadrant was 25 to 50% and for dead vegetation cover was 50 to 75%. Id. Lockwood et al. concluded that sparrows selectively place nests within sites providing sufficient ground-level cover and where the tallest perches

are available. Id. at 11. While sparrows may prefer nest sites with sawgrass that is 1 to 1.5 m in height, they avoid using habitats where the sawgrass is even a few meters higher. These habitats are typically densely packed with sawgrass and are flooded year around; this prevents adult sparrows from foraging, entering the nest, and placing nests at appropriate heights of the ground. Id.

Balent et al. also have reviewed sparrow habitat during the non-breeding season, which they referred to as the "wet season," and defined as July 1, 1996 until February 15, 1997. Karla L. Balent et al., Wet Season Ecology of the Cape Sable Seaside Sparrow (in press)("Balent in press")(Exhibit 10). While they searched marl prairie (which they described as being "dominated by *Mulenbergia filipes* interspersed with sawgrass (*Caladium jamaicensus*) stands and small tree islands"), coastal prairie, mixed prairie, dry prairie, pineland, dwarf cypress and mangrove habitat types, they found no sparrows in habitat other than marl prairie. However, Balent et al. did note that the sparrows show a change in microhabitat use within the prairies: the majority of detections throughout the wet season are of birds in sawgrass sways and sawgrass sways with small trees (80%), in contrast to the breeding season, when the sparrows spend their time in the open prairie. They suggested that these habitats likely provide cover and refuge during molt, and perhaps an increased food supply during the wet season. Also, sawgrass strands may provide an escape, in the form of higher perches, from rising surface waters. There was a decrease in observations of sparrows throughout October, November, and December, and a subsequent increase in numbers and activity by mid-February, when the male birds were competing for territories

for the upcoming breeding season and readily observed singing from perches within open marl prairie.

The AOU Panel that reviewed the status of the sparrow reached conclusions that are similar to the breeding season research that is summarized above. They noted that the sparrow is "entirely restricted to marl prairies." 1999 Review Panel at 8. These prairies have a hydroperiod of 4 to 8 months; when hydroperiods are longer, taller marsh grasses predominate and where hydroperiods are shorter, prairie can only persist when fire eliminates woody plants. Id. at 9. It was "clear to the Panel, both from the literature and on site visit, that relatively small changes in hydrology, especially water depth and hydroperiod, lead to critical changes in habitat quality... Cape Sable Seaside Sparrows place their nests just above the bases of clumps of wet-prairie vegetation (most often, now at least, in tussocks of muhly grass *Muhlenbergia filipes* – Werner 1975)." Id. at 22. They note:

There is good evidence that extended hydroperiods result in changes in vegetation that reduce habitat suitability for Cape Sable Seaside Sparrows, specifically conversion from muhly-dominated to sawgrass-dominated prairie or marsh (Kushlan et al. 1982, Armentano et al. 1995, Nott et al. 1998).

In some ways, effects of extended hydroperiod on vegetation are more important than effects on reproduction. That sawgrass-dominated prairie is unsuitable habitat for sparrows is evident from Nott's (1998) work on habitat use as a function of vegetative composition generally, as well as information about Populations A and D specifically (Nott et al. 1998). Because the habitat can recover with a return to shorter hydroperiods (Nott 1998), it is chronic alteration of hydroperiod rather than occasional flood events that are problematic. If water management produces long hydroperiods in Area A frequently enough to alter vegetation, as has occurred in Area D, then survival and reproductive rates will be moot. There will not be habitat to support successful reproduction regardless of how many birds might be in the area.

Id. at 26-27.

From the research reviewed above, there is a consensus in the scientific community regarding the habitats that sparrows do not use and the habitats that sparrows utilize. The best available scientific data indicate that sparrows do not utilize sites that support extensive amounts of woody vegetation – such as exotics, pinelands, or cypress – and that sparrows avoid tall, dense, sawgrass communities, coastal spike rush (*Eleocharis*) marshes, extensive cattail (*Typha*) monocultures, and long-hydroperiod wetlands with tall, dense vegetation cover. The best available data also shows that sparrows now are known only from marl prairie communities. The composition of vegetation in this habitat type can vary somewhat, with Muhlenbergia being predominant in certain areas, and sparse, short sawgrass or a “mixed prairie” composition being predominant in other areas. It is these prairies – with the short hydroperiod that helps maintain the necessary vegetation composition and structure – that must be preserved and restored if the sparrow is to recover. However, as discussed below, the Corps’ and District’s management of the hydrology of southern Florida has altered the timing, distribution, and amounts of water flows in a manner that has adversely affected the marl prairie communities and jeopardized the continued existence of the sparrow.

D. DISTRIBUTION

When Howell discovered the sparrow in 1918, “he considered its presence something of a miracle and named the bird *mirabilis*.” Louis A. Stimson, Cape Sable Sparrow, in Life Histories of North American Cardinals, Grosbeaks, Buntings, Towhees, Finches, Sparrows, and Allies 859 (Oliver L. Austin, Jr. ed. 1968). “Discoveries, apparent losses, and rediscoveries of sparrow populations in various areas has characterized its

known history.” Kushlan and Bass 1983 at 139. This section of the petition reviews the historical and current distribution of the sparrow subpopulations.

Howell noted, in announcing his discovery of the sparrow, that its range was “unknown,” but “probably it is confined to the coastal marshes in the vicinity of Cape Sable....” Howell 1919 at 87. The sparrow “appeared to be only moderately numerous in the area traversed.” Id. at 87. Eight years later, Nicholson noted that the population at Cape Sable “is extremely local in distribution, with a total range of about nine miles long and a mile wide....” Nicholson, Nesting Habits of the Seaside Sparrows in Florida. The Wilson Bulletin 40: 235 (1928). He further noted that “the number of birds seen was far less than the birds found in the colonies of Macgillivray’s and Dusky Seasides.” Id. at 236.

On September 2, 1935, one of the most powerful hurricanes on record in the Western Hemisphere struck the Florida Keys. Jay Barnes, Florida’s Hurricane History (rev. ed. 1998). After exiting the Keys, the storm passed almost directly over Cape Sable. Id. at 144 (map showing direction of storm). While Semple stated that he saw the sparrow on Cape Sable in April of 1936, JohnB. Semple, The Cape Sable Sparrow and Hurricanes 53 Auk 341 (1936), many others unsuccessfully searched and concluded that the storm destroyed all sparrows on the Cape. Stimson, for example, noted that since the 1935 hurricane, sparrows were not reported during the period of May 15 to August 1, when no other species of sparrow would be present. Louis A. Stimson, The Cape Sable Seaside Sparrow: its Former and Present Distribution 73 Auk 492 (1956)(“Stimson 1956”)(Exhibit 11); see also, Alexander Sprunt, Jr., Florida Bird Life 479 (1956)(“Sprunt 1956”); Thos. D.

Burleigh, Notes on a Recent Field Trip to Southern Florida 12 The Florida Naturalist 95 (1939).

Thirty five years after their presumed destruction from the hurricane, Werner rediscovered sparrows on Cape Sable in June of 1970. Harold H. Werner, Cape Sable Sparrows Rediscovered on Cape Sable 88 Auk 432 (1970). However, between then and 1976, "only a few to none were found there." Werner and Woolfenden 1983 at 58. In 1978, Kushlan and Bass found sparrows at two sites on Cape Sable where Werner had last found birds. Kushlan and Bass 1983 at 142. However, in 1979 and 1980, Kushlan and Bass were unable to find birds in their previous locations on Cape Sable. Id. The Service noted that fires on Cape Sable may have extirpated the sparrow. Service, Cape Sable Seaside Sparrow Recovery Plan (1983). Likewise, habitat changes, perhaps initiated or hastened by the 1935 hurricane, have been identified as a causative factor in the sparrow's disappearance, as other vegetation has replaced the vast strands of *Spartina*. Werner and Woolfenden 1983 at 59; see also Werner 1975 at 38. The BLF understands that recent surveys have not located sparrows on Cape Sable.

While it was initially thought that the sparrow was restricted to Cape Sable, Nicholson discovered another population in 1928 six miles southwest of the village of Pinecrest in Collier County. While Nicholson originally described the location as "northwest" from the village, Donald J. Nicholson, Nesting Habits of Seaside Sparrows in Florida 40 Wilson Bulletin 234 (1928), he later corrected his error in describing the location. See Stimson 1956 at 489; see also Sprunt 1956 at 479 (noting that population was southwest of Pinecrest). While Stimson and others found sparrows at several locations in the Big

Cypress Swamp during the 1950s, see Stimson 1956, a period of extensive fires during the breeding season was thought to have caused their widespread decline there. Werner and Woolfenden 1983 at 63. During their census in 1981, Kushlan and Bass found birds at 12 of 21 sites in their survey of the Big Cypress Swamp. Kushlan and Bass 1983 at 142. Birds in this area are considered rare. Service, Final Biological Opinion for the U.S. Army Corps of Engineers, Modified Water Deliveries to Everglades National Park, Experimental Water Deliveries Program, and Canal 111 Project 22 (1999)("1999 BO")(Exhibit 12).

Further northwest from this area, Anderson found sparrows in coastal marshes near Ochopee in June of 1942. Wm. Anderson, Rediscovery of Cape Sable Seaside Sparrow in Collier County 16 Florida Naturalist 12 (1942). The location was later identified as being close to the corner of the Tamiami Trail and the road running north to La Belle from Everglades City (SR-29). Stimson 1956 at 493. In the late 1950s, fires swept through the sparrow habitat in the vicinity of Ochopee; Stimson unsuccessfully searched, as he was concerned that fires had extirpated the sparrows. Louis A. Stimson, Cape Sable Sparrows- Fire and Range Expansion 34 Florida Naturalist 139 (1961)(Stimson 1961)(Exhibit 13). In 1978, Kushlan and Bass found sparrows at one site near Ochopee. Kushlan and Bass 1983. However, in 1980, they were unable to find birds near Ochopee. Id. Pimm et al. located a small number of sparrows there in 1993, but they were not found there in 1994 (although the area may not have been adequately surveyed due to logistical problems). 1999 BO at 22. The decline of sparrows in this area has been attributed to fires and salinity changes associated with altered hydrology. Id. The BLF understands that recent surveys have not located sparrows in the Ochopee area.

Although Mr. and Mrs. W.M. Klein first reported sparrows at Taylor Slough as early as 1957, the record was not corroborated. Werner and Woolfenden 1983 at 60.

Accordingly, Ogden is credited with discovering the breeding population of sparrows in this area in 1972. John C. Ogden, Florida Region 26 American Birds 852 (1972).² Foot surveys by Werner in 1973 indicated that the colony occupied 1200 hectares northwest of the Park Headquarters, but helicopter surveys in 1974 and 1975 extended the total range of the population to be between 8,000 and 12,800 hectares. See Werner 1975 at 32. This "population," has been split by more recent researchers into subpopulations C, B, D, E, and F. Compare Werner 1975 at 33, Figure 12, with U.S. Army Corps of Engineers, 1998 Cape Sable Seaside Sparrow Breeding Distribution (FINAL) (1998)(Exhibit 14). As discussed below, the decline in sparrows in subpopulation F, C, and D of this area has been attributed to the modification of the area's hydrology and the invasion of exotic trees.

As shown on the Corps' 1998 map of sparrow breeding locations, see Exhibit 14, the sparrow population currently is divided into six subpopulations. Subpopulation A, one of the core populations, inhabits the marl prairies west of Shark Slough in Everglades National Park and extending into Big Cypress National Preserve. This population is located completely outside the designated critical habitat. Subpopulation B, another core population, inhabits the marl prairies southeast of Shark Slough near the center of Everglades National Park, and to the west and northwest of Taylor Slough. This population is within designated critical habitat. Subpopulation E is located north of population B and SR 9336, and is within

² Interestingly enough, the first sparrow that was found from this population was located in 1971 in the nest of a Short-tailed hawk nest near Royal Palm, and was misidentified as

the designated critical habitat. Subpopulation C is located along the eastern boundary of Everglades National Park, to the west and south of S-332, and is within designated critical habitat. Subpopulation D is located southeast of population C and east of Taylor Slough, and is only partially within critical habitat. Subpopulation F is located to the north of population C, on the western edge of the Atlantic Coastal Ridge, and partially within the designated critical habitat.

As is shown in Table 2, the population of each of the sparrow subpopulation has fluctuated between the original census of 1981 and 1998, the last year for which census data have been released.

Table 2. Population estimates for Cape Sable Seaside Sparrow populations.

Population	1981	1992	1993	1994	1995	1996	1997	1998
A	2688	2608	432	80	240	272	272	192
B	2352	3184	2464	2224	2128	1888	2832	1808
C	432	48	0	-	0	48	48	80
D	672	112	96	-	0	80	48	48
E	112	592	320	112	352	208	832	912
F	112	32	0	-	0	16	16	16
Total	6656	6576	3312	2416	2720	2512	4048	3056

MSRP at 4-359. However, as discussed in this Petition, while some natural variation in population numbers are to be expected in a sparrow species, the extreme drop in population

another subspecies of seaside sparrow Id; see also John C. Ogden, Florida Region 25 American Birds 734 (1971).

A, from 2608 birds in 1992 to 192 birds in 1998, is not due to the effects of chance, and raises serious concerns about the sparrow's continued existence.

E. MOVEMENTS

The sparrow is non-migratory. 1999 BQ at 26. Werner and Woolfenden found that sparrows studied at Taylor Slough and Ochopee had all-purpose breeding territories within which all mating, nesting, and feeding occur. Werner and Woolfenden 1983 at 67. They found that sparrows defend territories between 0.3 to 6.8 ha, with the mean being 1.4 ha at Taylor Slough and 3.6 ha at Ochopee. Id. Lockwood et al. found that three males nested an average of 40 meters away from their 1995 nests; second clutch nests ranged 8 to 95 m from the site of the first clutch nest. Julie L. Lockwood et al., Life History of the Endangered Cape Sable Seaside Sparrow 109 Wilson Bulletin 720 (1997) ("Lockwood et al. 1997") (Exhibit 15).

Dean and Morrison, based on radio telemetry studies, found that mean home range size for all birds at their study sites combined was 13.02 ha $\pm$ 1.30 (SE) (range 6.5 to 29.4 ha, n=17 birds). Dean and Morrison 1999 at 20. They found that the sparrows' home ranges and scope of movements, in general during the non-breeding season, seem to be greater than during the breeding season. Id. The sparrows were "relatively sedentary" during the non-breeding season, with distances between consecutive locations averaging 158.2 m (SE=5.2, n=1694) for all sparrows. Id. at 20-21.

Dean and Morrison found that the great majority of each individual's movements were within the home range; however, they recorded instances of relatively long movements away from the home range. Id. at 21. The upper 10th percentile of the movements

distribution includes all movements over 285 m; the maximum distance between consecutive movements for each individual was generally between 300 and 1000 m. With the exception of three individuals – which moved approximately 6 km, 450 m, and 7 km – the sparrows returned to their previous home ranges after long-range movements outside of their established home ranges. Id. at 21-23. As one of the sparrows moved approximately 6 km from its original home range and another moved approximately 7 km from its original home range, Dean and Morrison concluded that movements in excess of 5 km “may not be uncommon,” however, they noted that all movements were within tracts of contiguous prairie. Id. at 23.

The relatively sedentary nature of the sparrows is important in determining the effects of hydrological alterations on the viability of the sparrow. As the recent Peer Review Panel noted, “[a]nother piece of evidence that adult sparrows have limited capacity for large-scale movements is that no compensating increase occurred in any of the other populations after flooding of the habitat of Population A. Thus no evidence exists that the birds that had disappeared from Population A moved elsewhere en masse.” 1999 Review Panel at 34. The apparent restriction in the ability of the sparrow to move long distances and leave prairie habitats places the sparrow at further risk, for this reduces the chances of recolonization of subpopulations that are located large distances from other subpopulations.

While this section has presented an overview of the research regarding sparrow habitat, additional factors influence the sparrow’s use of this habitat. As discussed below, water levels, fire, invasion by exotics and woody vegetation, and predation all significantly influence sparrow behavior. These issues are addressed in more detail below.

F. DEMOGRAPHY

This section of the petition reviews factors that influence the sparrow's demography, including reproduction timing, egg numbers and number of clutches, nest heights and the effects of water levels on nesting, predation, and longevity.

1. REPRODUCTION TIMING, EGG NUMBERS AND NUMBER OF CLUTCHES

Lockwood et al. note that it "appears that the onset of nesting varies by only a few weeks annually." Lockwood et al. 1997 at 722. Based on their study, nest building begins "around mid-March;" in 1995, the first nest was found 18 April, and held nestlings 5-6 days old. In 1996, the first nest in which an egg was found was an egg laid March 27. Id. at 722. This is consistent with Werner, who observed flightless fledglings as early as 2 April, indicating to him that the beginning of that nest cycle was late in February.

The nesting cycle ends in May to July, depending on the onset of summer rains. Lockwood et al. note that "[c]essation time may vary by as much as a month or more..." Id. "The latest nesting activity occurred in mid-May 1995 and late June 96, concurrent with the onset of summer flooding." Id. This is consistent with additional data added by other researchers under Pimm et al., who have identified 117 sparrow nests since 1995; of those, 93% were active (i.e. held young or eggs) during April and May; four nests were found in March and 4 in June. Stuart Pimm et al., Response to AOU Review Committee on the Cape Sable Seaside Sparrow 12 (1999)("Pimm et al. 1999")(Exhibit 16). Werner notes that eggs have been observed (although destroyed by predators prior to hatching) as late as July 7, and nestlings as late as July 26. Werner 1975 at 163. Some nesting may occur later, as Dean et al. have sighted recently fledged young as late as September.

However, even Dean et al. note that the "majority of fledgling production probably results from the early nest attempts in most years." Dean and Morrison 1999 at 5. Thus, the best available scientific data indicate that "[t]hese late season nesting attempts represent a tiny fraction of overall breeding activity within one season." Pimm et al. 1999 at 12.

Sparrows have the capability to raise more than one brood of nestlings. Lockwood et al. note that four of the five 1995 nests and 13 of the 19 1996 nests were first clutches; they positively identified four second clutch nests in 1996 and none in 1995. One nest in 1995 and two in 1996 coincided with known second clutches. A nest found with eggs in late June 1996 was a positively identified third clutch. Werner indicated that no individual appeared to be more than triple-brooded and many appeared to be only double-brooded." Id.

Lockwood et al. note that the population laid an average of 3.2 eggs per nest (N=14, range = 2-4, mode = 3,4). Werner observed that sparrows normally laid 3 to 4 eggs at the Taylor Slough study site, with 50% of the nests (n=16) containing 4 eggs, 44% containing 3 eggs or nestlings, and 6% containing 2 nestlings. Werner 1975 at 148. In the Lockwood et al. study, 15 young fledged from 26 first clutch nests; none of the eight second clutch eggs hatched; the sole third clutch nest (of two eggs) was abandoned. Overall, they found 36 eggs from which 15 young fledged (N=14), giving a crude success rate of 42%. Werner notes that of 16 nests observed, fledglings in 25% of the nests were known to have fledged successfully (31% of the nestlings, N=41); an additional 44% were believed to have fledged (45% of the nestlings) but young were not observed; 6%

might have fledged (7% of the fledglings); 5% were believed to have failed due to predation (5% of the nestlings); and 19% were known to have failed due to predation (12% of the nestlings). Werner 1975 at 158.

Likewise, "[l]ater nesting attempts are probably more likely to fail than early attempts in general, but some level of fledgling production occurred late in the season in both years of our study." Lockwood et al. estimated the nest cycle to be 34 to 44 days; including 3 to 4 days for egg laying (as the average number of eggs laid is 3.2), 12 days of incubation, 9.2 days for fledging; and 8 days for adults feeding juveniles.

2. NEST HEIGHTS AND THE EFFECTS OF WATER LEVELS ON NESTING

Research has established that water levels play a dual role in influencing nesting success. As discussed below, water levels influence predation rates. In addition, levels influence the length of the breeding season. This section first will review the best available scientific data regarding nest heights and then review the link between water levels and successful reproduction.

Werner's study of sparrows collected data on 16 nests at Taylor Slough between 1973 and 1975. Measured from the bottom of the nest, the mean height above substrate was 18 cm, and the range was from 6 to 37 cm. Werner 1975 at 147. Lockwood et al. note that based on their study of nests during 1996, the average height of nests above the ground was 14 cm; unfortunately, the range and number of nests were not provided. Lockwood et al. 1997 at 727. Pimm et al. note that adding two additional years of surveys to the Lockwood et al. data provides a total of 101 measured nests; the average height off the ground is 18 cm with a range of 3 to 33 cm. Pimm et al. 1999 at 6.

Werner and Woolfenden noted that when the prairie "flooded" in early July, breeding "appeared to terminate then." Werner and Woolfenden 1983 at 70. However, no details were provided regarding the particular levels that terminated breeding.

Lockwood et al. studied breeding season behavior in 1995 and 1996; they found that water levels directly influenced the success of two nests. Lockwood et al. 1997. The first nest, found on June 6 with four eggs, hatched three young on June 8. When water flooded the bottom of the nest on June 12, all nestlings disappeared. The level was 15 cm deep, a depth 1 cm above the bottom of the nest. Id. at 723. The second nest, discovered on June 20 with two eggs, flooded two days later and incubation ceased. Here, the level was 23 cm deep, again 1 cm above the bottom of the nest. While water levels peaked at 18 cm in late June, with a subsequent dry-down occurring in mid-July (down to 4 cm), breeding activity never resumed. Id. at 728. Lockwood et al. concluded that breeding behavior ceased in their study areas when surface water reached an average height of nests above the ground (14 cm.). Id. at 727.

Nott et al. reached similar conclusions as to the effects of water levels on nesting. Nott et al. 1998. They noted that the sparrow breeds only during the dry period, when the water table can be as low as 1 m below the surface. Id. at 25. Sparrows breed until the onset of summer rains, and their research has "established a tight empirical connection between dry conditions and breeding." Id. They "consistently failed to hear singing birds when the water levels exceeded 10 cm, as nests are built 10 to 20 cm above the base of grass tussocks, levels above these heights flood the nests and so restrict the breeding habitat. Id.

Dean and Morrison also examined the influence of water levels on sparrow behavior. Dean and Morrison 1999. They noted that while the research locations appeared relatively flat and level, in reality, elevation varied at one site by 20 cm and at another site by 30 cm. As a result, even during wet periods, portions of the prairie may be only shallowly inundated Id. at 25. The variation in depth of inundation and some small areas of higher elevation may have allowed sparrows to initiate territorial activities despite the fact that average water depths were in the range of 15-20 cm in February, and also may have allowed sparrows to fledge young as late as August, when much of the area was deeply inundated. Id. at 25-26. Thus, they conclude that "average water levels in excess of 10 cm may not preclude nesting because micro-sites may be drier." Id. at 26. Unfortunately, Dean and Morrison did not provide details regarding what would be an excessive level at the nest to allow sparrow reproduction to be successful; the report only includes a graph listing levels at the "control point" for the two study sites between July and February. Id. at 60, Figure 14. It should be noted, however, that the paper does not claim that a sparrow can successfully reproduce when the nest is flooded.

The unpublished paper prepared by Dean for the AOU Peer Review Panel provides additional details and qualifications regarding the research. Tylan Dean, Non-Breeding Season Ecology of Cape Sable Seaside Sparrows, Project Summary (1999)(unpublished paper on file with BLF)(Exhibit 17). He notes that two nests were monitored when water levels were "high and/or rising" during the end of the 1998 breeding season. Both nests would have been initiated (nest-building) when water levels were < than 10 cm, but water levels would have been just over 10 cm. during egg-laying. While nests were active (eggs or

young present), water depths directly below the nest exceeded 20 cm. One of the nests failed near hatching, but the other successfully fledged three young. Id. at 14. Dean concluded that the “sample of known nests during wet periods is too small for me to comfortably draw conclusions except that the Cape Sable seaside sparrow is capable of successfully raising young during wet periods near the end of the breeding season. However, I should caution that we do not claim that all, or even a majority of nests during this period might be successful. We would not have been as likely to locate nests that failed early or were inundated.” Id. at 14-15.

Applying the best available information to the sparrow, all of the information establishes a crucial link between water levels and nesting success. The sparrow nests close to the ground, with an average nest height of 18 cm. Pimm et al. 1999 at 6. BLF’s extensive review of the literature has not located any information suggesting that Cape Sable seaside sparrows can successfully nest when their nests are flooded; as Dr. Pimm et al. have succinctly noted, the “sparrows do not breed under water.” Id. And, it is important to emphasize that even the minor disagreements between Dean and Morrison and the other researchers on the precise water level in which nesting can occur successfully are not relevant for reviewing the effects of the hydrological modifications on population A, west of Shark River Slough, because the flooding of sparrow habitat there has been so excessive.

As one expert peer review panel concluded in 1996:

One of the most serious negative consequences of the high water even was the extensive flooding of the Muhlenbergia-dominated grasslands west of Shark River Slough, which seemed to virtually eliminate breeding habitat of the western Everglades population of Cape Sable sparrows (*Ammodramus maritimus mirabilis*) for three years, during which time the sparrow population in that area declined precipitously.

Gordon H. Orians et al., Report of the Panel to Evaluate the Ecological Assessment of the 1994-1995 Highwater Levels in the Everglades 2 (1996)(unpublished manuscript on file with the BLF)("1996 Peer Review")(Exhibit 18).

The 1999 Peer Review Panel reached similar conclusions. The Panel observed that the relation between water-level and nesting activity deserves further research, mainly to better define the correlational relationship between water levels measured at large scales and sparrow productivity. 1999 Peer Review at 23. However, the Panel further noted that:

“[m]ore importantly, a better understanding is unnecessary to evaluate the effects of water level during the 1990’s... Although one might quibble about details and causes, it is quite clear that there were substantial changes in both the magnitude and duration of flooding in western Shark River Slough, and these likely had a major impact on Population A.”

Id. The Panel concluded that “[d]eep water in Area A during the period of inundation between 1993 and 1996 renders moot the question of precisely which habitat acceptability rule one applies based on nest heights. During this period, water levels in most of the area were well above the acceptable range.” Id. at 25.

As discussed in this Petition, while water levels are determined in part by rainfall, it is important to emphasize that the levels over sparrow habitat are not a product of mere chance. Rather, as discussed in detail below, levels are primarily influenced by the Corps’ and Districts’ operation of the C&SF Project. These agencies’ manipulation of the timing, distribution, and quantity of the water deliveries to the Everglades jeopardizes the continued existence of the sparrow.

3. PREDATION

Predation appears to be an important influence on the sparrow's nesting success. In a study of sparrows nesting in 1995 and 1996, Lockwood et al. found that predation accounted for 78% of all losses of young or eggs. Lockwood et al. 1997 at 723. In the first five weeks of the breeding season, a nest succumbed to predators on less than 3% of all the days when eggs or nestlings were present. Beginning in late May, this rate reached 13%. Thirteen nests were first clutches. Only two of the other six nests (i.e., second and third attempts) successfully fledged young. Id. at 723-724. They noted that the "presence of surface water corresponded with the late season increase in predation rate." Id. at 724. Lockwood et al. did not directly observe any predation events. Id.

In her review of the 1998 breeding season, Lockwood found that predation accounted for almost all nest losses – 92%. Lockwood, 1998 Breeding Season Summary (1998)(Exhibit 19). She noted, however, that there were no peaks in predation rate in 1998 as compared to her earlier study; she believed that the absence of peaks "may be the result of the absence of surface water" during the study period at the breeding site. Id. at 3.

Dean and Morrison documented three predations of radio-collared sparrows (out of 21 birds); all appeared to have been taken by avian predators. Dean and Morrison 1999 at 32. Dean has also indicated that a cottonmouth snake had taken a sparrow. MSRP at 4-360. Kushlan and Bass suggested that rice rats (*Orzmyus palustris*) and snakes threaten nests. Kushlan et al., Cape Sable Sparrow Management Plan (1982). Ogden found an adult sparrow in a Short-tailed Hawk (*Buteo brachyurus*) nest. Ogden 1972. Ants are also known to kill nestlings. Werner and Woolfenden 1983 at 62. While additional information would

be helpful, existing information indicates that predation plays an important role in the success of sparrow nesting.

4. SURVIVORSHIP

Pimm et al. state that their "banding estimates, based on several hundred birds, show that territory holding birds have an annual survivorship of about 50% per year." Pimm et al. 1999 at 22. Utilizing the same data and correcting for the probability of resighting, Knott obtained an estimate of 56% for adult male survival. 1999 Peer Review at 38.

Utilizing available information, the AOU peer review panel created a simple model of sparrow demography, and noted that:

Although there is a large degree of variation in model outcomes, several conclusions emerged. First, unless the rate of annual survival exceeds 0.60, the opportunity to attempt a second brood appears to be the difference between a declining and increasing population. Second, if reproduction and survival are correlated (i.e., good years have both high reproduction and survival, and bad years suffer the reverse), then the sparrow population is capable of a "boom and bust" life history that characterizes other Everglades species (e.g., Bessinger 1995). It may suffer "bust" years when conditions are poor, productivity is negligible and populations decline, but populations may also be able to increase rapidly when favorable conditions enable multiple brooding.

1999 Review Panel at 39. The survivorship information raises serious concerns for the long-term viability of the sparrow under current water management schedules. As discussed above, sparrows have a narrow window of water levels that allow successful reproduction. As discussed below, multiple years of adverse changes to breeding habitat have sharply reduced sparrow numbers and jeopardized the continued existence of the sparrow.

G. FIRE

Fire plays a complex role in modifying the composition of the marl prairie vegetation, and accordingly, the sparrow's use of this habitat. Early on, Stimson, based on his observations of the effects of fires in Big Cypress in 1957, 1959 and 1961, raised concerns that fires could significantly reduce sparrow numbers. Stimson 1961. Likewise, Kushlan and Bass noted that "[t]oo frequent or too severe fire, especially combined with drainage, can markedly affect sparrows... Considering the dramatic effects of fire on habitat occupancy by sparrows, it seems likely that fires covering large areas too frequently would render considerable habitat unsuitable." Kushlan and Bass 1982 at 145 (citations omitted).

Research by Werner in the early 1970s raised another concern: that sparrows could be threatened by the lack of fire. Werner 1975. Without fires, prairies could succeed to hardwoods, which would preclude sparrow use. Id. at 198; see also Werner and Woolfenden 1983 at 63 (in the absence of fire, sparrows are threatened by the natural succession of Everglades prairies to hardwoods). Also, without fire, the density of dead Muhlenbergia grass would accumulate, resulting in lower sparrow densities as early as the fourth year. Id. at 200.

Research has shown that many factors play a role in determining the effect of fire on the sparrow. As discussed below, alteration of hydroperiods has increased the risk of fires in the eastern subpopulations. In addition, the percent of contiguous available habitat burned, frequency of burn, size of colony burned, and proximity of adjacent colonies are significant factors. Werner 1975 at 197. The soil depth also plays a role. Taylor found that sparrow populations recovered more rapidly following fire on prairies with deeper

soil (> 40 cm.), but where soil was shallower (< 20 cm.) or where considerable pinnacle rock occurs, recovery was only beginning after 4 years. Dale L. Taylor, Fire Management and the Cape Sable Sparrow, in The Seaside Sparrow, Its Biology and Management (Thomas L. Quay et al. eds. 1983)(Exhibit 20).

More recent research regarding the effects of fire provides important new information. Curnutt et al. reviewed the dates and extent of fires in ENP from July 1982 to April 1996 – research on a temporal and spatial extent that is greater than previous research – and reached conclusions that differed from the 1975 work of Werner and the 1983 work of Taylor. John L. Curnutt et al., Population Dynamics of the Endangered Cape Sable seaside-Sparrow 1 Animal Conservation 11 (1988)(“Curnutt et al. 1998”)(Exhibit 21). Curnutt et al. found that:

Sparrow numbers were highest where there had been one or two fires over the previous 10- year period. Sparrows were found at lower numbers at sites with fire frequencies of three to six, and were absent from sites that burned seven or more times. The different responses of sparrows to fire frequencies are significant (ANOVA: $F=6.62$ d.f.=433; $P<0.001$), and the highest values were significantly different from the others.

Id. at 18-19. They also found “a significant positive relationship between time since fire and sparrow numbers for up to 10 years post-fire ($R^2=0.15$; $F=6.79$, $P=0.01$) and no evidence for a decline.” Id. at 19. They concluded that “frequent fires are harmful to the sparrow. The very frequent burns along the north-eastern edge of the sparrow’s range (populations C and F) are the likely cause of its decline there. Many of these burns are the consequence of unplanned human ignition.” Id. However, as they note, there is “a complication: these prairies are overdrained, compared with their original state. The water that would have seasonally inundated them is now diverted to the west... [I]t seems likely

that wet prairies would burn less readily than dry ones. The implication is that the management action of diverting the water from the east has severely harmed the sparrows there." Id. at 20.

Curnutt et al. also note the risk to subpopulation B from fire. "The well-being of the prairies hosting subpopulation B," they observe, "is critical to the survival of the Cape Sable seaside-sparrow. This area currently holds almost all the remaining sparrows, and does so in an extent a quarter of the size of the Ingraham fire of 1989. Even one dry-season fire, of modest size, malevolently located in this area, could reduce the sparrows' numbers to very low levels for a few years. Unlike in 1989, there are now very few populations from which the birds might re-colonize burned areas." Id.

The Service, in its recent Biological Opinion on the effects of the Experimental Program of Water Deliveries to ENP, has reached findings that are similar to the recent research discussed above. Fires "prevent hardwood species from invading these [Muhlenbergia] communities and prevent the accretion of dead plant material, both of which decrease the suitability of these habitats for Cape Sable seaside sparrows." 1999 BO at 23.

Yet, under the Experimental Program, fires also have harmed the sparrow:

Test 7, Phase I, is anticipated to result in the continued decline in the eastern Cape Sable seaside sparrow subpopulations and further deteriorate suitable nesting habitat conditions. This decline is related to over-drainage and the resultant shift in the vegetative community, which increases the frequency of fire such that it becomes detrimental for sparrow breeding (Pimm 1997). Nott *et al.* (1998) and Curnutt *et al.* (1998) attribute declines to over-drainage and resultant fire frequencies in the areas of subpopulations E and F and almost all of subpopulation C located upstream of S-332, along with flooding that eliminates suitable nesting substrate in the southern part of subpopulation C, located immediately downstream of S-332. These vegetation changes, in turn, are directly

related to the hydroperiod, or the number of days per year a marsh is flooded (Van Lent et al. 1999).

1999 BO at 67-68.

The Service Recovery Plan contains similar observations. After reviewing the research of Werner and Taylor, the Service notes that:

More recent research (Curnutt *et al.* 1998) documents increasing sparrow numbers up to at least 10 years following fire. Several recent authors (Curnutt *et al.* 1998, Nott *et al.* 1998, Pimm *et al.* 1996) agree that annual or biannual fire return frequencies over large areas of the sparrow's eastern habitats are directly linked to reduced hydroperiods in these areas produced by current water management practices, and are the most likely cause of declines, and failure to recover, in populations F and C.

MSRP at 4-361. In addition, the Recovery Plan specifically raises concern about the adverse effects of lack of fire: "subpopulation B habitat has not experienced a large-scale fire since 1989, and Everglades NP fire experts warn that occurrence of a large, possibly catastrophic fire in this area is only a matter of time (J. Seger, Everglades NP, personal communication 1998)." Id. at 4-362.

In summary, the proper management of fire in sparrow habitat will play a significant role in determining the continued existence of the sparrow. As noted above, subpopulations C, F, and the population of C located upstream of S-332 have declined as a result of excessive fire, which is exacerbated by the effects of artificially lowered water levels. In contrast, subpopulation B – which is the largest subpopulation of sparrows by far with 1808 birds in 1988 – has not had a significant recent fire. This raises serious concerns that an uncontrolled fire could result in a severe population decline, as has been seen in other areas of sparrow habitat.

H. EXOTIC AND WOODY VEGETATION INVASION

Exotic plants within the habitat of the sparrow include Australian pine (*Casuarina* spp.), melaleuca (*Melaleuca quinquenervia*), and Brazilian pepper (*Schinus terebinthifolius*). As of 1993, the approximate range of these species in south Florida is 151,246 hectares for Australian pine, 197,827 for melaleuca, and 284,708 hectares for Brazilian pepper. Don C. Schmitz et. al., The Ecological Effect of Nonindigenous Plants in Strangers in Paradise: Impact and Management of Nonindigenous Species in Florida 41 (Daniel Simberloff et al. eds. 1997).³

The primary concentration of melaleuca in ENP is in the expansion area; over half of the 42,700 ha (165 square miles) is infested with this species. David T. Jones, Invasive Exotic Plant Management Programs at Everglades and Dry Tortugas National Parks § 1.4.1 (1999)(unpublished manuscript on file with BLF)(Exhibit 22). A mapping effort that has reviewed 70% of ENP determined that as of 1994/95, Brazilian pepper occupied 12,819 ha and Australian pine occupied 278 ha. Id. at § 1.6.2. In BCNP, the treatment program has reduced the extent of melaleuca from 119,000 acres to approximately 48,000 acres. Antonio J. Pernas & William A. Snyder, Status of Melaleuca Control at Big Cypress National Preserve 4 (in press)(Exhibit 23)(“Pernas and Snyder”).

For several decades, scientists have repeatedly recognized the threat that the spread of exotic trees poses to the native vegetation of the marl prairie. As early as 1975, Werner noted that the size of the habitat for the Taylor Slough population was declining due to the loss of prairie to Australian pine, melaleuca, and Brazilian pepper. Werner

1975 at 46-47. "Observations of these exotics," he noted, indicated that once a portion of a prairie was inundated by any of these exotic trees, their growth rate was sufficient to alter that portion of the habitat beyond utilization by Cape Sable Sparrows within several years." Id. at 47; see also Werner and Woolfenden 1983 at 60 (same). Likewise, Kushlan and Bass found that sparrows are not found in habitat containing trees and bush such as extensive pine, cypress, or mangrove forests, and that the "greatest threat to an extant population is in the East Everglades, where loss of habitat is occurring due to drainage, frequent fires, invasion of exotic trees, and agricultural and urban development." Kushlan and Bass 1983 at 139, 145. However, it is important to note that it is not only exotic trees that pose a threat; the invasion of native trees due to reduced hydroperiods also is a concern. Curnutt et al., for example, note that very low or nonexistent number of birds found in recent surveys of population F, and observe that this area is bounded to the east by agricultural fields and "is surrounded by habitat unsuitable for sparrows, primarily due to high densities of native and exotic shrubs." Curnutt et al. 1998 at 17.

The Service has echoed the concerns of scientists. The Sparrow's Recovery Plan notes that frequent fires, linked to reduced hydroperiods, have caused the decline of populations C and F, and that this "effect is exacerbated by invasion of exotic and other woody vegetation over much of the eastern marl prairies, rendering the habitat unsuitable for sparrow breeding even when fire frequencies are reduced." MSRP at 4-361 – 4-362. Clearly, there is a consensus in the scientific community that the invasion of exotic and

³ The authors note that "one infested hectare can represent anything from presence of an individual plant to a densely packed monospecific strand." Id.

woody vegetation modifies the structure of the vegetative communities and renders the habitat unsuitable for use by sparrows.

I. WATER QUALITY

Only limited questions have been raised regarding the effects of water quality degradation on sparrow habitat. Nott et al. note:

Increased production and changes in the periphyton result from increasing water levels and longer hydroperiods (Browder, Gleason & Swift, 1994), or from nutrient enrichment (McCormick & O'Dell, in press). Normally submerged, periphyton mats can become floating mats and shade out submerged macrophytes (Van Meter-Kasanof, 1973). Field observations suggest that as heavy floating periphyton mats dry they can flatten and selectively kill the above-ground portion of Muhlenbergia and other vulnerable species. In contrast, sawgrass can penetrate this thick mat. An area of several square kilometers once dominated by mixed prairie was covered by such a mat after the waters receded in 1996. It no longer held the breeding population of the sparrows that it once had.

Nott et al. 1998 at 31. In addition, to these specific limited concerns, significant issues have been raised about the general role that water quality degradation has played in threatening the ecological health of the Everglades. See, e.g., Service, Draft Fish and Wildlife Coordination Act Report, Central and Southern Florida Comprehensive Review Study (1999). Thus, the Service should consider this issue in revising the discussion of the constituent elements of critical habitat for the sparrow.

V. STATE, FEDERAL AND PRIVATE ACTIONS AFFECTING THE SPARROW AND ITS HABITAT

In order to understand why the currently designated critical habitat boundaries are inadequate, one must understand how federal and state agencies have managed the ecosystems of southern Florida and the role that private interests have played in influencing the management of these areas. This section reviews the manner in which

people have altered the hydrology of south Florida, fragmented and adversely affected sparrow habitat, jeopardized the continued existence of the sparrow, and adversely modified and destroyed critical habitat.

Before major drainage activities began early in this century, the seven physiographic landscapes of the Everglades comprised an almost 1.2 million hectare wetland system. Steven M. Davis et al., Landscape Dimension, Composition, and Function in a Changing Everglades Ecosystem, in Everglades The Ecosystem and Its Restoration 427 (Steven M. Davis & John C. Ogden eds. 1994). As shown in Table 3, drainage and human development during this century have reduced the Everglades by half. Id. at 427-427. Urban and agricultural development has resulted in the destruction of 59,000 ha (24%) of the southern Marl marshland, all on the eastern side of the Everglades. Id. at 228.

In addition to the physical destruction and fragmentation of Everglades habitats, there also have been massive modifications in hydrology and resulting changes to floral and faunal composition. The Corps has noted that the pre-drainage wetland ecosystems of south Florida had three essential characteristics: a hydrologic regime that featured dynamic storage and sheet flow; large spatial scale; and heterogeneity in habitat. Corps, Central and Southern Florida Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement 2-1 (1999)(“Restudy”). The “structure contributing to dynamic storage included the very shallow elevation gradient, the vast expanses of emergent vegetation, the thick peat substrates, sand hills, and highly permeable limestones. The water masses were

constantly progressing downslope but so slowly that, in effect, water was stored in the system during one season to use in the next season. Transportation of water masses within a structural element varied from a number of months to a number of years.” Id. at 2-3.

Table 3. Spatial Coverage of Everglades Landscapes

Landscape Type	Predrainage (ha)	Current (ha)	Percent loss
Swamp forest	60,000	0	100
Sawgrass plains	238,000	63,000	74
Slough/tree island/sawgrass mosaic	311,000	271,000	13
Sawgrass-dominated mosaic	179,000	94,000	47
Peripheral wet prairie	117,000	0	100
Cypress strand	12,000	0	100
Southern marl-forming marshes	249,000	190,000	24
Total Coverage	1,166,000	618,000	49

In 1947, 100 inches of rain fell on south Florida, followed by two hurricanes and a tropical disturbance. Id. at 1-25. In response to the widespread flooding, Congress passed the Flood Control Act of June 30, 1948, Pub. L. No. 80-858, 62 Stat. 1175, which authorized the Central and Southern Florida Project for Flood Control and Other Purposes (“CS&F Project”). The CS&F Project utilizes levees, water storage areas, canals, and large-scale pumps to manage the hydrology of central and south Florida. Generally speaking, the Corps designed and constructed the CS&F Project and operates and maintains project works on the St. Lucie Canal; Caloosahatchee River; Lake

Okeechobee levees channels, locks, and major spillways and the main outlets for Water Conservation Areas 1, 2A and 3A. Corps, Central and South Florida Project Reconnaissance Report Comprehensive Review Study 33 (1994). The District, as the local sponsor of the C&SF Project, is responsible for operating the remainder of the Project in accordance with regulations prescribed by the Corps and has an essential role with the Corps in developing water management criteria. Id. The primary system of the C&SF Project includes about 1,000 miles each of levees and canals, 150 water control structures, and 16 major pump stations. Id. at 4.

While the C&SF Project has drastically modified the historical hydrology of south Florida, two areas are of particular relevance to the existence of the sparrow: Shark Slough and Taylor Slough. The "historic center of the Shark River Slough," the Corps has noted, "passed through what is now WCA No. 3A, then into WCA No. 3B, then crossing the East Everglades and into the Park near the middle of the L-67 Extension. Under historic natural conditions, all four of these areas responded similarly to hydrologic events." Corps, Central and Southern Florida Project for Flood Control and Other Purposes, Part 1, Agricultural and Conservation Areas Supplement 54, General Design Memorandum, Modified Water Deliveries to Everglades National Park (25 (1992))("GDM"). However, under the current operating criteria, the historic flow way has been almost eliminated, with direct rainfall and seepage primarily providing water to the East Everglades. Water deliveries to Shark Slough are provided through the S-12 structures, which are west of the center of the historic flow way. Id. at 25. The L-67 Extension "prevents these discharges from spreading into the center of the historic flow-

way in NESRS [northeast Shark River Slough]. Also, a significant portion of water discharged at the S-12 structures is conveyed down the L-67 Extension borrow canal, and, under wet conditions, water levels can be substantially higher west of L-67 Extension than those to the east as a result.” Id. at 25.

Taylor Slough, which encompasses more than 158 square miles of freshwater marsh, extends from its upstream end north of the Frog Pond to the coastal mangrove fringe along central Florida Bay. The headwaters of the slough originate in the Rocky Glades, which forms the hydrologic divide between Shark River Slough and Taylor Slough. Thomas Van Lent et al., Water Management in Taylor Slough and Effects on Florida Bay 1 (1993)(“Taylor Slough Management”). Prior to construction of the Project in western Dade County, water levels in the Taylor Slough headwaters were 1.5 to 2.5 feet higher than today. Id. Lowering water levels in the L-31N and L-31W, beginning in 1982, has caused a dramatic and detrimental effect. As the L-31N canal cuts through the Rocky Glades, “management of water levels in this reach of the canal system largely controls the water levels and inflow volumes to the downstream areas of the Taylor slough basin.” Id. at 9. Likewise, lowering of levels in the L-31W causes the canal to act as a groundwater sink draining adjacent wetlands, and is incompatible with restoring fresh water flows to the Taylor Slough basin. See Robert A. Johnson et al., Hydrologic Effects of the 1984 through 1986 Canal Drawdowns on the Northern Taylor Slough Basin of Everglades National Park (1988).

In August and September of 1981, two “extreme rainfall events produced extensive flooding in western Dade County, particularly in the unprotected East

Everglades area west of L-31.” Taylor Slough Management at 10. In June of 1982, the District lowered the operating criteria in the L-31N canal; this modification occurred “in response to threats of lawsuits by landowners in the East Everglades/south Dade area.” Id. An analysis of annual inflows and outflows to L-31N between S-335 and S-331 shows a “huge disparity” with outflows averaging 187% of inflows; this “indicated that lower canal stages and higher pumping rates at S-331 for flood protection have resulted in enormous losses of water from the marshes adjacent to L-31N.” Id. at 28.

In March of 1983, following record rainfall and “extremely high dry season flows through the S-12 structures,” Everglades National Park presented a “seven point plan” to the District which called for “immediate relief from these regulatory releases.” Taylor Slough Management at 12. These flows, the Corps has recognized, resulted in “a significant deterioration in the Park’s ecological conditions....” GDM at 22. The Park’s seven point plan called for several actions including removing the L-67 extension levee and filling the canal, diverting as much water as possible into Water Conservation Area 3B and distributing water deliveries from Water Conservation 3A along the full length of Tamiami Trail from L-28 to L-30.

Pump station S-331 was completed in 1983 as part of the South Dade Conveyance System. Prior to the completion of S-331, the southward movement of water down the L-31N canal was limited to 100 cfs due to the capacity of structure S-173. Taylor Slough Management at 8. While the S-333 was intended to provide additional dry season water delivery capabilities, and did not include a flood control purpose, see id. at 8, 12, the S-

331 is now "used routinely during the wet season to provide additional flood protection for the developed areas west of L-31N." Id.

In November 1983, Congress enacted the Supplemental Appropriations Act of 1984, Pub. L. No. 98-181, 97 Stat. 1153. Section 1302 authorized the Corps, with the concurrence of the Service and the District, to modify the schedule for delivery of water from the Project from the minimum flows required by section 2 of the River Basin Monetary Authorization and Miscellaneous Civil Works Amendments Act of 1970, Public Law 91-282. This act also authorized the Secretary "to conduct an experimental program for the delivery of water to the Everglades National Park for such purposes of determining an improved schedule for such delivery." This experimental program, which was implemented through a series of test iterations, was extended through the authority of Pub. L. No. 99-190 and Pub. L. No. 100-676.

On March 14, 1984, the District proceeded with a 30-day field test to document the impacts of releasing a large volume of water into northeast Shark Slough via opening the S-333 spillway. That same day, attorneys for the agricultural interests filed suit and obtained a temporary restraining order, and the gate was closed. See Thomas K.

MacVicar & Thomas Van Lent, Evaluation Report, A Thirty Day Field Experimentation of Water Deliveries to Northeast Shark River Slough, April – May, 1984 2-3 (1984). An agreement between the District and the farmers was reached which specified in detail the test conditions, including water levels in the L-29 canal, water level at well G-596, ground water at four wells, including the Angel's well in the 8.5 square mile area, and water levels in several of the south Dade canals. Id. at 3.

While the 30-day test was conducted during the dry season, the Corps and the District designed a test to induce sheetflow into the northeast Shark Slough during the wet season. See Thomas K. MacVicar, A Wet Season Field Test of Experimental Water Deliveries to Northeast Shark River Slough (1985). As with the 30-day test, a formal legal agreement was negotiated outlining the requirements associated with the use of the S-333; these conditions "altered the normal operating procedures for portions of the south Dade canal network." *Id.* at 3. While the District "felt that the proposal for using S-333 would not increase risk to developed land," the District agreed to maintain lower water levels (below 4.5ft MSL) in the entire reach of the L-31N from S-335 to S-176 for the test duration. The District reasoned that "[l]owering the canal level, which induces a similar reduction in the adjacent groundwater table, was an obvious way to increase the margin of safety related to floods." *Id.* Also, two groundwater monitoring wells "were suggested by representatives of the farmers as a means of insuring that S-333 would be closed when the water level near the developed areas reached a certain point, whether or not the rise was in response to local rainfall or the use of S-333." *Id.* The District noted that there "was neither time, nor sufficient data, for a detailed analysis to choose an ideal trigger level for each site. To avoid delaying the start of the test, it was agreed to close S-333 whenever the water table at wells G-3272 or G-3273 rose above 6.5 ft. MSL." *Id.*

The test was interrupted for two extended periods to close the S-333; *id.* at 3-4, these periods "resulted from a general rise in the water table caused by rainfall over the East Everglades, not surface flow toward the developed area from S-333." *Id.* at 6. The District concluded that under the operating conditions in the test, it "is possible to use S-

333 to divert relatively large amounts of water into Northeast Shark River Slough during the wet season without increasing the flood risk in the developed area west of L-31N." Id. at 1. In addition, the District noted that the "operation of the L-31N/C-111 canal system is the dominant influence on water conditions in the developed portions of the East Everglades, not the use of S-333." Id. at 15. The G-3272 and G-3273 trigger wells, the District concluded, "showed no obvious signs of influence by S-333 and were not good indicators of conditions in the developed areas." Id. at 2.

Test Iteration 1 of the experimental program began in June 1985, and included implementation of a new rainfall based water delivery plan for the Shark Slough, replacement of a fixed regulation schedule in Water Conservation Area 3A with a series of five operational zones, and the reestablishment of surface water inflows into Northeast Shark Slough. See Calvin J. Neidrauer & Richard M. Cooper. A Two Year Field Test of the Rainfall Plan: A Management Plan for Water Deliveries to Everglades National Park (1989). Like the 30 and 90 day tests, this test was conducted only after the District had negotiated and signed an agreement governing implementation of the test with farmers and residents of the Rocky Glades. Id. at 15. During the test, flow into northeast Shark Slough through the S-333 was constrained by water levels in the L-29 canal and G-3273. Id. at 18. Also, utilizing water levels at Angel's well, "the L-31N canal was used to regulate groundwater levels in the existing residential (Rocky Glades) and agricultural area." Id. at 15, 18.

The Corps, District, and Park Service agreed on a split of 45% of the flow to the western section through the S-12s, and 55% to the eastern section, by way of the S-333

and the culverts under the Tamiami Trail which discharge into the northeast Shark Slough. Id. at 11. However, if the amount discharged into the Shark Slough as determined by the model was not enough to keep the water level in WCA 3A within the regulation schedule, an additional regulatory release was made. Id. at 7-10. For the period of the test, only 38% of the target Shark Slough flow passed through the S-333. Id. at 26.

Test iterations two through five "simply extended the experimental testing program with no significant changes in the Test 1 operating criteria for Northeast Shark Slough." National Park Service, A Hydrologic Evaluation of the Experimental Water Deliveries to Everglades National Park Test 6 Iteration 17 (August 11, 1995 Draft)(unpublished manuscript on file with BLF)("Park Test 6 Evaluation"). Test 6 began in July 1993; water deliveries into northeast Shark Slough continued and there were changes in the Taylor Slough criteria. Id. at 17.

The Everglades National Park Protection and Expansion Act of 1989, Pub. L. No. 101-229, 103 Stat. 1946, made several important changes to the Park and the Project. Congress found that the existing boundary "excludes the contiguous lands and waters of Northeast Shark River Slough that are vital to long-term protection of the park and restoration of natural hydrologic conditions within the park." Section 101(a)(1). Congress intended, in passing the Act, to "enhance and restore the ecological values, natural hydrologic conditions, and public enjoyment of said area by adding the area commonly known as the Northeast Shark River Slough and East Everglades to Everglades National Park" and to "assure that the park is managed in order to maintain the natural abundance, diversity, and ecological integrity of native plants and animals, as well as the behavior of

native animals, as a part of their ecosystem.” Section 101(b). Section 102 modified the boundary to include approximately 107,600 acres of the eastern Everglades, and Congress intended that the acquisition should be completed within five years of the Act’s enactment.

Section 104(a)(1) authorized the Secretary of the Army to construct modifications to the Project to “improve water deliveries into the park” and “to the extent practicable, take steps to restore the natural hydrological conditions within the park.” Section 104(a)(2) stated that the modifications shall be based upon the findings of the Secretary’s experimental program authorized in section 1302 of the 1984 Supplemental Appropriations Act and “generally as set forth” in a General Design Memorandum to be prepared by the District entitled “Modified Water Deliveries to Everglades National Park.” Congress noted in section 104(b)(1) that the Secretary of the Army, in consultation with the District, shall make a determination as to whether residents in the 8.5 square mile area (“8.5 SMA”) or “adjacent agricultural areas . . . will be adversely affected by project modifications. . . .” If the Secretary determines that the 8.5 SMA or agricultural interests will be adversely affected, the Secretary is authorized and directed to construct a flood protection system. *Id.* at §§ 104(c), 104 (d).

In June 1992, the Corps finalized the Modified Water Deliveries proposal. GDM. This proposed a rain driven water delivery schedule and structural modifications to the CS&F Project. *Id.* at 59-69. Structural modifications included the construction of three gated culvert structures (S-345A, B and C) in the L-67A between the S-151 and S-333, which would enable discharges from Water Conservation Area 3A into 3B; the

construction of two spillway structures (S-355A and B) which would discharge water from WCA 3B into the existing L-29 borrow canal; and raising a portion of US 41. In addition, to “allow full hydrologic interaction between portions of the slough now separated by the levee,” the GDM proposed leveling the L-67 Extension and disposing of the fill in the borrow canal. Id. at 66.

To “mitigate for increased flood risks” to the 8.5 SMA resulting from “increased water stages” in the northeast Shark Slough and the Park purportedly due to the project, the GDM also called for “flood mitigation” through the construction of two pump stations, a double levee, and a canal around the western and northern reaches of the area. The GDM noted that the residential area “is not provided any direct flood protection by the CS&F Project” and that it is “subject to frequent flooding.” Id. at 42. However, “[s]ince 1985, when L-31N borrow canal stages have been manipulated to prevent adverse flood impacts in the area due to the testing process, the level of flood protection has been enhanced.” Id. In addition, studies by the District “indicate that rainfall over the last two decades has been significantly below normal” and a “return to more natural rainfall patterns in the future will exacerbate the flood problems in the developed East Everglades.” Id. at 43. The Corps stated that the GDM project “rarely would flood the area directly if no flood mitigation is provided,” but the Corps claimed that the GDM would cause higher groundwater levels, reduce the available groundwater storage, and increase the frequency of flooding. Id. at 42.

The Corps estimated that construction of the GDM features would take five years. Id. at 89. The Corps rejected a “phased construction” option of degrading the L-67

extension and constructing the flood mitigation works first and then restoring flows through to WCA 3B. Id. at 89-90. However, the Corps recommended an important limitation on the project's construction: the L-67 Extension "cannot be degraded until all affected lands have been acquired and construction of the flood mitigation system and pump stations S-356 and S-357 have been completed." Id. at 89.

In August 1992, Hurricane Andrew, a category 4 storm, struck Dade County, "causing extensive destruction. The 8.5 square mile area was particularly hard hit. Many homes and [sic] were destroyed. Since then, however, most residents have rebuilt and improved their properties." East Everglades 8.5 Square Mile Area Study Committee, A Report to Governor Lawton Chiles 13 (1995)("8.5 Committee"). Likewise, Tropical Storm Gordon, in combination with lesser storms, dropped over 80 inches of rain in some parts of Dade and Broward counties. Id. at 15. In the 8.5 SMA, approximately 30.85 inches fell during September through December. There were "minor reports" of residential flooding; however, "many roads and properties were inundated for weeks at a time." Id.

In October 1992, Congress passed the Water Resources Development Act of 1992, Pub. L. No. 102-580, 106 Stat. 4797. Section 309(l) provided that the Chief of Engineers should determine whether modifications to the Project "are advisable at the present time due to significantly changed physical, biological, demographic, or economic conditions, with particular reference to modifying the project or its operation for improving the quality of the environment, improving protection of the aquifer, and

improving the integrity, capability, and conservation of urban water supplies affected by the project or its operation.”

In May, 1994, the Corps issued the Final Integrated General Reevaluation Report on the C-111 Project. The C-111 Project consists of several significant modifications to the CS&F Project, including: construct S-332E and Canal 111N – a spreader canal and a pump station; construct the L-31W and S-332D Tieback Levees; construct four pump stations S332A, B, C, and D; replace the SR 9336 bridge over Taylor Slough; and remove spoil mounds along the southern leg of C-111; and fill Canal 110 and Canal 109.

In April 1995, the East Everglades 8.5 Square Mile Area Study Committee submitted a report to the Governor of Florida. 8.5 Committee. The 8.5 SMA, the committee noted, “was once historic Everglades” and that “portions” of the area are “subject to extensive flooding.” Id. at 1. Furthermore, acquisition of the area “has not been a priority of the state, South Florida Water Management District or Dade County.” Id. at 3. The Committee rejected the GDM’s flood mitigation project, as it is “a very costly approach to maintaining the status quo. . . [It] would likely create conflicts between the needs of residents and the needs of the natural system while not resolving flooding problems” of the 8.5 SMA. Id. at 20. Instead, the Committee proposed a “flow-way/buffer” to provide “flood protection for developed areas” within the 8.5 SMA and recommended that it be considered as a “Locally Preferred Option for the Corps flood mitigation project.” Id. at 23.

In October 1995, the Corps issued a final environmental assessment on Test 7 of the Experimental Program. Corps, Environmental Assessment, Test 7 (1995)(Exhibit 24).

The test continued "without change" the plan of water deliveries to the Park in Shark Slough through the S-12 structures, as described in the Test 6 EA and as carried out under Test 6 Extended. EA at 7-8. Water deliveries to the Park at Taylor Slough would be changed to a plan of maintaining water levels in the L-31W canal between S-174 and S-175 based on a rainfall/canal stage formula developed by the Park. Id. The maximum stage in the L-31W canal would initially be capped at 4.7 feet, with the minimum allowable stage at 3.0 feet, and there would be no artificial drawdown procedures for the canal. Id. at 8. The 500 cfs flood conveyance capability of the L-31W canal would be maintained in two phases. In Phase 1, the maximum operational state in the tailwater of S-174 would be restricted to 4.7 feet, and S-332 would be used to pump up to a maximum of 495 cfs into Taylor Slough when the rainfall formula called for a higher stage in the L-31W canal. The east-west canal south of S-175 would be plugged to reduce eastward movement of water from Taylor Slough towards C-111, and a new pump station with a capacity of 500 cfs would be constructed in the vicinity of S-174. Id. Lands "abutting the northernmost reach of the L-31W that have been authorized for acquisition. . . would have to be purchased before Phase 2 could be fully implemented." Id. at 8. In Phase 2, the new pump station would be used to force flood flows through the L-31W canal when needed. The cap on the L-31W canal state would be eliminated, pumping at the S-332 would be minimized, the low berm along the western side of the canal north of S-332 would be degraded, and the L-31W would be plugged in several places south of S-175 to minimize flow south. Id. at 8-9. In addition, two new small capacity pumps would be installed at S-173 to allow "more efficiency of operation when

attempting to hold a constant stage upstream during pump-down for flood mitigation of S-333 water deliveries to NESRS.” Id. at 9.

Under Test 7, the 8.5 SMA “will be provided with flood mitigation as authorized under the Corps 1992 GDM. . . .” Id. at 16. A footnote explained that the “flood mitigation plan is designed to prevent any increase in the frequency and severity of flood damages relative to the existing condition. It is not the same as flood protection, which would be designed to reduce the frequency and severity of flood damages relative to the existing condition.” Id.

In response to comments that Test 7 was not significantly different from Test 6 and that it would continue to reduce the value of the area to species such as the sparrow, see, e.g., Letter from Craig Johnson, Fish and Wildlife Service (“Service”), to A.J. Salem, Corps, id. at Appendix H, the Corps noted that it “is not reasonable to expect that the restoration goal of the Experimental Program can be approached in a significant way until the authorized structural changes in the Project have been constructed.” The Florida Game and Fresh Water Fish Commission, voicing concerns similar to the Service, questioned the intent of the experimental program, and noted that if its intent “is to balance restoration with development interests, the continuing decline of ENP ecosystems during the Experimental Program suggests that too much weight has been placed on development interests during the previous six test iterations.” Id. In response, the Corps noted that the experimental program is “constrained at this stage by the need to avoid significant adverse impacts to development interests in the area.”

The Corps stated that "predicted water level differences may influence Cape Sable seaside sparrow Critical Habitat, but the nature and extent of this could not be well understood from the hydrologic model outputs." The Corps noted that Test 7 "would be in accord with provisions of the ESA" because the Corps "would implement all the alternatives and actions specified in the B.O. to avoid jeopardy and minimize incidental take of the sparrow." EA at 21.

In October 1995, the Service issued a biological opinion on Test 7. 1995 BO. The Service noted that the "most profound adverse effects of Test 7, like Test 6 before it, are related to the amount of water delivered to western Shark River Slough versus northeast Shark River Slough." Id. at 17. Water level constraints in the L-29 canal downstream of S-333 and the trigger well criteria (G-3273 and Angel's Well) limited water deliveries into the northeast Shark Slough; because of these constraints, water deliveries through S-333 were suspended from August 1994 to mid March, 1995. Id. After noting that Test 7 would continue the Test 6 water delivery schedule to the Shark Slough, the Service stated:

If the constraints in the Levee 29 canal and the trigger well criteria have the same effect on water deliveries into northeast Shark River Slough during Test 7 as they did during test 6, the environmental effects should be the same. Consequently, regulatory releases into western Shark River Slough and the water depths that result should not be significantly different from the patterns observed during Test 6. Regulatory releases into the marl prairies west of Shark River Slough during Test 7 can be expected to continue to exceed the 45 percent target level set for the test. Similarly, flows from Water Conservation Area 3A into northeast Shark River Slough should not be significantly different from the patterns observed during Test 6. Consequently, discharges into northeast Shark River Slough should remain below the 55 percent target level set for the test.

Id. The Service also noted the adverse effects of Phase I, Test 7 on the sparrow, stating that water levels in the northern Taylor Slough “would degrade the quality of Cape Sable seaside sparrow habitat in that basin by allowing woody plants to become more established in that basin.” Id. at 18. Thus, until “the cap on stages in the Levee 31 North Canal are lifted in Phase II of Test 7, surface water flows across the Rocky Glades and into Taylor Slough would still be lost. This would allow woody plants to continue to establish themselves in this region.” Id.

The Service noted that one of the “critical subpopulations” of the sparrow,⁴ found west of the Shark River Slough, “appears to have been virtually extirpated by regulatory discharges into the peripheral wetlands west of Shark River Slough that produced high water levels in the breeding habitat,” and these high water levels “have effectively precluded successful reproduction in that subpopulation.” Id. Two of the other subpopulations “were adversely affected when reduced hydroperiods in the northern Taylor Slough wetlands allowed these areas to succeed to woody plants.” Id. The population had been reduced to a single, stable subpopulation in the Mahogany Hammock area, and the longer that species is represented by that single population, the greater the probability that this subpopulation will be exterminated by a random event like a fire, hurricane, or outbreak of disease. If the Mahogany Hammock population is extirpated, the subspecies “will probably become extinct.” Id.

⁴ This subpopulation was later designated as subpopulation A. The Mahogany Hammock area population is subpopulation B. The two other subpopulations referenced in this paragraph are C and F.

The Service concluded that Test 7 “is likely to jeopardize the continued existence of the Cape Sable seaside sparrow.” Id. at 20. In addition, the Service noted that “[d]egradation of critical habitat over the last 10 years” has “appreciably diminished its value for both the survival and recovery” of the sparrow. Id. While Phase 1 was not “likely to appreciably improve these conditions,” Phase 2 “should help reverse the degradation” and the Service therefore concluded that the proposed action was not likely to adversely affect sparrow critical habitat. Id.

The BO identified a reasonable and prudent alternative that consisted of five actions. Id. at 20-21. One of the actions was that the Corps, with the cooperation of the Service and National Park Service (“Park Service”), should “develop a plan that identifies remedial actions and management interventions that could be taken if the status of the Cape Sable seaside sparrow declines during Test 7.” Id. at 21.

The Water Resources Development Act of 1996, Pub. L. No. 104-303, 110 Stat. 3659 (“WRDA”), made several important modifications to the Project. Section 316 authorized the Secretary of the Army to implement improvements to the Canal 111, including acquisition by non-federal interests of such portions of the Frog Pond and Rocky Glades as are needed for the project. Section 528(b)(1)(A)(i) provided that the Secretary “shall develop, as expeditiously as practicable, a proposed comprehensive plan for the purpose of restoring, preserving, and protecting the south Florida ecosystem.” The plan “shall provide for the protection of water quality in, and the reduction of the loss of fresh water from, the Everglades.” Id. The plan also shall include features to provide for flood control, the enhancement of water supplies, and other objectives served by the

Project. Id. WRDA specifically notes that in carrying out these activities, the Secretary “shall comply” with the ESA. Id. at § 528(b)(4)(B).

In 1996, an expert panel issued a report that reviewed the effects of high water in the Everglades during 1994-95. 1996 Peer Review. This report stated that water control structures were completed in and around WCA 3A in the late 1960s “dramatically altered the spatial distribution of water flow southward under the Tamiami Trail... The historical channel through which most of the water flowed into the southern Everglades, the Northeast Shark River Slough, currently receives little (during normal flows) or no (during high flows) water from north of the Tamiami Trail.” Id. at 17. The L-67 Extension and the placement of the S-12s have “increased both the magnitude of the flood releases to West Shark River Slough and the drying of Northeast Shark River Slough.” Id.

The sparrow, the panel noted, “appears to have relatively strict requirements for reproductive success, which limit it to small patches of suitable habitat. S. Pimm’s studies confirm what earlier work has suggested – Cape Sable sparrows cannot breed successfully without a minimum of 40 days of continuous dry conditions in their ‘wet prairie’ habitat; good reproductive output requires at least 60 consecutive days.” Id. at 11-12. Discussing the *Muhlenbergia* vegetation, the expert panel observed that the “major losses of this habitat result from diverting to the west most of the water entering the Park, resulting in excessively long hydroperiods between 1993 and 1996 in the West Shark Slough area and unnatural hydroperiods and fire regimes in Northeast Shark River Slough and Upper Taylor Slough areas.” Id. at 12. These conditions, if allowed to persist,

the Panel concluded, "clearly threaten the existence of the Cape Sable sparrow because of its dependence on a specific habitat type. If the sparrow becomes extinct, it will be because an entire community of the Everglades system was allowed to disappear." Id.

In May 1997, the Service transmitted "the final draft of the Remedial Action Plan" for the sparrow to the Corps ("Service RAP"). Letter from Craig Johnson, Service, to Dr. Hanley K. Smith, Acting Chief, Planning Division, Corps (May 21, 1997). The Service asked the Corps to receive any other comments and finalize the document. The Service RAP proposed "category one" actions "that must be implemented as soon as possible and will lay the groundwork for future remedial actions" and "category two" actions which "will be implemented if the status of the population declines." Id. at 9. One item was that the Corps "should gap the L-67 extension at one mile intervals or expedite this component of the Modified Water Deliveries Project and completely remove the levee." Service RAP at 11.

In late 1997, the Service and Park Service published the Balancing on the Brink Report, which summarized the jeopardy situation facing the sparrow and reviewed actions to remove this status. Department of Interior, Balancing on the Brink: The Everglades and the Cape Sable Seaside Sparrow (1997)("Balancing on the Brink") (Exhibit 25). This report reviewed how the Project had modified historical patterns of water delivery to the Shark Slough and Taylor Slough. This report reiterated the need for the Corps to adopt the Service RAP, ominously noted the existing status of the sparrow, and stated that if the Ingraham population experiences one catastrophic event, "extinction is almost certain for the Cape Sable seaside sparrow." Id. Based on population models,

the sparrow, the Service and Park Service state, will become extinct within two decades if current trends continue. Id. at 13.

The Service, in a November 1997 letter to the Corps, stated that the Service "continues to believe the actions delineated in the RAP are those actions necessary to prevent the extinction of the sparrow in the short term." Letter from Craig Johnson, Supervisor, South Florida Ecosystem Restoration Office, to Col. Miller 7 (November 18, 1997). However, the Service went on to note that Corps staff have stated that "some of the actions in the RAP fall outside your authority to implement and that they cannot be accomplished in the short term. Despite our concerns for the sparrow, we are no longer asking you to immediately implement the actions in the RAP (such as the L-67 extension) that would result in flooding private lands. However, we believe these actions will be critical in the next two to three years." Id. In making this statement, the Service apparently believed that the District "could have a plan for full acquisition of the 8.5 SMA completed within 6 months, or by March of 1998; this process would "not only prevent the sparrow's extinction, but effect its recovery within two to three years." Id. The Service also asked the Corps to support "a plan for full acquisition of the 8.5 SMA," because the "best scientific information available indicates that removing the L-67 Extension Levee and rerouting flows through Water Conservation Area 3B into northeast Shark River Slough must occur to solve problems for the Cape Sable seaside sparrow." Id. at 8. In addition, the Service noted that "modeling" has indicated that the "removal of the southern portion of the levee will not significantly increase water levels within the 8.5

SMA" and the Service saw "no reason to wait" until full acquisition to begin removing portions of the levee. Id.

On December 24, 1997, the Service and the Park Service wrote the Corps to "request immediate, remedial, substantive and temporary modifications to the Experimental Water Deliveries Program to Everglades National Park." Letter from Steve Forsythe, State Supervisor, Service and Richard Ring, Supervisor, Park, to Colonel Joe Miller, Corps 1 (December 24, 1997). The Service and Park Service noted that "recent maximum flood releases through the S-12s, which occurred from June 6 to October 24 of this year, have created abnormally high water conditions over the sparrow's western habitat." Id. at 2. The agencies "cannot concur with actions that increase the risk of an unsuccessful nesting season, such as increasing regulatory releases onto the western habitat above current levels. Furthermore, the most desirable actions are those which reduce the S-12 releases to zero, which minimizes the risk of flooding during the nesting season." Id. at 3.

In a letter dated January 15, 1998, the Service, with certain changes, "accept[ed] finalization of the RAP." Letter from Stephen Forsythe, State Supervisor, Service, to John R. Hall, Acting Chief, Planning Division, Corps. However, the Service stated:

[S]ince completion of the Test 7 biological opinion, we have identified significant new information that was not available when we prepared the opinion. This new information (1) further supports the jeopardy conclusion reached in the Test 7 biological opinion, (2) stresses the need for immediate action to reduce adverse affects on both the sparrow and its habitat, and (3) suggests that the reasonable and prudent alternatives in the 1995 Biological Opinion did not include enough measures to avoid the likelihood of jeopardizing the Cape Sable seaside sparrow.

Id. at 1-2. The Service stated that to "address this new information, we separately asked you to reinitiate consultation." Id. at 2.

On January 28, 1998, the Corps issued a draft environmental assessment on the proposed deviation from Test 7. Corps, Emergency Deviation from Test 7 of the Experimental Program of Water Deliveries to Everglades National Park to Protect the Cape Sable Seaside Sparrow" (1998)("DEA"). The "primary objective" of the actions in the DEA, according to the Corps, "is to prevent or minimize the discharge of water from WCA 3A through the S-12s that would increase the depth of surface water in the sparrow's western habitat, or slow its recession, during the period extending through the 1998 breeding season." Id. at 2.01. The Corps adopted measures that would move waters east to the estuaries and measures that would allow additional water to be stored in the water conservation areas. The Corps implemented a "temporary emergency deviation in the WCA 3A water regulation schedule" which would "allow water levels to rise higher before the S-12s are used to attempt to curtail the rise." Id. at 2.07. Under the DEA action, structures 12C and S-12D, the two easternmost structures, "are partially open, discharging at 350 cfs and 700 cfs, respectively, as of December, 24th." Id. at 2.05.

The DEA rejected use of the S-333 and breaching the L-67 Extension, measures which the Service again urged. See DEA at 2.11, 4.03-4.04. The Corps stated that actions which would "move water into NESRS, thereby flooding private property, are not within the authority of the Corps to implement at this time." Id. at 4.04. However, in response to questions about the purported "flooding" that were asked at a public workshop on the DEA in February 1998, the Corps and the District were not able to state

how many inches the water would increase in the 8.5 SMA, or where the increase would occur in the 8.5 SMA.

During January, the Corps, Service, and other agencies held a series of conference calls regarding the emergency measures. The BLF understands that during the calls, the Service informally consulted on the proposed actions and offered recommendations to minimize the effects of the emergency response actions. The participants felt that until the emergency was over, the Corps was covered under 50 C.F.R. § 402.05 for all species that may be affected by the DEA emergency measures, and that the Corps and Service would complete an after-the-fact consultation for adverse effects to snail kites, wood storks, and sparrows.

The Corps, on February 9, 1998, sent the Service “[t]he final RAP adopted by the U. S. Army Corps of Engineers” Corps, Remedial Action Plan (1998)(“Corps RAP”). Like the Service RAP, the Corps RAP listed category one actions, which “must be initiated by March, 1998 and will lay the groundwork for future remedial actions” and category two actions. *Id.* at 8. However, there are significant differences between the Service RAP and the Corps RAP. For example, despite the Corps’ knowledge that removing the L-67 extension would benefit the sparrow, see DEA at 1.06 (“Removal or breaching of L-67 Extension would greatly reduce the impacts on the sparrow’s western habitat from discharge out of these [S-12] structures.”), the Corps RAP states:

The COE [Corps] should provide hydrologic modeling necessary to study the effects of incremental reductions in the L-67 Extension on stages in the 8.5 SMA for given design discharges from existing WCA 3A control structures. Model results would be used to assist in the determination of the extent of lands to be acquired in the 8.5 SMA and NESRS under given alternative reductions in the L-67 Extension.

Id. at 9. The “category two” action states that the Corps should begin removing portions of the L-67 Extension and filling the adjacent borrow canal as sufficient land is acquired by the District and Department of Interior (“DOI”) “to prevent flooding any unaquired private lands.” Id. Thus, while the Service RAP required the gapping of the L-67 extension at one-mile intervals or its removal, the Corps RAP would only remove portions of the levee after land is publicly acquired in order to prevent increased water levels on any private lands. This limitation could prevent the gapping of the L-67 extension for years.

On February 13, 1998, the District, Corps, Park Service and Service signed a “Cooperative Agreement” regarding the Endangered Species Act (“ESA”) consultation. The agreement stated that “OBSERVING the information contained in the Final Environmental Assessment prepared by the U.S. Army Corps of Engineers entitled ‘Emergency Deviation from Test 7 of the Experimental Program of Water Deliveries to Everglades National Park to Protect the Cape Sable Seaside Sparrow,’”⁵ it was agreed that to “manage seepage water from Water Conservation Area 3B, and to reduce water levels in Water Conservation Area 3A, waters shall be discharged by the District through the South Dade Conveyance System” in accordance with the agreement’s criteria. Furthermore, the District and Corps “have taken this action based upon informal consultation with the FWS” and that the parties “agree that this emergency action is

⁵ While the Cooperative Agreement refers to a “Final” EA, as of the date the document was written, only the DEA had been released to the public. The final EA was released in 1999.

Given this information on the Modified Water Deliveries as well as the GDM results, we see three possible operational strategies for this Project during wet conditions:

- Remove the L-29 constraint, allowing the Tamiami Trail to flood. This will reduce flooding damages in WCA 3B, improve Northeast Shark Slough, and western Shark Slough.
- Retain an L-29 constraint, allowing no damage to Tamiami Trail. This will help western Shark Slough, severely damage WCA-3B, and have some small benefit for Northeast Shark Slough.
- Not operate S-345, S-333, and S-3[55] during wet periods.⁶ This does not result in damage to WCA-3B or Tamiami Trail, but does not change the current problems in western Shark Slough and Northeast Shark Slough.

Id. at 145, 147. Because of the elevation of the Tamiami Trail, Mod Waters cannot be implemented in a manner that significantly improves flows into northeast Shark Slough without placing water on portions of the road or damaging the road due to the destabilizing effect of high water levels.⁷ Thus, assuming that the Corps does not want water to affect traffic on the road, the Corps will not implement Mod Waters until the Florida Department of Transportation raises portions of the road. In turn, the sparrow will continue to remain at risk.

In addition, it is important to note that even if Mod Waters were fully implemented and providing the benefits to the sparrow, such a status should not be equated with full "restoration" of flows. While Mod Waters "substantially decreases S-12

⁶ The text of the report repeats S-345 twice due to a typo; the corrected reference would read "S-355."

⁷ The BLF understands that in the future, the Corps will be reevaluating Mod Waters, and considering whether to make changes. Of course, it is not clear at this time what, if any, changes will be proposed, or how long it will take to implement those changes.

discharges relative to the 1983 base and Test 7 in all but the wettest years,” the “target 45-55% distribution appears to be achieved only during average or below average rainfall conditions.” *Id.* at 136. “During wet periods,” the report notes, “which account for the bulk of the flow volumes in the Everglades, almost the entire flow into Shark Slough enters through the S-12 structures, the same as the 1983 Base Condition and the situation today. So, rather than passing the desired 55 to 70% of the total discharge into Northeast Shark Slough during wet periods, Modified Water Deliveries passes almost 100% into western Shark Slough, which represents no improvement...” *Id.* at 134. While Mod Waters theoretically provides benefits to the sparrow, the Petitioners cannot say, based on the available scientific information, that adverse impacts to the sparrow actually will be removed, or that the degraded habitat will be fully restored.

On February 19, 1999, the Fish and Wildlife Service finalized the biological opinion on Mod Waters, the C-111 Project, and the Experimental Program. 1999 BO. In discussing the effects of the Experimental Program on the sparrow, the Service noted that the “major effect on Test 7, like the tests before it, is the concern for flooding of private lands adjacent to ENP. During storm events, flood control criteria override normal operations established for the test. Other constraints include ecological concerns and structural limitations for water levels in the WCAs.” *Id.* at 14. The Service further observed that the goal of Test 7 is to deliver 45% of the water deliveries to Shark Slough through the S-12s and 55% of the total through S-333; however, “if S-333 is closed or discharging less than 28% of computed flows, the guidelines for the Experimental Program allow, and in some instances require, the S-12 Structures to discharge between

73 and 100 percent of the computed flows from WCA-3A. The constraint on the use of S-333 involves flowing water over private lands and the Tamiami Trail roadbed." Id. at 15.

Because of the considerable importance of the 1999 BO, this Petition provides an extended excerpt that discusses in detail the effects of Test 7 on the sparrow:

As proposed, the Test 7, Phase II, operational schedule for water release into Shark River Slough is consistent with previous test iterations dating back to 1985, starting with Tests 1-5, continuing in 1994 with Test 6, and followed by Test 7, Phase I in 1995. Like the previous test iterations, the concern with Test 7 is the impact of managed water releases through the S-12 spillways into the western marl prairies and it's [sic] potential effect on the breeding habitat and behavior of the Cape Sable seaside sparrow within core subpopulation A. Precipitation in combination with managed water releases through the S-12 spillways determine the extent water levels affect the birds directly, by flooding their nests, and indirectly by altering the nesting habitat on which they depend. The amount of water released through the S-12s that will preclude nesting is correlated to: (a) the existing water table level prior to the nesting season and (b) the amount of breeding season rainfall that occurs. There is no consideration in the operational water delivery schedule to sparrow nesting habitat conditions below the S-12s prior to regulated water release. Therefore, the proposed water delivery schedule is anticipated to result in continued adverse effects to the Cape Sable seaside sparrow in subpopulation A during those years when managed water releases will: (1) flood the marl prairies of western Shark River Slough during the sparrow nesting season, whereby unsuitable nesting habitat conditions would be created that effectively preclude successful reproduction (Nott *et al.* 1998); and/or (2) by flooding occupied nesting habitat that results in mortality of eggs or chicks, due to nest flooding, or increased predation (Nott *et al.* 1998). The rationale for these determinations is provided below.

As noted earlier, the sparrow nesting season typically begins as early as mid-March and ends with the onset of the wet season, which can be as late as August. For modeling purposes, the beginning of the sparrow nesting season was defined as March 15, and the beginning of the wet season has been defined as July 1. The sparrow will not commence nesting activity if water levels over the nesting habitat have not receded below 10 cm, and needs a minimum of 40 consecutive days to complete one breeding cycle; they will successfully fledge two clutches if provided at least an 80 day nesting period (Nott *et al.* 1998). Therefore, one important hydrologic measure for potential sparrow nesting success is to determine the number

of consecutive days between March 1 and July 15 that water levels are below 10 cm within nesting habitat. In applying this principle to modeling output that shows the water level at a fixed point such as NP 205, it is important to note that, due to topographic variation within the sparrow's habitat, habitat at a higher elevation than the reference point will remain dry for longer than habitat at or below the reference point elevation. Therefore, for example, a water management scenario that would provide water levels at or below a particular reference point for 60 consecutive days would actually provide the 80 dry days required for completion of two successive broods over much of the habitat at a higher elevation.

The inference from the model simulations provided by Van Lent et al (1999) is that approximately 60 percent of the time one can expect water levels to be below 10 cm for at least 40 consecutive days during the nesting season. Viewed another way, in 6 out of every 10 years we can expect the water level to be adequate for the sparrow to complete one breeding cycle. Furthermore, the modeling results indicate the sparrow could complete two broods in only 5 out of every 10 years. In determining what effect this has on the sparrow, it is necessary to consider if such a breeding frequency is outside of natural variability.

Reviewing hydrologic conditions during the 20 year period from 1977 through 1996, Nott *et al.* (1988) collected data at a hydrological monitoring index station (NP 205) that was considered by the authors as representative of the sparrow's western marl prairie nesting habitat. They also collected data from a rainfall monitoring station close to the S-12A spillway along with daily water release data for the S-12 structures. These data reflect that over the 20 year period, there were 9 years with an insufficient number of dry days during the breeding season for the sparrow to complete one brood. During these 9 years, water was released through the S-12A spillway and the flow ranged from 213 to 2,063 cm/acre/day. There were only two exceptions: (1) In 1980 when there was no regulatory water release through S-12A, however over 15 cm of rainfall fell during the breeding season and only 42 percent of the habitat was available to complete one brood; and, (2) In 1996 when there was no regulatory water release through S-12A, however 13 cm of rainfall fell during the breeding season and only 33 percent of the habitat was available to complete one brood. There were only 4 years over this 20 year period with higher rainfall during the breeding season that occurred in 1996. Conversely, during the 11 years that at least 40 dry days were available during the breeding season for the sparrow to complete one brood, regulatory water release was relatively low (0.59 to 55.16cm/acre/day). During these 4 years, mean breeding season water level ranged from 7.15 to 61.77 cm below mean sea level and in 3 of the 4 years the habitat available to

complete one brood was above 93 percent; the exception was in 1988, where, due to high breeding season rainfall (over 6 inches), only 63 percent of the habitat was available to complete one brood. It is clear that both local rainfall and discharges from the S-12s impact the water levels at NP 205.

The Van Lent et al. (1999) model predicts that if conditions remained the same, 12 out of every 20 years the water level should be adequate to complete one brood. The data set of actual, observed conditions analyzed from Nott *et al.* (1998) reflects that, indeed, in 11 of the past 20 years the nesting habitat conditions were adequate for the sparrow to complete one brood. However, regulatory water releases occurred during 4 of those years and the actual releases had a relatively low volume flowing through the S-12A spillway (mean of 22 cm/acre/day). During the 9 years when the nesting habitat conditions were inadequate for the sparrow to successfully complete one brood, water releases through the S-12A spillway were considerably larger (mean of 1,040 cm/acre/day). Our conclusion is consistent with the observation of Van Lent and Pimm (1988), that the opening of the S-12 spillways is the single most important factor in predicting nesting success. Continued high flows across the S-12s in combination with a high water table across the nesting habitat and high breeding season rainfall expected under natural rainfall patterns would likely lead to the loss of the western population as a core area.

The loss of one core population breeding season is detrimental, but the loss of consecutive nesting seasons for the Cape Sable seaside sparrow could be critical for its long-term survival. Initiated in 1995, Test 7 is to run for four years. As concluded by Nott et al. (1998), the relatively high water levels in 1994-1996 kept subpopulation A suppressed; one of only two remaining core populations for the sparrow. Nott *et al.* (1988) noted that since the annual survival of territory-holding males is about 50 percent, four years without breeding would have left few individuals that lived long enough to see the relatively dry year of 1997. Subpopulation A has now remained suppressed for the past 4 consecutive years due to the flooding of their nesting habitat during the breeding season. Furthermore, both Nott et al. (1998) and Curnutt et al. (1998) document the long-term potential adverse effects of sustained long hydroperiods on the vegetative composition of Cape Sable seaside sparrow nesting habitat.

The sparrow occupies marl prairies dominated by muhly grass or mixed prairies with plant characteristics of short hydroperiods, avoiding longer hydroperiod vegetative communities where plants such as sawgrass (*Cladium jamaicense*) are the dominant species. In both the eastern and western marl prairies, increased water levels similarly changed the

vegetation from muhly to sawgrass dominated and so caused the sparrow population to decline (Nott *et al.* 1998). Moreover, with fewer places available to construct nests, vegetational changes have consequences much greater to the sparrow than ephemeral flooding. Sustained hydroperiods across the western marl prairies would alter vegetational composition such that it would eliminate suitable nesting substrate. Without available nesting habitat across the western marl prairies, the loss of subpopulation A would be imminent.

Since the environmental baseline conditions of 1995, when subpopulation A totaled 224 birds, the numbers increased to 416 birds in 1996, this increase was likely the result of the minimal regulatory water releases through the S-12s, but then declined to 272 birds in 1997 and 192 birds in 1998. By 1997 the number of core individuals in this core area had dropped to less than 10 percent of its highest recorded numbers since surveys were initiated in 1992. In a risk assessment analysis conducted by Pimm (1997), his simulation modeling determined that if current conditions persist the western population of the sparrow will be lost within 10 years. Van Lent and Pimm (1998) note that another unsuccessful nesting season, the fifth in six years, could result in the loss of subpopulation A, which in turn would lead to a high risk of extinction for the Cape Sable seaside sparrow.

Test 7, Phase I, is anticipated to result in the continued decline in the eastern Cape Sable seaside sparrow subpopulations and further deteriorate suitable nesting habitat conditions. This decline is related to over-drainage and the resultant shift in the vegetative community, which increases the frequency of fire such that it becomes detrimental for sparrow breeding (Pimm 1997). Nott *et al.* (1998) and Curnutt *et al.* (1998) attribute declines to over-drainage and resultant fire frequencies in the areas of subpopulations E and F and almost all of subpopulation C located upstream of S-332, along with flooding that eliminates suitable nesting substrate in the southern part of subpopulation C, located immediately downstream of S-332. These vegetation changes, in turn, are directly related to the hydroperiod, or the number of days per year a marsh is flooded (Van Lent *et al.* 1999). Therefore, another important hydrologic measure to determine the effects of the Experimental Program on the Cape Sable seaside sparrow is the hydrologic regime required to maintain the eastern wet prairie habitat.

The proposed Test 7, Phase II operational schedule for water deliveries to Taylor Slough is predicted to result in slight increases in water levels in the eastern marl prairies compared to the 1995 environmental baseline condition (Van Lent *et al.* 1999, Corps 1995). Water management

operations proposed in Test 7, Phase II, include higher L-31N canal stages and provisions for increased wet season water deliveries to Taylor Slough as compared to those in Test 7, Phase I. Specifically, model runs predict slightly higher water levels in the areas occupied by subpopulations C, E and F and slightly lower water levels in the area of subpopulation D (Van Lent et al. 1999). The Service expects this may result in slight reductions in expected fire frequencies in the areas of subpopulations C, E, and F, which may slightly reduce the extent and duration of unsuitable habitat conditions for sparrows due to frequent fires.

Test 7, Phase I, continues diverting water to the west creating more xeric habitat conditions in the area of subpopulation E, which likely contributed to its decline from 352 birds in 1995 to 192 in 1996. However, subpopulation E has shown an increase to 752 in 1997 and 912 in 1998. This positive trend is expected to continue with the implementation of Test 7, Phase II, as the projected higher water levels across this area approach conditions that resemble more natural water flow conditions that existed prior to the Experimental Program (Van Lent et al. 1999). These slightly higher water levels should restore a more mesic prairie habitat condition that is conducive for sparrow nesting. Such conditions should benefit the sparrow by increasing the potential to produce more young. With an increased probability of establishing nesting territories, sparrow numbers are anticipated to increase slightly in this area.

Declines in subpopulations C and F are thought to be the result of over-drainage, which created drier conditions resulting in woody shrub invasion into prairie nesting habitats followed by frequent burns (Curnutt *et al.* 1998). In their analysis of historic fire patterns in ENP from 1982 to 1996, Curnutt *et al.* (1998) determined that longer intervals between fires increase sparrow numbers, for at least 10 years, and that infrequent fires may be necessary to maintain suitable sparrow habitat by removing dense prairie debris and the undesirable woody shrub component. Furthermore, observations of vegetative changes near the existing 332 pump station (Armentano *et al.* 1995) suggest that pumping at S-332D, and/or continued pumping at S-332, would result in further vegetation shifts from *Muhlenbergia* dominated communities preferred by sparrows to undesirable sawgrass dominated communities in the immediate vicinity of these pumps (part of subpopulation C). Unsuitable habitat conditions further eliminate nesting opportunities and would limit the reproductive potential of subpopulations C and F. After the apparent local extinction by 1995, subpopulation C increased to an estimated 48 birds in 1996 and 1997 and to 80 birds in 1998, while the estimate for subpopulation F has remained at 16 birds since 1996. As of this writing, the Corps has not made a decision on detailed operational criteria for S-332D and S-332, and

highly detailed modeling results describing the hydrological effects of the operational options now under consideration are not available. Available results from the Van Lent et al. (1999) modeling give only a general indication of the expected water level changes in this area. A precise description of the nature and extent of vegetation shifts resulting from S-32D and/or S-332 operations and, therefore, the precise effects such shifts may have on the Cape Sable seaside sparrow remain speculative.

Unlike the western marl prairies, the concern with subpopulations C and F is not the flooding of nesting habitat, but the diversion of natural water flow to the west, causing drier habitat conditions, invasion of woody shrubs, and frequent fires that preclude the birds from successfully reproducing. Although water levels in the northeastern portion of the sparrow's range, occupied by subpopulations C and F, will increase slightly from the 1995 environmental baseline condition (Van Lent et al. 1999), this slight increase is not anticipated to appreciably reduce the fire frequencies or cause a vegetational shift to a more muhly grass or mixed prairie vegetative community preferred by the sparrow for nesting. Such a vegetation shift is necessary to reestablish the eastern core population and reduce the potential for extirpation from a single catastrophic event.

In recent years, subpopulation D experienced an increase in hydroperiod during the nesting season, with resultant decrease in available nesting days, as a consequence of increased water conveyed south through C-111 during Test 7, Phase I (Van Lent et al. 1999). These effects occurred coincident with, and were almost certainly caused by the original dredging of the L-31N canal and subsequent flood control operations of Test 7 Phase I that held stages in L-31N and L-31W low enough to cause drainage of water from the areas of subpopulations E and F and part of subpopulation C (Kushlan *et al.* 1982, Nott *et al.* 1998). The subsequent increased pumping at S-332 resulted in higher water levels and a longer hydroperiod in a part of subpopulation C and subpopulation D located downstream. Consequently, subpopulation D was considered extirpated by 1995, rebounding to an estimated 80 birds by 1996, but declined to only 48 birds in 1997 and 1998. Implementation of Test 7, Phase II, will result in slightly lower water levels across the downstream area of subpopulation D, possibly increasing available nesting days, resulting in beneficial effects by increasing the potential to produce more young. With an increased probability of multiple broods, sparrow numbers are anticipated to increase slightly in this area.

In the area of subpopulation B, in the central portion of the sparrow's range, the proposed operational schedule for the Experimental Program is not predicted to result in any significant change to the hydroperiod

compared to the 1995 environmental baseline condition (Van Lent et al. 1999). This area is far enough away from the water control features that it remains unaffected by the operational water delivery schedule (Van Lent et al. 1999). Subpopulation B had an estimated 2,048 birds in 1995 and 1996, and increased to 2,784 birds in 1997, but decreased to 1,792 birds in 1998.

Although Test 7, Phase II will slightly increase water levels in subpopulations C and F, these increases will not be sufficient to substantially improve hydroperiods (Van Lent et al. 1999). Therefore, implementation of test 7, Phase II, like Phase I, will continue to adversely modify designated critical habitat occurring in the areas of subpopulations C and F by facilitating shortened hydroperiods that result in the invasion of undesirable woody shrubs and increased fire frequencies and a change in the vegetative community from muhly grass to sawgrass dominance. Part of the critical habitat downstream of S-332 and S-332D will also be adversely modified through increased hydroperiods due to pumping at those structures that will cause a shift from Muhly dominated to sawgrass dominated habitat. Over time, this habitat alteration will effectively eliminate the available nesting substrate in these areas causing an appreciable reduction in reproductive capability, numbers of birds, and distribution across the eastern portion of the sparrow's range. The condition of critical habitat in the area of subpopulations D and E are anticipated to improve slightly. Due to its location, critical habitat located in the area of subpopulation B would not be affected and no critical habitat is designated in the area of subpopulation A.

In summary, regulatory water releases through the S-12 spillways provide too much water to the western side of Shark River Slough, flooding available nesting habitat during the nesting season, causing declines in the western sparrow subpopulation. Current (Test 7, Phase I) and proposed (Test 7, Phase II) managed water releases also provide insufficient flows to the eastern side of Shark River Slough that create drier habitat conditions, unsuitable nesting substrate, and recurrent fires which preclude successful reproduction. Additionally, flood control operations near the headwaters of Taylor Slough overdrain the northeastern areas facilitating an adverse alteration in vegetative composition and increased fire frequency, while concurrently providing too much dry season water to part of the southern downstream areas. The results are reduced nesting opportunities and a decline in reproductive effort causing declines in eastern sparrow subpopulations. Simulation modeling conducted by Pimm (1997) predicts that without changes in current water management practices, the Cape Sable seaside sparrow will become extinct within two decades.

Id. at 65-70. After reviewing the current status of the sparrow and its designated critical habitat, and the effects of the Experimental Program, the Service concluded in the 1999 BO that the Experimental Program "is likely to jeopardize the continued existence of the Cape Sable seaside sparrow and adversely modify its critical habitat." Id. at 77.

The Service provided a single Reasonable and Prudent Alternative ("RPA") consisting of nine items for the Experimental Program. Id. at 78-83. The RPA includes the following actions: by March 1, 1999, the Corps must prevent water levels at NP205 from exceeding 6.0 feet National Geodetic Vertical Datum (NGVD) for a minimum of 45 consecutive days between March 1 and July 15. Id. at 78. By March 1, 2000, the Corps must prevent water levels at NP205 from exceeding 6.0 NGVD for a minimum of 60 consecutive days between March 1 and July 15; implement actions that would produce hydroperiods and water levels in the vicinity of sparrow populations C, E, and F, equal to or greater than those that would be produced by implementing Test 7, Phase II; and ensure that at least 30 percent of all regulatory water releases crossing the Tamiami Trail enter ENP east of the L-67 extension. Id. at 80. By March 1, 2001, the Corps must ensure that at least 45 percent of all regulatory water releases crossing Tamiami Trail enter ENP east of the L-67 extension; and by March 1, 2002, the Corps must ensure that at least 60 percent of all regulatory water releases crossing the trail enter ENP east of the L-67 extension. Id. at 81. The RPA contains an "exception" to each of these requirements; whether these exceptions will be narrowly or broadly construed remains to be seen.

On March 8, 1999, the Corps released a document that discusses modifying the Test 7, Phase I operating criteria for the Experimental Program. Corps, Emergency Operations

for the 1999 Cape Sable Seaside Sparrow Breeding Season (1999) ("Deviation"). The Deviation required alternative operations of the C&SF Project, ostensibly in response to high water on the western side of Shark Slough. Changes in criteria included: adding a Zone E1 regulation schedule for WCA-3A, allowing S-331 headwater changes to drop from 4.5 to 3.5 feet, imposing a 5.0 foot tailwater constraint at S-331, lowering the closing criteria at S-332D and S-176 to approximately 4.0 feet, and lowering Angels' well criteria from 5.8 to 5.5 feet. Id.

In a letter dated March 9, 1999, Col. Miller noted that he had "ordered the termination of operations under Test 7 of the Experimental Program of Modified Water Deliveries to Everglades National Park." Letter from Col. Joe Miller, District Engineer, Corps, to Stephen Forsythe, State Supervisor, Service (March 9, 1999). "In its place," Col. Miller stated, "we will implement the series of emergency actions" that are discussed in the deviation document and these actions "will begin to take place on or shortly after March 9, 1999."

In response, on March 10, 1999, the State Supervisor Steve Forsythe of the Service stated:

there is no indication that these actions must be taken to prevent imminent loss of human life or property; and 2) the Army Corps of Engineers (Corps) has been aware of the critical need to modify Test 7 Phase I operating criteria in order to avoid jeopardizing the Cape Sable Seaside Sparrow since the issuance of our October 27, 1995, biological opinion on Test 7 Phase I. Therefore, the stated need for your proposed action was entirely predictable by as much as 3 ½ years ago and your proposed action does not address an imminent threat as defined by Service policy and regulation.

Letter from Stephen Forsythe, State Supervisor, Service, to Col. Joe Miller, District Engineer, Corps (March 10, 1999).

In addition, ENP responded by noting that its analysis of the Zone E1 regulation schedule change suggests that the action "will have no benefit for the protection of the western Sparrow population by delaying S-12 regulatory releases into western Shark Slough at the onset of the wet season." Letter from Richard Ring, Superintendent, ENP, to Col. Joe Miller, District Engineer, Corps 2 (March 12, 1999). The letter also noted that the schedule could "pose a significant threat to the eastern Cape Sable Seaside Sparrow populations, particularly sub-populations C and D." Id. As to the changes in the criteria for the L-31N, L-31W, C-111 Canal and Angels well, ENP noted that the actions "will lower marsh water levels along the eastern portions of ENP, adding to the existing problems over marsh over-drainage and increasing the likelihood of fires.... [N]umerous Corps technical documents have shown that excess water can be safely diverted from WCA 3A into the SDCS without implementing these lowered operational stages." Id. at 3.

Despite the two written requests by the Service, the Corps did not enter into formal consultation with the Service over the effects of the deviation. Letter from Col. Joe Miller, District Engineer, Corps, to Sidney Maddock, Biodiversity Legal Foundation (1999). In addition, at the time the Corps initiated the deviation, it was unclear when it would be suspended. The Corps stated when the deviation was implemented that if the alternative operations are suspended, then operating

criteria "would likely revert to ones similar to those described in Appendix C of the Environmental Assessment for Test 7 of the Experimental Program of Water Deliveries to ENP." Deviation at 3-4 (emphasis added). The precise regulation schedule, however, was not provided at that time.

In April 1999, the Corps published a detailed proposal to modify the CS&F Project. Corps, The Central and Southern Florida Project Comprehensive Review Study Integrated Feasibility Report and Programmatic Environmental Impact Statement ("Restudy"). The Restudy, which has yet to be approved by Congress, is comprised of more than sixty major components, and has an estimated price tag of \$ 7,899,199,000. Restudy at 10-1, 10-41 – 10-45.

One of the proposals of the Restudy involves partial decompartmentalization of WCA 3. This will include the backfilling of the Miami Canal and southern 7.5 miles of L-67A Borrow Canal, removal of the L-68A, L-67C, L-29, L-28, and L-28 Tieback Levees and Borrow Canal, installation of 8 weir structures along the L-67A, and elevation of the Tamiami Trail. Id. at 9-12. However, it is important to point out that the first phase of WCA-3A decompartmentalization is not scheduled to be completed until 1/15/2010, and the second phase is not scheduled to be completed until 1/4/2019. Id. at 10-32. Thus, while the Restudy has the potential to address in part certain problems stemming from the fragmentation and hydrological modifications caused by the S-12s and L-29, the implementation of these modifications will be, at best, 20 years away. Thus, water management activities clearly will continue to jeopardize the sparrow's continued existence for decades to come. In the time that it takes to implement these

modifications, the sparrow could become extinct, unless the Corps, District, Service, and Park Service quickly implement additional conservation measures.

The BLF understands that the Corps, during the summer of 1999, terminated the deviation. In its place, the Corps reverted to the Test 7, Phase I criteria. The BLF also understands that the Corps is in the process of drafting a scoping notice regarding the modifications that will be made to Test 7, Phase I to implement a reasonable and prudent alternative. It is not clear at this time how long it will be before the Corps issues the scoping notice. In addition, it is not clear how long it will be before the Corps implements changes to the current regulation schedule so as to remove the sparrow's jeopardy status. Specifically, it is not clear whether the Corps will implement "emergency" regulatory procedures under an expedited National Environmental Policy Act process or whether the Corps will only modify the regulation schedule after a full blown Environmental Impact Statement has been prepared – which could take years. The BLF is very concerned that the Corps may attempt to utilize the National Environmental Policy Act to delay implementation of regulatory modifications that would prevent another high water threat to the sparrow during the upcoming winter of 1999/2000.

In addition, during the summer of 1999, the District announced that it was suspending the purchase of lands in the 8.5 SMA. This action even applies to willing sellers in the area. This action throws into serious question the timeline for implementing the Reasonable and Prudent Alternative in the 1999 BO, and only further raises concerns that the sparrow will continued to be a high risk of extinction by the actions of the Corps and District. The BLF understands that the Corps is developing a scoping statement to

address through the NEPA process what to do with the 8.5 SMA. Again, as with the modifications to Test 7, Phase I, the BLF is concerned that this process could take years to complete.

As this extensive summary has shown, the threats to the sparrow are not new. Likewise, the knowledge of what has to be done to address these threats has existed for years. However, the Corps' longstanding refusal – since 1995 – to make the fundamental management changes to the C&SF project certainly does not inspire confidence that the Corps will voluntarily comply with the ESA and modify the operation of the C&SF Project in a manner that removes the sparrow's jeopardy status.

VI. DEPARTMENT OF INTERIOR STATEMENTS ABOUT THE INADEQUACY OF CRITICAL HABITAT

The DOI agencies have repeatedly voiced concerns about the adequacy of the sparrow's critical habitat. As early as 1982, scientists from ENP raised questions about the designated boundaries of critical habitat, and the 1983 Service Recovery Plan for the sparrow reiterated these questions. More recently, in the 1999 revision to the sparrow's Recovery Plan, see MSRP, the Service specifically stated that the current critical habitat boundaries are inadequate and should be revised.

The proposed rule to designate critical habitat for the sparrow was published in 1976. 41 Fed. Reg. 28978 (July 14, 1976)(Exhibit 29). The preamble to the proposed rule stated that the sparrow was known to be present in three isolated localities: the Fox Lakes area of Cape Sable; Taylor Slough; and marshes of the Ochopee-Turner River area in Collier County. Id. The Taylor Slough population, the Service noted, occupies the *Muhlenbergia* and *Cladium* prairies, and represented the "largest known population of

approximately 1,900 to 2,800 birds. Id. “Most of the Taylor Slough type habitat is located within the Everglades National Park, where the species is protected.” Id. The Service stated that “habitat alteration appears to be the greatest threat to the race, particularly the destruction of open prairies by invading exotic trees....” Id. The Service also noted that of the proposed area, 8,800 acres were privately owned lands that were located east of ENP and that these lands were threatened by real estate development. Id.

In 1977, the Service published a final rule designating critical habitat for the sparrow. 42 Fed.Reg. 40685 (August 11, 1977), codified at 50 C.F.R. §17.95 (Exhibit 30). In the preamble to the final rule, the Service stated that the designated areas “contain the largest known concentration of the species in the United States, and are the only known areas that currently can be said to support a major viable population.” Id. As to the habitat requirements of the species, while the Service only noted that the “prairie vegetation of these areas appears necessary for the survival of the species.” Id. The Service also stated that “[a]dditional information regarding the present or future distribution of the sparrow could lead to proposed modification of the Critical Habitat delineation.” Id.

Only five years after this rule was published, questions began to be raised regarding its adequacy. ENP biologists Kushlan and Bass noted in 1982 in a report that “[c]ontraction of the population because of the loss of habitat, has rendered parts of the proclaimed critical habitat unsuitable for sparrows. This can be seen by comparing the critical habitat as of 1981

to present distribution of sparrows ... in the East Everglades.” Oron L. Bass, Jr. and James A. Kushlan, Status of the Cape Sable Sparrow 15-16 (1982).⁸

In 1983, in the initial Recovery Plan for the sparrow, the Service also raised questions regarding the adequacy of the critical habitat boundaries. Service, Cape Sable Seaside Sparrow Recovery Plan (1983)(Exhibit 31). The Service noted:

The area included in the presently designated Critical Habitat of the Cape Sable seaside sparrow does not reflect current occupancy or needs of the sparrow. Because of alterations, probably irreversible, parts of the Critical Habitat are no longer occupied by sparrows (Bass and Kushlan in press). Thus, the extent of current critical habitat requires review. We consider essential habitat to be the area presently occupied by sparrows and adjacent habitat which has not been adversely altered by drainage, hardwood invasion, or substrate alteration. Based on the results of a recent survey in the East Everglades (Bass and Kushlan in press), Figure 5 shows the essential habitat of the Cape Sable seaside sparrow as it existed in 1981. Essential habitat must be protected from development and should be managed to protect sparrows. Possible management actions include zoning or purchase and management by appropriate State or Federal agencies.

Id. at 23. The map of the “essential habitat” can be found at Figure 5 of the plan. As shown in the map, the map includes subpopulation A, which exists west of Shark Slough. Thus, 16 years ago, the Service clearly acknowledged the need to revise the critical habitat boundaries, and, through the identification of “essential habitat,” indicated that the boundaries should include the full extent of the habitat historically occupied by subpopulation A, including the adjoining areas.

In 1998, the Service issued a draft revised sparrow recovery plan as part of the “Multi-Species Recovery Plan for South Florida. Service, Multi-species recovery plan for

⁸ Kushlan and Bass repeated this statement a year later. See Kushlan and Bass 1983. While the authors’ names are reversed and the formatting of this second article is different from the first, the text is similar.

the threatened and endangered species of south Florida, Volume 1 of 2, The Species.

Technical/Agency Draft (1998) ("Draft MSRP"). This document provides a detailed justification for the need to revise critical habitat:

The critical habitat, as designated, does not adequately account for the distribution of the present-day core subpopulations, or the areas necessary for the birds to maintain a stable population. An important area west of Shark River Slough, which until 1993 supported one of two critical subpopulations (nearly half of the entire population), is not included within the designation, and has been undergoing detrimental changes in habitat structure as a result of water management practices. Additionally, other parts of the designated critical habitat have been converted to agriculture, and are no longer occupied by sparrows. Thus, the extent of the critical habitat requires significant review and re-designation.

When re-designating critical habitat for the Cape Sable seaside sparrow, it will be important to include all potential habitat, including areas not recently utilized by the birds. This will help to incorporate the dynamic nature of the bird and the natural variability associated with the Everglades ecosystem. Because the Everglades is a system that evolved with inherent natural variability, native Everglades species developed traits that have allowed them to respond to varying conditions. In the case of Cape Sable seaside sparrows, birds disappear and reappear from known habitat over time, most likely in response to localized breeding conditions. By incorporating all potential habitat, those areas that may be utilized by Cape Sable seaside sparrows over the long-term will be protected.

Most importantly, when re-designating critical habitat, constituent elements must be defined. The primary constituent element for the Cape Sable seaside sparrow should be the maintenance of a hydroperiod that maintains the preferred vegetative communities for successful breeding. During the breeding season, surface water levels should be at or slightly below the surface within the short-hydroperiod prairies, and should be achieved through adherence to a rainfall-driven operational schedule. Adherence to such a regulation schedule will promulgate the restoration of hydropatterns that best support Cape Sable seaside sparrows, in addition to other native Everglades species. Other constituent elements should include necessary vegetative structure, as maintained through appropriate fire management plans, and exotic control program, and a muhly prairie restoration program.

Id. at 3-137 – 3-138. The Service also included a specific task in the draft Recovery Plan that called for the revision of critical habitat:

Review and revise the current critical habitat designation based on distribution surveys. Presently designated critical habitat does not adequately encompass the areas occupied by critical populations of this sparrow and must be re-evaluated. Additionally, some of the designated critical habitat has been lost to agricultural activities. Critical habitat should, at minimum, include habitat west of Shark River Slough which supports one of the two core subpopulations. Additionally, some sites presently identified as critical habitat may, in the future, exhibit longer hydroperiods as a result of the restoration of Everglades hydrology. The appropriateness of the designation of these sites as critical habitat needs to be re-evaluated. Include areas that have been identified as wintering areas for Cape Sable seaside sparrows within the designated habitat.

Id. at 3-154 (emphasis in original).

In the 1999 biological opinion on Mod Waters, the C-111 Project and the Experimental Program, the Service repeated similar statements:

The critical habitat, as designated, does not adequately account for the distribution of the present-day core subpopulations, or the areas necessary for the birds to maintain a stable population... An important area west of Shark River Slough, which until 1993 supported one of the two critical subpopulations (nearly half of the entire population), is not included within the designation, and has been undergoing detrimental changes in habitat structure as a result of water management practices (Curnutt et al. 1998, Nott et al. 1998).

Additionally, other parts of the designated critical habitat have been converted to agriculture and are no longer occupied by sparrows.

Although the critical habitat that was designated for the Cape Sable seaside sparrow did not include constituent elements, hydroperiods that sustain the short-hydroperiod prairies are considered essential for the sparrows to successfully breed and are considered necessary to ensure the species' survival.

1999 BO at 23, 25.

In April 1999, the Service finalized the Multi-Species Recovery Plan, which includes the revised Recovery Plan for the sparrow. MSRP. The final Recovery Plan for the

sparrow contains language that is very similar to the draft MSRP quoted above, and again calls for the revision of critical habitat:

Critical habitat for the Cape Sable seaside sparrow was designated on August 11, 1977 (50 CFR 17.95), before the full distribution of the subspecies was known (Figure 2). The critical habitat, as designated, does not adequately account for the distribution of the present-day core subpopulations, or the areas necessary for continued survival and recovery. An important area west of Shark River Slough, which until 1993 supported one of two critical subpopulations (nearly half of the entire population), is not included within the designation, and has been undergoing detrimental changes in habitat structure as a result of water management practices. Additionally, other parts of the designated critical habitat have been converted to agriculture, and are no longer occupied by sparrows. Thus, Cape Sable critical habitat requires significant review and redesignation. When redesignating critical habitat for the Cape Sable seaside sparrow, it will be important to include all potential habitat necessary for recovery, including areas not recently utilized by the birds. This will help to protect habitat for future expansion of existing subpopulations and provide for the natural variability associated with the Everglades ecosystem. Definition of constituent elements will be another important task when re-designating critical habitat. A key constituent element for the Cape Sable seaside sparrow should be a hydroperiod pattern that maintains the preferred vegetative communities for successful breeding. During the breeding season, surface water levels should be at or below the surface within the short-hydroperiod prairies, and should be achieved through adherence to a rainfall-driven operational schedule. Adherence to such a regulation schedule will promulgate the restoration of hydropatterns that best support Cape Sable seaside sparrows, in addition to other native Everglades species. Other constituent elements should include vegetative structure necessary to support successful breeding.

Id. at 4-352. In addition, the specific recovery item calling for the revision of critical habitat was retained with only minor editorial changes:

Review and revise the current critical habitat designation based on distribution surveys. Presently designated critical habitat does not adequately encompass the areas occupied by core populations and must be re-evaluated. Critical habitat should, at minimum, include habitat west of Shark River Slough that supports one of the two core subpopulations, and should include an analysis of wintering habitat requirements. Additionally, some of the currently designated critical habitat has been lost to agricultural

development and may not be appropriate for inclusion in a revised designation.

Id. at 4-368 (emphasis in original). In addition, the Service noted, in another section of the MSRP, that the Service should:

Define the constituent elements of critical habitat for Cape Sable seaside sparrows. Constituent elements are a pivotal part of any critical habitat designation. When redefining critical habitat for Cape Sable seaside sparrows, constituent elements must be included to allow the critical habitat designation to function as a tool aiding recovery of the sparrow. Any new critical habitat designation must include hydrologic criteria and should capture the structure and composition of the sparrow's breeding and non-breeding habitat.

Id. at 4-372. Thus, after accepting public comment on the draft MSRP, the Service reaffirmed its prior statements about the need to revise critical habitat.

The statements reviewed above establish a precedent that the Service cannot ignore in responding to this petition. The ESA requires the statements in the 1999 Biological Opinion to be based on the "best available scientific and commercial data." 16 U.S.C. § 1536(a)(2). In addition, the ESA requires the Secretary to incorporate in each Recovery Plan, to the maximum extent practicable, "a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species," 16 U.S.C. § 1533(f)(1)(B)(i). As reviewed above, the Service statements in the 1999 BO and the MSRP clearly establish the Service's position regarding the need to revise critical habitat in a manner that is consistent with the relief that is requested in this petition. Given the longstanding, consistent position of the Department of Interior agencies, it would be arbitrary and capricious, in violation of the Administrative Procedure Act, 5 U.S.C. §

706(2)(A), and the ESA, 16 U.S.C. §1533(b), for the Service to refuse to revise the sparrow's critical habitat.

VII. REVISION OF CRITICAL HABITAT

Based on the best available scientific and economic data, the ESA requires the Service to revise the designated critical habitat for the sparrow to: 1) include the historical extent of subpopulation A and remove areas in the other subpopulations that have been converted to agricultural activities; and 2) include the principal biological and physical features that are essential to the sparrow's conservation and the special management considerations that will be implemented to preserve and restore this habitat. 50 C.F.R. § 412.12(b). This second item requires defining the habitat constituent elements, including preferred vegetative communities and structure of the marl prairie, and restoring and maintaining the communities through appropriate management of hydrology, fire, exotics and woody vegetation, and other factors.

A. INCLUSION OF SUBPOPULATION A

The Service must revise the existing boundary of critical habitat to include the historical extent of the habitat occupied by subpopulation A. As the Service has noted in the MSRP, the currently designated critical habitat "does not adequately account for the distribution of the present-day core subpopulations, or the areas necessary for continued survival and recovery. An important area west of Shark Slough, which until 1993 supported one of two critical subpopulations (nearly half of the entire population), is not within the designation, and has been undergoing detrimental changes in habitat structure as a result of water management practices." MSRP at 4-352. For the reasons set forth in this petition and

the supporting documentation, the historical range of subpopulation A clearly contains those physical and biological features that are essential to the conservation of the sparrow and the area requires special management consideration or protection. 50 C.F.R. § 424.14(b).

The Service and Park Service have repeatedly acknowledged the critical importance of Subpopulation A to the sparrow's continued existence. The DOI *Balancing on the Brink* Report notes that "[e]xperts on the seaside sparrow agree that unless two core populations (the Western and Ingraham populations) are maintained, the species' risk of extinction is almost certain. Species with a single core population have an elevated level of risk of extinction due to the potential for catastrophic events."⁹ *Balancing on the Brink* at 11. The number of sparrows in subpopulation A, the Service notes, is "too low to allow the population to function as a core, and the species is now depending on one source, the Ingraham population, for the majority of its reproductive and recolonizing efforts. Catastrophic events such as fire, hurricanes, and floods occur in this area at a frequency of approximately once every ten to twenty years. If the Ingraham population experiences one such event, extinction is almost certain for the Cape Sable seaside sparrow." *Id.* The DOI notes that based on computer risk analyses by Dr. Stuart Pimm, "the western population will decline further and eventually to extinction if the pattern of managed water flows for the last 20 years repeats itself." *Id.* at 12.

The Service must include all of the current and historical known breeding areas of subpopulation A in the revised boundary because designating the geographical area presently occupied by the sparrow as a revised critical habitat "would be inadequate to

ensure the conservation of the species.” 50 C.F.R. § 402.12 (e). As discussed in the Service’s BO on the Experimental Program, in 1981 and 1992, subpopulation A supported nearly half of the total sparrow population, with 2,688 and 2,608 birds, respectively. 1999 BO at 26. By 1998, the population had declined precipitously to 192 birds. Id. at 27; see also Corps, 1992 Cape Sable Seaside Sparrow Breeding Distribution (FINAL) (1998)(Exhibit 32). To include only currently occupied habitat would not be sufficient, because the number of birds and the area of occupied habitat have declined dramatically since 1992.

The Service has repeatedly acknowledged the importance of the entire subpopulation to the sparrow’s continued existence. For example, the MSRP – the document that guides the recovery effort for the sparrow – states:

[w]hen redesignating critical habitat, it will be important to include all potential habitat necessary for recovery, including areas not recently utilized by the birds. This will help to protect habitat for future expansion of existing subpopulations and provide for the natural variability associated with the Everglades ecosystem.”

MSRP at 4-352. The historical distribution of sparrows shows that they disappear and reappear from known habitat over time in response to localized breeding conditions. By incorporating the historical extent of the habitat of subpopulation A, those areas that may be utilized by Cape Sable seaside sparrows over the long-term will be protected. In addition, the BLF would note that the historical extent of subpopulation A’s boundaries roughly approximates the Service’s identification, in the original 1983 Recovery Plan, of the sparrow’s “essential habitat.” The Service has consistently maintained, for 16 years, that this

⁹ The western subpopulation is subpopulation A; the Ingraham population is subpopulation B.

area is essential for the conservation of the sparrow and should be included as critical habitat.

The boundaries of the revised critical habitat designation should be based on the mapping by the Corps of the 1998 Cape Sable Seaside Sparrow Breeding Distribution (FINAL), which is included as Exhibit 14. The boundaries should include not only all areas that were shown as having sparrows identified in 1998 (green areas), but also all areas that were shown as having sparrows identified in at least one year before 1998 (yellow areas). In addition, the Service should consider designating those areas that are identified by Stimson as sparrow habitat. See Stimson 1956 at 491, Figure 1. The Stimson map includes sparrow locations that are not included in the Corps' 1998 map, and represents historical sparrow habitat that may not exist currently because of habitat alterations due to hydrological modifications, fire, or other causes. The BLF requests that the Service convert the areas identified above in the Corps' map and the Stimson map to specific limits using reference points and lines found on standard topographic maps of the area. 50 C.F.R. § 402.12(b).

This Petition has reviewed in detail the threats to population A and its habitat due to the Corps' and District's manipulation in the timing, location, and quantities of water deliveries to ENP. In turn, this modification of the area's hydrology has flooded sparrow breeding habitat and altered the vegetation, resulting in adverse effects to the reproduction and survival of sparrows. See Nott et al. 1998; see also Lockwood et al 1997; 1999 BO; Van Lent et al. 1999; Balancing on the Brink. Ornithological and hydrological data establish that the historical extent of the habitat of subpopulation A contains the physical and biological features that are essential to the conservation of the sparrow. Likewise, this petition

extensively documents that this area requires special management considerations and protection. Id.

In promulgating the final rule revising critical habitat, the Service must provide a detailed review of the management considerations that are necessary to recover and maintain the constituent elements that will ensure sparrow viability and conservation. The proposed rule and the final rule clearly did not adequately address these issues. See 42 Fed. Reg. 40685 (August 11, 1977); 41 Fed. Reg. 28978 (July 14, 1976). The Service has conceded this point. As the Service stated in the Sparrow Recovery Plan component of the MSRP, when re-designating critical habitat, “[d]efinition of constituent elements will be another important task... A key constituent element for the Cape Sable seaside sparrow should be the maintenance of a hydroperiod pattern that maintains the preferred vegetative communities for successful breeding. During the breeding season, surface water levels should be at or below the surface within the short-hydroperiod prairies, and should be achieved through adherence to a rainfall-driven operational schedule.” MSRP at 4-352.

The Service’s 1999 BO adopts specific management criteria that the Corps must meet to ensure maintenance of hydroperiods that allow sparrow reproduction. The Service required that certain standards be met in 1999, 2000, and 2001. By March 1, 2002, the Corps must ensure that at least 60 percent of all regulatory water releases (described as the “supplemental regulatory component” in appendix C of the Final EA for Test 7) crossing the Tamiami Trail enter ENP east of the L-67 extension; the target must be measured and met weekly. 1999 BO at 81. While these criteria are a minimum starting point for specifying

hydrological measures that must be taken to preserve sparrow habitat, the criteria must be modified in the final rule in the following manner.

First, while the 1999 BO contains "exemption" clauses to both of the hydrological criteria listed above, *id.* at 80-82, the BLF does not incorporate these exemptions because we are concerned that they could be interpreted in a manner that provides the Corps and the District with too much leeway to adversely modify and destroy critical habitat. No exemption should be provided in the final rule; rather, the Corps and the District should be required to operate the CS&F project consistent with the requirements of the ESA at all times. As the U.S. Supreme Court has noted, the "pointed omission of the type of qualifying language previously included in endangered species legislation reveals a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies." T.V.A. v. Hill, 437 U.S. 153, 185 (1978); *see also* Amoco Production Co. v. Village of Gambell, Alaska, 480 U.S. 531, 543, n. 9 (1987)(the ESA "contains a flat ban on destruction of critical habitats of endangered species....").

Second, in the 1999 BO, the Corps must meet the 60% target only "until implementation of Modified Water Deliveries Project. 1999 BO at 81. However, because the BLF has concerns about whether Mod Waters will be adequate, *see* Van Lent et al. 1999, we continue to maintain the 60% target requirement, even if Mod Waters is implemented. Finally, we do not include the deadline dates for the actions, as the 1999 BO does; rather, the requested actions must be implemented upon finalization of the rule, or the dates listed in the 1999 BO, whichever is earlier.

As the 1999 BO notes, these targets must be implemented in a manner that is consistent with the purpose of improving water deliveries through the WCAs south of Alligator Alley and ENP, thereby avoiding adverse impacts to tree islands and other threatened and endangered species such as the snail kite and wood stork. The best manner to achieve this is to make regulatory releases to Northeast Shark Slough. In the event that the Corps and the District have an option for meeting the targets under critical habitat, they must choose the option that does not impact listed species or their critical habitat. 1999 BO at 82.

In order to implement hydrological modifications to the operation of the C&SF Project that maintain the necessary vegetative structure of the marl prairie, the final rule also must include additional actions to adequately maintain the prairie's constituent elements. The best available scientific data clearly establishes that excessive fire frequencies can sharply reduce sparrow populations. As discussed above, Curnutt et al. found that while sparrow numbers were highest where there had been one or two fires over the previous 10 year period, sparrows were found at lower numbers at sites with fire frequencies of three to six, and absent from sites that burned seven or more times. Curnutt et al. 1998 at 19.

A multi-step approach should be implemented to reduce excessive fire frequency. A crucial step in addressing excessive fire frequency will be instituting modifications to the regulation schedule to restore hydrology of the eastern areas of the Park. This will reduce the chances of excessive fire by reducing artificially dry conditions in the prairies.

Other steps also should be implemented. ENP and BCNP should develop and implement an appropriate fire management plan that specifically advances conservation of the sparrow. The current ENP fire management plan was adopted five years ago. ENP,

Everglades National Park Fire Management Plan and Environmental Assessment

(1994)(Exhibit 33). However, actions that address the sparrow are discussed in an "interim" management strategy. ENP, CSSS Interim Fire Management Strategy (n.d.)("Interim Fire Strategy")(Exhibit 34). This interim strategy should be reviewed and necessary revisions made. For example, the BLF is concerned that the interim strategy does not sufficiently address utilization of prescribed fire to maintain sparrow habitat. The interim strategy should then be incorporated in a revised fire management plan.

In BCNP, the Preserve adopted a fire management plan in 1994. NPS, Big Cypress National Preserve Fire Management Plan (1994)(Exhibit 35). While this plan does mention the sparrow as benefiting from fire management efforts, the plan does not require that sparrow habitat be burned on a specific frequency in order to maintain sparrow habitat. Based on a records request to the Preserve, the BLF understands that the Preserve has burned a limited area to benefit the sparrow. Letter from Wallace Hibbard, Superintendent, Big Cypress National Preserve, to Sidney Maddock, Environmental Analyst, BLF (August, 1999). However, the BLF is concerned that BCNP's current approach may not result in a sufficient area of sparrow habitat being burned.

A fire management strategy should incorporate several steps. In areas where repeated arson events have occurred, agencies must review access routes to the area. If no other reliable method is available to eliminate the arson risk, then the agencies must eliminate access to these areas by closing and removing any roads and restoring the vegetation. Without easy access, it will be much harder for arsonists to access the areas and repeatedly start fires. Additional law enforcement personnel should be hired and added to

police areas where arson is a concern, and increased fire prevention signs should be placed in areas of concern, including East Everglades, Tamiami, Southern Glades, and Main Park Road areas. In addition, *Casuarina* eradication efforts should be funded in subpopulation F area; *Casuarina* invasion has served to increase fire frequency by facilitating fires to burn overnight, which historically occurred less often.

Available information also suggests that if sparrow habitat is not burned on a sufficient basis, the habitat structure may be modified and reduced sparrow densities may result. As discussed above, the Petitioners are concerned that the habitat of subpopulation B has not experienced a significant fire recently. Other areas – such as subpopulation D – went at least eight years without a prescribed fire. Interim Fire Strategy at 1.

There is some question, however, as to what frequency is sufficient. Werner suggested that sparrow use declines after 4 years, Werner 1975 at 196, and accordingly suggested that approximately 15 to 20% of habitat be burned each year. Id. at 205. However, more recent work by Curnutt et al suggests that sparrow densities were highest when areas were burned once or twice over a ten-year period. Curnutt et al. 1998. Based on this information, it appears that the agencies should implement a schedule of prescribed burning of sparrow habitat at a minimum of once every ten years to maintain vegetation composition that is conducive to the continued long term use.

The burns should be planned and conducted in a manner that does not result in all the available habitat of a subpopulation being burned on one occasion, so that unburned areas remain where the sparrows can seek refuge during the fire and breed in succeeding years. In addition, burning should be done in August and September to approximate the

timing of lightning strikes that follow the breeding season. Werner 1975 at 205. Werner also recommended single spot ignition to prevent junction zones that may trap individuals, id., but it is not clear if this recommendation can be easily implemented in a manner that would be consistent with the other burning goals and fire management techniques.

As the best available scientific and commercial data documents that sparrows are being adversely affected by the spread of exotic plants and woody vegetation, state and federal agencies also must implement a control program that results in the eradication of exotic plants in sparrow habitat. Currently, ENP and BCNP both have exotic control efforts. See Robert F. Doren & David T. Jones, Plant Management in Everglades National Park, in Strangers in Paradise. Impact and Management of Nonindigenous Plants (Daniel Simberloff et al. eds. 1997)(“Doren and Jones”)(Exhibit 36); Pernas and Snyder. The current strategy in ENP is to focus on individual plants and outliers rather than dense stands. Doren and Jones at 282. Control work of melaleuca in the Expansion Area is contracted by the Park, with low to medium density stands being manually treated and high density stands being treated with aerial application of herbicides. Jones at § 1.4.4. The remaining, untreated 7,250 ha contain the largest and densest populations; assuming that management approaches and funding remain constant, the initial treatment in this area can be completed in ten years. Id. at § 1.4.6.

An exotic control program should include any exotic plant species that threaten sparrow habitat, including but not limited to, *Casuarina litorea*, *C. glauca*, *Melaleuca quinquenervia*, and *Schinus terebinthifolius*. In addition, areas that have been treated must be surveyed each proceeding year for at least six years, and, if necessary, re-treated to

remove any remaining exotics. Based on our review of the existing exotics control efforts, the BLF is concerned that control efforts are not focusing on sparrow habitat, or even considering sparrow habitat as a factor in determining treatment areas. Existing treatment methodologies should be modified to give a higher priority to treating areas of sparrow habitat that are threatened by exotics.

B. EXCLUSION OF PRIVATELY OWNED AGRICULTURAL AREAS

The existing boundary of critical habitat should be revised to exclude areas of privately owned residential or agricultural lands that are within designated critical habitat and not scheduled for acquisition. These areas adjoin certain parts of subpopulations C, D, and F. Once converted to intensive agriculture or development, these areas can no longer support sparrow use.

The BLF does not include historic or current agricultural or residential areas that are within public ownership in the area that should be removed from critical habitat. The BLF also does not include the areas that are currently in private hands, but are within the boundaries of areas that are scheduled to be purchased, in the area that should be removed from critical habitat.

Agricultural and residential development have destroyed extensive amounts of marl prairies. The BLF understands that under existing knowledge, difficulties exist in restoring areas that have been extensively rock-plowed. However, knowledge about restoring habitat types is advancing rapidly; habitat types that were once thought to be unrestorable – such as wiregrass in the longleaf pine ecosystem, for example – now can be restored. With the degraded marl prairie lands that remain in public hands or that will be purchased in the

future, the Petitioners are hopeful that restoration efforts can eventually be developed which will allow these areas to be restored so that these areas can again benefit sparrows. In addition, Petitioners also are including these lands because we are concerned that they will be necessary for the sparrow to achieve recovery.

C. AREAS AFFECTED BY RESTORATION ACTIVITIES

The BLF is not petitioning to revise the boundaries of critical habitat for subpopulations C, D, or F based upon the justification that "restoration" projects may change these areas' constituent elements. The Service's draft MSRP notes that "some sites presently identified as critical habitat may, in the future, exhibit longer hydroperiods as a result of the restoration of Everglades hydrology. The appropriateness of the designation of these sites as critical habitat needs to be re-evaluated." Draft MSRP at 3-154. However, the final MSRP dropped this language; the Service no longer calls for the revision of the boundary based on this factor.

This position is consistent with the analysis in the 1999 BO, because this document indicates that even after the implementation of restoration activities, these areas still will provide important habitat for the sparrow. Accordingly, the best available scientific evidence does not exist to indicate that the boundaries of critical habitat should be modified to address the effects of "restoration" activities.

D. CONSTITUENT ELEMENTS OF THE REMAINING CRITICAL HABITAT

As discussed above, the existing designation of critical habitat does not include a sufficient discussion of the principal biological or physical elements within the defined area that are essential to the conservation of the sparrow. While this petition discusses above the

constituent elements of the marl prairie communities, this discussion also is applicable to the currently designated areas of critical habitat. Accordingly, the DOI and the Service should revise the designation for the remaining area of critical habitat to include the principal biological and physical features that are essential to the sparrow's conservation and the special management considerations that will be implemented to restore and preserve this habitat. 50 C.F.R. § 412.12(b).

E. ECONOMIC ANALYSIS

The Secretary, in designating critical habitat, is required to consider the economic effects of critical habitat designation. 50 C.F.R. § 424.19. The BLF does not believe that there are any significant activities that would affect the area considered for designation, *id.*, as the land that is to be covered by the revised critical habitat boundary is publicly owned and part of ENP and BCNP.

In addition, the BLF does not believe that there are any significant areas or activities that likely would be affected by the designation. *Id.* While there may be very limited impacts – for instance, to the residents of the 8.5 SMA – due to the modifications in timing, distribution, and amount of flows that will be necessitated by modifications to the C&SF Project regulations, it must be remembered that currently, these residents already are being provided with a level of flood protection that has resulted in jeopardy to the sparrow, in violation of section 7(a)(2) of the ESA, 16 U.S.C. § 1536(a)(2). Thus, the operation of the C&SF Project will be required to be modified, independent of the effects of this petition. In addition, as the Corps and the District are artificially maintaining excessively low water levels in this area, the modification of water management regulations would result in the

partial restoration of the hydrology of the area, and is thus not a taking of private property for a public purpose. Finally, the 1999 BO explicitly requires the acquisition of "flowage easements" to cover the effects of modified water management regulations. The BLF understands that the Corps has agreed to either purchase the land or acquire flowage easements. Thus, there can be no credible argument that a significant adverse economic effects will occur from the designation, or that the benefits of excluding subpopulation A are outweigh the benefits of specifying the area as part of critical habitat. 16 U.S.C. § 1533(b)(2).

In addition, even if the Secretary believes that the benefits of excluding this area of critical habitat outweigh the benefits of specifying the area as part of critical habitat," *id.*, the Secretary "shall not exclude any such area if, based on the best scientific and commercial data available, he determines that the failure to designate that area will result in the extinction of the species concerned." *Id.* The record clearly establishes that revision of critical habitat is necessary to prevent the extinction of the sparrow. The Corps and the District have been operating the CS&F Project under a jeopardy finding by the Service since 1995. Despite the passage of four years, strong admonitions by the Service, and studies by scientists concluding the extinction of the sparrow is likely within two decades, if not sooner, the Corps and the District have yet to take the necessary steps to remove the sparrow's jeopardy status. The additional statutory protection afforded by critical habitat clearly is necessary to force the District and the Corps to modify their harmful activities so that the Cape Sable seaside sparrow does not become extinct.

F. CRITICAL HABITAT REVISION IS PRUDENT AND DETERMINABLE

The revised critical habitat discussed above is prudent and determinable. 50 C.F.R. § 402.14(a).

While the sparrow is threatened by taking or other human activity, there is absolutely no evidence that identification of critical habitat "can be expected to increase the degree of such threat to the species." 50 C.F.R. § 402.12(a)(1)(i). The threat to the sparrow is water management activities that have adversely modified and destroyed habitat; the threat is not from taking sparrows or their nests and eggs through poaching. In addition, there is no evidence that the currently designated critical habitat has resulted in increased threat. Finally, subpopulation A is found wholly within the boundaries of ENP and Big Cypress National Preserve; private property is not included within this habitat. The vast majority of historical distribution of subpopulation A is located a good distance from any paved road; in addition, to get to the habitat, one would have to travel through difficult terrain. Thus, there can be no reasonable argument that critical habitat will increase the threat to the sparrow. Rather, in heightening the awareness of the importance of subpopulation A to the continued existence of the sparrow, and requiring the implementation of specific management requirements for sparrow habitat, critical habitat clearly will reduce the threat to the sparrow.

The revision to critical habitat is determinable. 50 C.F.R. § 402.12(a)(2). As discussed above in detail, extensive recent studies have been completed on the life history of the sparrow. The biological needs certainly are sufficiently well known to permit identification of the historical extent of the habitat of subpopulation A as critical habitat and

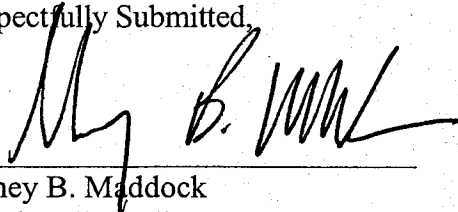
to revise the constituent elements. In addition, sufficient information exists to perform the required analyses of the impacts of the designation.

VIII. CONCLUSION

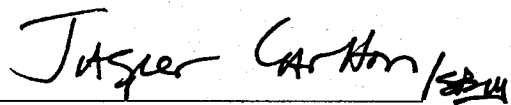
Two independent, expert peer review panels, extensive studies by different scientists, and repeated statements by agency officials repeatedly reach the same conclusions regarding the decline of the sparrow, the destruction and degradation of its habitat, and the management modifications that must be implemented to prevent the extinction of the sparrow. The best available scientific and commercial data compel the conclusion that the Service must revise the sparrow's designated critical habitat to address these issues.

Extensive biological information demonstrates the importance of subpopulation A to the continued existence and recovery of the sparrow. In addition, the agencies of the Department of Interior have explicitly recognized the need to revise critical habitat to include subpopulation A and to include a more explicit discussion of the constituent elements. Finally, there are continuing threats to the habitat in subpopulation A, as well as the eastern subpopulations, due to modifications in the historical timing, distribution, and quantities of water flows. As discussed above in detail, the Endangered Species Act requires the Secretary and Director to respond to this Petition by revising the boundaries of designated critical habitat for the Cape Sable seaside sparrow to include the historical extent of the habitat of subpopulation A and by revising the designation to include a detailed discussion of the constituent elements and special management considerations necessary to conserve the sparrow.

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EXHIBITS

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TAB

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