

FINAL DETERMINATION OF THE U.S. ENVIRONMENTAL  
PROTECTION AGENCY'S ASSISTANT ADMINISTRATOR  
FOR WATER, CONCERNING THREE WETLAND PROPERTIES  
(sites owned by Henry Rem Estate, Marion Becker, et. al. and Senior Corporation)  
FOR WHICH ROCKPLOWING IS PROPOSED IN EAST EVERGLADES,  
DADE COUNTY, FLORIDA

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## I. INTRODUCTION

Section 404(c) of the Clean Water Act (CWA, U.S.C. 1251 et seq.), authorizes the Administrator of the Environmental Protection Agency (EPA) to prohibit or restrict the use of any defined area as a disposal or discharge site whenever he or she determines, after notice and opportunity for public hearing, that the discharge of dredged or fill material into such area will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. Before making such a determination, the Administrator must consult with the Chief of the Army Corps of Engineers, the property owner(s), and the applicant(s) in cases where there has been application for a Section 404 permit.

EPA's regulations implementing Section 404(c), 40 CFR Part 231, establish procedures to be followed in exercising the Administrator's authority to prohibit or restrict the use of an area as a disposal site. The three major steps in the process are: 1) the Regional Administrator's proposed decision to prohibit or restrict the use of a site, 2) the Regional Administrator's recommendation to the Administrator to prohibit or restrict use of the site, and 3) the Administrator's final decision to affirm, modify, or rescind the regional recommendation. The Administrator has delegated the authority to make a final decision under Section 404(c) to the Assistant Administrator for Water, who is EPA's national Section 404 program manager.

This Final Determination concerns the proposed rockplowing of three separately-owned wetland properties totaling 432 acres in East Everglades, Dade County, Florida. Figure 1 shows the location of the wetlands at issue within East Everglades and their relationship to each other. Figure 2 shows these sites within a regional context. The Regional Administrator has recommended that I determine that rockplowing these wetland properties would cause unacceptable adverse effects on fishery, wildlife and recreational areas and that I prohibit the use of these wetland properties as disposal sites for rockplowing.

This Final Determination is based on careful consideration of the record developed by EPA and the Corps of Engineers (Corps) in this case, including the public comments submitted in response to the notice announcing the proposed determination and at the public hearing, the comments of other federal and state agencies and the information received during EPA Headquarters' consultation. As described more fully below, I have determined that rockplowing the wetland sites at issue will result in the loss of habitat that is very important to the wildlife of the Everglades National Park - East Everglades wetlands ecosystem. This conclusion, combined with the cumulative losses of East Everglades wetlands leads me to my determination that the discharge of fill material, as a result of rockplowing the Rem, Becker and Senior Corp. sites, will result in unacceptable adverse effects to wildlife. Therefore, I am affirming the Regional Recommended Determination (hereinafter RD), with modifications, and exercising my authority to restrict the designation of the subject wetlands as discharge sites. EPA's 404(c) action is based

on the impacts of rockplowing, and prohibits the activity of rockplowing these wetland areas. This Determination does not pertain to other types of filling activities. Other proposals involving the discharge of fill material on the wetland sites at issue will be evaluated on their merits within the Corps regulatory permit program. I explain the basis for my conclusions in the following sections.

REM SITE  
BECKER SITE

SENIOR CORP.  
SITE

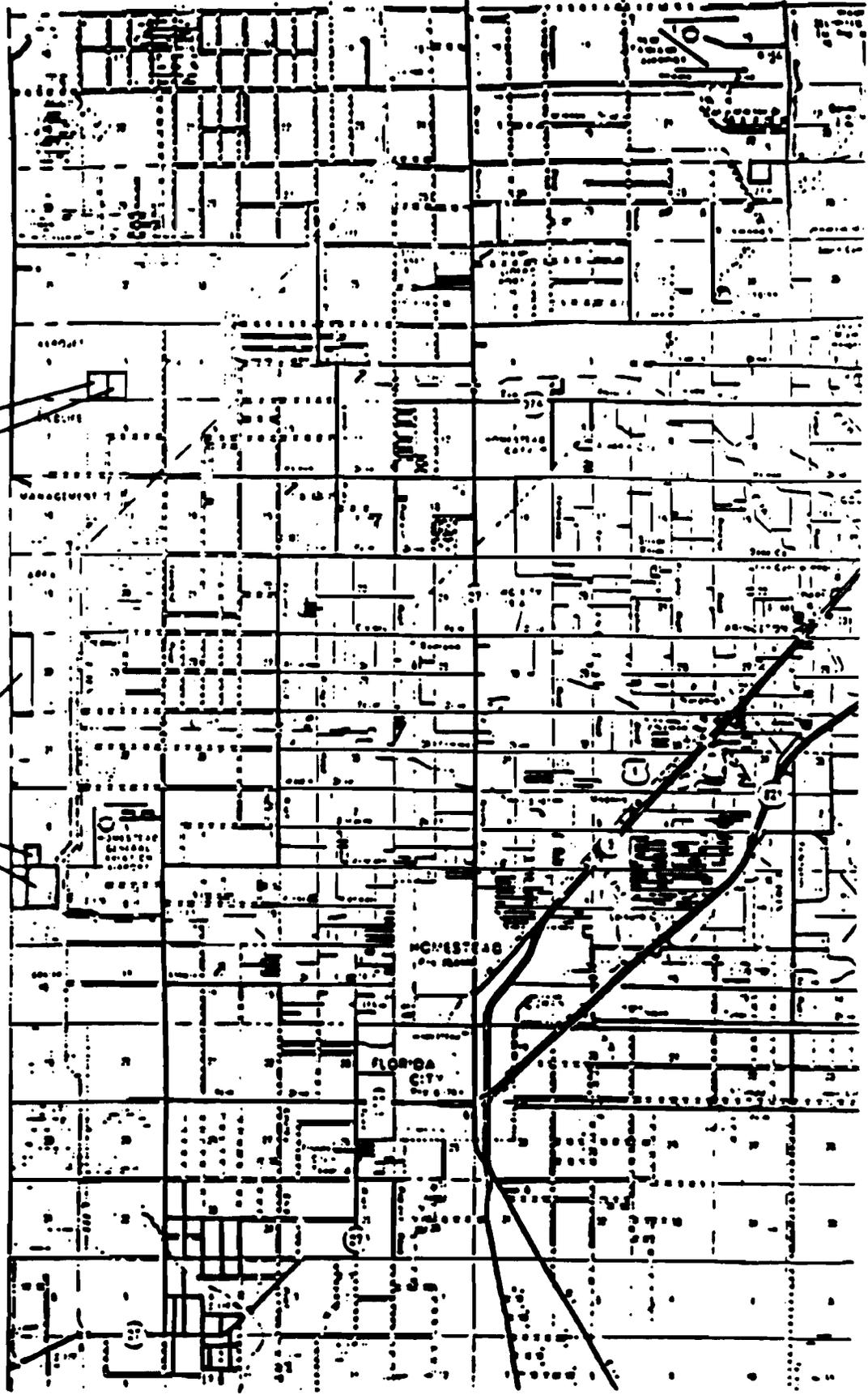
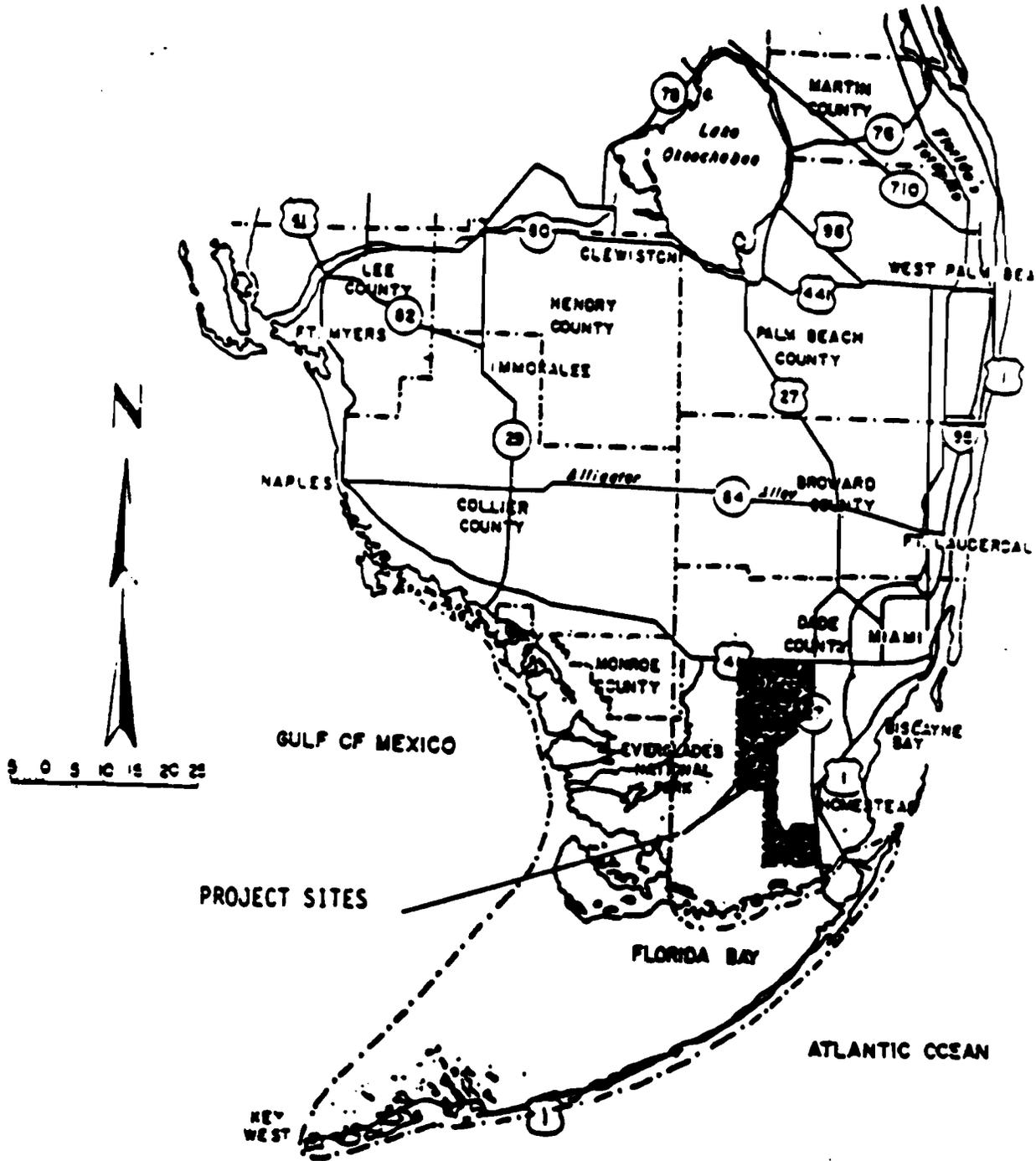


FIGURE 1



## REGIONAL CONTEXT

FIGURE 2

## II. PROJECT DESCRIPTION AND BACKGROUND

Review of the RD and the administrative record pertaining to this case revealed that Region IV's Determination accurately reflects background events leading to my consideration of the RD. I hereby adopt Sections II, V and VI of the RD (pages 1-12 and 16-30). Below, I summarize information from the RD pertaining to my findings, provide additional background and summarize EPA Headquarters actions.

### A. The Project

Rockplowing is a process used to prepare land for farming where there is surface rock. In this process, a bulldozer is used to drag a multitoothed plow-like implement to break up and crush surface rock by making multiple passes across the site in perpendicular runs. With respect to the projects at issue, rockplowing would be used to break up and crush the limestone substrate of the wetlands and redistribute the crushed limestone so as to fill in the solution holes which are characteristic of the wetlands and provide a smooth and level surface for farming. This process also has the effect of eliminating wetlands vegetation on the site. Rockplowing in wetlands is considered a discharge of fill material subject to regulation pursuant to Section 404 of the CWA. The wetlands for which rockplowing is proposed are considered proposed disposal sites which must be specified (i.e., permitted) pursuant to Section 404 of the CWA for rockplowing to occur.

As previously stated, this Section 404(c) action addresses proposed and anticipated rockplowing activities in three separately owned wetland properties totaling 432 acres in East Everglades, Dade County, Florida. The first property is a 60 acre tract owned by Henry Rem Estate (the Rem site) which is located in the western quarter of Section 5, Township 56 South, Range 38 East, about one mile south of SW 168th Street (Richmond Drive) and about 1.8 miles west of the L-31N canal and levee. The second property is another 60 acre tract owned by Mrs. Marion Becker, Mrs. Bilba Burke, Mr. Paul Yanowitz, Mr. Euval S. Barrekette and Mr. Irving Sonneshein (the Becker site) which is located adjacent to and east of the Rem site, in Section 5, Township 56 South, Range 38 East. The third property is actually three separate wetland tracts totaling 312 acres owned by Senior Corporation (the Senior Corp. site) which lies about 2.5 miles south of the Rem and Becker sites and extends along SW 232nd Avenue and south to SW 304th Street. The first tract is comprised of approximately 132 acres of wetlands within Section 7, Township 57 South, Range 38 East, the second tract is comprised of approximately 150 acres of wetlands within Section 30, Township 56 South, Range 38 East, and the third tract, comprised of approximately 30 acres of wetlands, is located within Section 6, Township 57 South, Range 38 East.

At the time EPA's Section 404(c) action commenced, property owners of the Senior Corp. site (three wetland tracts; 312 acres) and the Rem site (60 acres) were actively pursuing permits from the Army Corps of Engineers (Corps) to rockplow. The Corps had announced its intention to issue a Section 404 CWA permit authorizing rockplowing on the Rem site and was in

the process of preparing documentation for a permit decision concerning rockplowing on the Senior Corp. site when EPA Region IV initiated the 404(c) action. Property owners of the Becker site (60 acres) have not yet applied for a permit to rockplow. However, EPA Region IV felt that the Corps had predisposed itself to issuing a permit authorizing rockplowing on the Becker tract in the supporting documentation for the permit to Henry Rem Estate (the Corps implied that it may issue a permit for rockplowing this site, if applied for, because its juxtaposition to adjacent agricultural areas was similar to that of the Rem site). Section 231.1 of the Section 404(c) regulations states that EPA's Section 404(c) authority may be used either to veto a permit which the Corps has determined it would issue (as in the case of the Rem site) or to preclude permitting either before the Corps has made its final decision (as in the case of the Senior Corp. site) or in the absence of a permit application (as is the case of the Becker site). EPA Region IV concluded that because the Rem, Becker and Senior Corp. sites are ecologically similar portions of the East Everglades wetlands complex, and that rockplowing would be or had a high probability to be authorized and would result in similar unacceptable adverse environmental effects, this 404(c) action should include all three properties. I concur that this is appropriate.

#### B. EPA Headquarters Actions

After the close of the public hearing comment period, the Regional Administrator submitted to me the RD, to prohibit the specification of the Rem site, the Becker site and the Senior Corp. site as disposal sites for rockplowing, along with the administrative record compiled by the Region. The RD is based upon a finding that rockplowing the wetland areas at issue will result in unacceptable adverse effects on fishery areas (including spawning and breeding areas for forage fish), wildlife and recreational areas. The RD is dated February 9, 1988 and, along with the administrative record, was received at EPA Headquarters on February 16, 1988.

EPA subsequently notified the involved property owners (via their representatives) and Mr. John Elmore, Chief, Operations and Readiness Division, Corps of Engineers, by letters dated March 3, 1988, of their opportunity for consultation in compliance with the Section 404(c) regulations.

The Corps responded to their invitation for consultation in a letter from Mr. Elmore dated March 28, 1988. The letter stated that the Corps did not intend to pursue any corrective action on the cases in which the Corps had been involved (Rem and Senior Corp.). The letter also stated the Corps belief that the Jacksonville District had made a reasonable and balanced decision on the Rem permit application and that there was no reason to believe that the District would have come to an unreasonable decision on the Senior Corp. permit application. Notwithstanding the support for the Jacksonville District, however, the letter further stated that the Corps believed this Section 404(c) action to be appropriately focused on unacceptable adverse effects on the Section 404(c) statutory criteria and that Sections 230.10(c) (significant degradation) and 230.11(g) (cumulative impacts) are relevant sections of the Guidelines for determining the unacceptability of impacts.

The property owners also responded to EPA's March 3, 1988 letters. Mr. Marvin Cassel, representing Mr. Irving Sonneshein, Mrs. Bilba Burke, Mr. Paul Yanowitz and Mr. Euval S. Barrekette, owners of part of the Becker site, responded in a letter dated March 21, 1988. He registered the property owners' general objection to EPA Region IV's findings and recommendation. He stated that there is a general need for farmland and that rockplowing and subsequently farming the Becker site would not endanger or contaminate the area and would permit vacant land not part of Everglades National Park to be used to the benefit of the community. He also stated that EPA's 404(c) action is nothing more than a "condemnation by administrative order without payment". He also questioned a statement in the RD to the effect that in correspondence to EPA Region IV, the Florida Department of Environmental Regulation (FDER) had stated that the Becker site was under consideration for possible purchase by the state, saying that he knew of no such possible purchase.

During a telephone conversation subsequent to the letter, Mr. Cassell questioned whether he could attend the meeting with the Senior Corp. representatives. He was advised that he could request his own meeting or contact Mr. O'Donnell with respect to the meeting scheduled for Senior Corp.. Mr. Cassell did not request a consultation meeting and did not attend the meeting with the Senior Corp. representatives.

Mr. Anthony O'Donnell, representing Senior Corp., responded in a letter dated March 22, 1988 and requested a meeting which was subsequently scheduled for May 4, 1988. On May 4, members of my staff and I met with Mr. Anthony O'Donnell, Senior Corp.'s legal representative and Mr. Harold Cobb, a consulting engineer and landscape architect who represented Senior Corp. during the Corps' permit process. The specific points they raised are discussed in Section II C of this Determination.

Henry Rem Estate did not respond to its opportunity for consultation. Receipt of EPA's letter dated March 3 was verified by telephone call with Mr. Tom Reider who represents the Estate. Although Mr. Reider mentioned at that time that he would discuss EPA's offer for consultation with Mrs. Rem, no subsequent correspondence or meeting request was received. In addition, Mr. Neal Toback, representing Mrs. Marion Becker, did not respond to EPA's offer of consultation; receipt of EPA's March 3 letter was verified by telephone.

EPA's original deadline for completing this 404(c) action was April 18, 1988 (60 days after EPA Headquarters' receipt of the RD and administrative record in accordance with the 404(c) regulations). However, Senior Corp.'s March 22 letter requested a meeting after April 15, which was near this deadline, and we desired to provide an opportunity for consultation for other involved property owners, whom we expected to request additional meetings. Therefore, in accordance with Section 231.8 of the 404(c) regulations, I extended the time requirements for the time period provided in Section 231.6 for EPA Headquarters' actions on the RD to June 15, 1988. Notice of this extension appeared in the Federal Register (53 F.R. 12729) on April 18, 1988.

### C. Response to Issues Raised During Consultation

At their meeting with me, Mr. O'Donnell and Mr. Cobb provided an overview of the Senior Corp. site and its relationship to adjacent East Everglades wetlands, existing adjacent agricultural areas as well as existing adjacent flood control structures. Mr. O'Donnell and Mr. Cobb made the following technical points concerning the wetland characteristics of the Senior Corp. site. They stated that the relatively high site elevation and reduced hydroperiod (due to the proximity of the adjacent L-31N canal) has resulted in a stressed wetland condition; and that a study (Technical Publication 85-3 dated September, 1985) completed by the South Florida Water Management District (SFWMD) concluded that the area within one mile of the L-31N canal (which includes the Senior Corp. site) was not in danger of flooding as a result of releasing more water through Northeast Shark River Slough. They stated that this is because of effective drainage provided by the canal. They also stated that while there are algae, fish and water in the solution holes, the wetland surface does not exhibit standing water or the periphyton algae mat characteristic of an unstressed East Everglades prairie wetland; that there was only limited wildlife utilization of the site; that the U.S. Department of Interior has concluded that rockplowing the Senior Corp. site would not jeopardize the Cape Sable Sparrow, a federally listed endangered species; and that while a Florida Panther, also a federally listed endangered species, had been tracked across the Senior Corp. site, there is no proof that rockplowing would adversely affect this species. I will respond to the technical issues raised at pertinent places in the remainder of this document.

During the meeting the Senior Corp. representatives also raised three "programmatic" arguments. First, they asserted that Senior Corp.'s sale of some of its wetlands further west in East Everglades to the State of Florida as well as Senior Corp.'s deletion from its permit application of approximately 426 acres of wetlands (which are adjacent and west of those wetlands at issue in this 404(c) action) establishes a buffer between existing and proposed agricultural operations and state-owned wetlands to the west, effectively stays the westward migration of agriculture and prevents cumulative impacts anticipated from future rockplowing proposals. Second, Mr. O'Donnell stated that it would be more appropriate for EPA to exercise its Section 404(c) authority over the approximately 426 acres closer to Everglades National Park (ENP) that Senior Corp. had eliminated from its permit application to the Corps than over the Senior Corp. sites at issue. Finally, Mr. O'Donnell opined that it would be more appropriate if EPA pursued a "quasi-legislative approach" with its 404(c) action. He suggested that a broad based approach, possibly using boundary criteria such as wetland surface elevation and proximity to the L-31N canal and covering all areas meeting those criteria, would be more effective in addressing wetlands losses in East Everglades.

Except for increased specificity with respect to the quasi-legislative Section 404(c) approach, Senior Corp. had already raised these programmatic issues during EPA Region IV's Section 404(c) process. Senior Corp.'s central theme is that if EPA is concerned with the loss of valuable East Everglades

wetlands, the agency should take a broader approach, delineate all valuable wetlands in East Everglades, and pursue a Section 404(c) action to prevent their loss. The RD provides a substantive response to these and other issues raised by Senior Corp. (RD, pp. 24-30). I would add that while I believe that the idea of advanced planning in East Everglades from a Section 404 perspective has merit (although not necessarily in conjunction with a Section 404(c) action), it does not foreclose case by case consideration of the adverse environmental impacts that would result from rockplowing particular wetland areas.

At the meeting Mr. O'Donnell also resubmitted Exhibits A-M from the Senior Corp.'s submission at EPA Region IV's 404(c) public hearing on November 18, 1987 and repeated some of the points discussed at pp. 7, 18-19 of the RD. These exhibits include the Dade County/East Everglades Management Plan (EEMP) and the Everglades National Park/East Everglades Resource Planning and Management Implementation Plan (ENP/EERPMIP). Mr. O'Donnell pointed out that the Senior Corp. site was within an area delineated as management area 3B in the EEMP within which Dade County permits agriculture. Mr. O'Donnell also pointed out that according to the ENP/EERPMIP, rockplowing would be acceptable within one mile west of levee L-31N from 168th Street south to Frog Pond (which includes the Senior Corp. site). I concur with Region IV's response to these points at pp. 25-26 in the RD. I would also add that, even if the Management Plans referenced in Exhibits A-M would accept rockplowing in an area containing the Senior Corp. property, that does not control the acceptability of rockplowing under Section 404(c) as different factors are considered in the two contexts.

Mr. Marvin Cassell, in his letter on behalf of some of the owners of the Becker site, stated that there is a general need for farm land, and that rockplowing and subsequently farming the Becker site, vacant land not part of the ENP system, would permit it to be used with some benefit to the community as a whole for farming. Under Section 404(c), my determination must reflect consideration of the Section 404(c) statutory criteria; accordingly, in the case at hand, EPA must assess the values of the Becker site and determine whether the loss of these values will cause unacceptable adverse effects to the statutorily-listed resources.

### III. DESCRIPTION OF THE SITES UNDER CONSIDERATION

Review of the RD and administrative record revealed that the RD provides an accurate description of the wetland sites at issue and their values. I hereby adopt Section III (pages 12-14) of the RD as part of my Final Determination (FD). Below, I summarize pertinent parts of the RD and provide additional discussion on hydrology and wildlife. I also focus my discussion of wildlife on those species which are generally characteristic of the prairie wetlands of East Everglades and specifically those species which have been observed either on the wetlands sites at issue in this Section 404(c) action or on similar adjacent wetland tracts.

#### A. Hydrology

South Florida receives most of its annual rainfall during the wet season, which is generally from May to October. It is during this time that the wetlands of south Florida are inundated by surface and groundwater, which are closely connected hydrological systems, via extremely porous limestone strata that underlie south Florida at or near the land surface. Generally, surface water in the East Everglades flows south and southwest and groundwater flows southeast. Water management or distribution in south Florida is facilitated via a highly sophisticated system of flood gates, pumping stations, canals, levees and impoundment areas operated and maintained by the SFWMD. Historically, the purpose of this system was to provide regional drainage and flood control. However, the purpose of the system has been expanded to include development of water supplies, conservation of natural resources and the protection of water quality. There are currently ongoing studies and experiments that are directed at improving the system's ability to meet the expanded and sometimes conflicting functions that it must perform.

The canals of SFWMD's system have an effect on adjacent groundwater elevations within the East Everglades due to the extreme porosity of the limestone strata. The canals serve to draw adjacent groundwater when the canal's water elevation is below that of the adjacent water table and generally lower adjacent groundwater elevations. Conversely, the canals can recharge adjacent groundwater levels when the water levels in the canals are higher than adjacent groundwater elevations. The degree of groundwater elevation change and the rate at which it occurs (and, ultimately, the effect on the hydroperiod of the adjacent wetland) depends upon the wetland's distance from the canals and generally decreases as distance from the canal increases. Of particular interest in this case is the L-31N canal, constructed in the 1970's, which runs north to south along the eastern boundary of East Everglades and is in close proximity to the wetland sites at issue with respect to this 404(c) action. This canal is utilized to provide flood control for adjacent agricultural operations that are conducted during the dry season.

The administrative record indicates that the Rem and Becker sites are approximately 1.8 miles west of the L-31N canal and the Senior Corp. sites are less than one mile west of the canal. In addition, there is a small borrow ditch adjacent to Richmond Drive which passes to the north of the Rem and Becker site. The southernmost 132 acre parcel of the Senior Corp. site is also adjacent to the L-31W canal which is the northern boundary of the Frog Pond agricultural area. The record indicates that the Rem, Becker

and Senior Corp. sites are seasonally inundated by groundwater which rises as a result of rain in the region. The sites at issue experience flooding conditions which vary depending chiefly on the frequency, duration and intensity of the rainfall experienced in the region. Historically the sites served as part of Taylor Slough which provided a flow-way for surface water to ENP. Currently, however, predominant flow is southeast through the limestone strata, with surface water flows toward ENP only during extreme storm events.

During consultation, Senior Corp.'s representatives noted that Technical Publication 85-3, prepared by SFWMD, concluded that the area within one mile of the L-31N canal (which includes the Senior Corp. site) was not in danger of flooding; the representatives said this was because of the effective drainage provided by the canal. Technical Publication 85-3 provides an analysis of the second 90-day field test of experimental water deliveries to Northeast Shark River Slough (NESRS) under wet season conditions. Review of the Publication revealed that it reaches the conclusion noted by Senior Corp.'s representatives because monitoring during the test revealed that groundwater elevations were not affected by releasing water through NESRS, and not because of drainage provided by the canal. Indeed, it noted that, there were two instances where rainfall events brought the water table close to the surface in developed areas within East Everglades during the test. Therefore, I do not believe that Technical Publication 85-3 supports the Senior Corp. representatives' claims. It appears that the L-31N canal does not provide drainage so as to maintain adjacent groundwater elevations in wetlands adjacent to the canal (including the Senior Corp. site) at a constant level in all circumstances and that wet season hydrological conditions can result in high groundwater elevations and increases in hydroperiods.

Past water management activities have had a significant effect on the integrity of the south Florida wetlands ecosystem. Therefore, I believe a brief discussion of the future of water management practices is relevant. The Everglades Status Report (ESR), dated January 12, 1988 which was obtained during the Everglades Coalition Meeting and subsequently incorporated into the administrative record, discusses two studies being prepared by the Corps and a resolution issued by the SFWMD which bear upon the discussion on hydrology in this case. The first study is the ENP Water Supply General Design Memorandum (GDM), which is a study of potential modifications to the water management system to improve water delivery to ENP as well as an analysis of flood control options for residential and agricultural interests in East Everglades. The second study is a draft report concerning the restoration of Canal 111 (C-111) Basin in the southern portion of East Everglades and ENP (and south of the wetland sites at issue) which addresses structural modifications and additional structures to increase flows to the park and Florida Bay and hold groundwater levels higher while continuing to provide flood protection to developed and agricultural areas in East Everglades. The SFWMD resolution establishes a phase out schedule for groundwater drawdowns in conjunction with current agricultural activities in the Frog Pond area which is immediately south of the southernmost portion of the Senior Corp. site.

My review of the ESR in conjunction with subsequent telephone conversations between personnel of the Corps' Jacksonville District and my staff indicate that the current trend in water management in the Everglades is to generally enhance hydrological conditions to benefit wetlands and to, at a minimum, preserve those hydroperiods, which are currently managed at their current levels. Review of the administrative record did not reveal any future plans or proposals that would have the effect of further decreasing the hydroperiod of East Everglades in general or the wetland sites at issue in particular. It appears, therefore, that the current hydroperiod of the area, and the wetland productivity that it sustains, will at a minimum be maintained.

In considering whether the proposed discharges will cause unacceptable adverse effects, I do not base my conclusions on potential changes on water management. EPA must evaluate current environmental circumstances. EPA acknowledges that the hydrology of the wetlands sites at issue are influenced by the L-31N canal and that the hydrology of the southernmost portions of the Senior Corp. site are influenced by the L-31N and the L-31W canals. EPA also acknowledges that as long as the water levels within the canals are managed in the future to facilitate agricultural operations, that the subject wetland sites will continue to experience a shortened hydroperiod. The question before EPA, however, is -- notwithstanding the influence of the canals -- do the wetland sites at issue provide wildlife benefits such that their loss would represent an unacceptable adverse effect? As explained in the remainder of this document, my conclusion is that they do.

#### B. Site Descriptions and Values

The Rem site is bordered by rockplowed agricultural fields to the west and south, by wetlands to the north and by the adjacent Becker site to the east. The Becker site is bordered on its eastern and southern sides by rockplowed agricultural fields, on its northern side by wetlands and by the Rem site to the west. Together, the Rem and Becker sites comprise a 120 acre "pocket" of wetlands that is adjacent to agricultural areas to the west, south and east and adjacent to a continuous expanse of East Everglades wetlands to the north.

The Senior Corp. site consists of a 132 acre parcel, a 30 acre parcel and a 150 acre parcel. The southernmost 132 acres (Section 7) of the Senior Corp. site is bordered by the L-31N canal to the east and the L-31W canal to the south, by wetlands to the west and by the 30 acre portion (Section 6) of the Senior Corp. site and an approximately 1/4 mile wide strip of wetlands to the north. The strip of wetlands separates the 132 acre site from agriculture to the north. The 30 acre portion of the Senior Corp. site (Section 6) is bordered on the south by Section 7 and the aforementioned strip of wetlands, on the north by agricultural land and on the east and west by wetlands. The northernmost 150 acres (Section 30) of the Senior Corp. site are bordered on the east by SW 232nd Avenue, on the south by agricultural land and on the north and west by wetlands. All three wetland areas of the Senior Corp. site are adjacent to a continuous expanse of East Everglades wetlands. The site descriptions of the Rem, Becker and Senior Corp. sites contained within the RD are substantiated by numerous field visits conducted by representatives of EPA, the U.S. Fish and Wildlife Service (FWS) and the Dade County Department of Environmental Resources Management (DERM) over a five year period.

To summarize, Rem, Becker and Senior Corp. sites together encompass some 432 acres of seasonally inundated graminoid prairie wetlands with irregular rocky limestone substrates, typical of wetlands on the eastern margin of Taylor Slough. The dominant vegetative community found on these sites is described as wetland prairie, muhly/muhly-beardgrass in the Dade County East Everglades Management Plan. The wetland prairie surface is vegetated primarily by muhly grass (Muhlenbergia capillaris) along with yellowtop (Flaveria linearis), Pluchea spp., Dichromena colorata, Aristida spp. and Hypericum spp.. Solution holes are common throughout these sites with depths of one to three feet below the rocky substrate. The dominant wetland plant species in the solution holes is sawgrass (Cladium jamaicensis) in association with arrowhead (Sagittaria lanceolata), pickerelweed (Pontederia spp.) and spike rush (Eleocharis spp.). Scattered throughout the Rem, Becker and Senior Corp. sites are hardwood tree hammocks which are vegetated predominantly by red bay (Persea borbonia), wax myrtle (Myrica conifera), willow bastic (Dipholis salicifolia) and cocoplum (Chrysobalanus icaco) with some infestation of the exotics, Brazilian pepper (Shinus terebinthifolius) and Australian pine (Casuarina spp.). The Rem and Senior Corp. sites also contain another type of tree island known as a willow head, vegetated predominantly by willow (Salix caroliniana). Numerous field visits conducted by EPA, FWS and DERM personnel have confirmed the presence of standing water and periphyton in the solution holes. Periphyton is an association of blue-green algae which is the basis of the wetland prairie food web. These field visits also revealed a layer of marl soil over portions of the Rem, Becker and Senior Corp. sites as well as a thin layer of periphyton occurring over much of the rocky ground surface during the summer rainy season. During consultation, Senior Corp. representatives stated that while there was groundwater containing algae and fish, in the solution holes, the wetland prairie surface was predominantly dry and exhibited no periphyton mat or surface water. As previously stated numerous field visits have confirmed the presence of periphyton over much of the Senior Corp. site, as well as the Rem and Becker sites, which confirms inundation of the surface.

I concur with the RD that the Rem, Becker and Senior Corp. sites provide wetland functions typical of the prairie wetlands of East Everglades. These include: fish and wildlife habitat, food chain production, groundwater recharge, water storage and biological and geochemical nutrient and pollutant uptake. In addition, I concur that these sites have recreational value as sites for bird watching and other nature study although the administrative record does not indicate that these sites are extensively utilized for this purpose. Recreation, in the form of bird watching and other passive recreation, appears in south Florida to be concentrated in ENP and other federal and state managed areas.

I will elaborate on the the fish and wildlife habitat aspect of Rem, Becker and Senior Corp. sites in the next section.

### C. Fish and Wildlife

General information on wildlife utilization of the prairie wetlands of East Everglades is largely provided by the wildlife report prepared in December 1979 in conjunction with the East Everglades Planning Project (EPPP) and in

support of the EEMP. The information in the report is based upon literature research as well as data collected during the course of the study. The data are presented in a table which lists East Everglades wildlife species' use of prairie wetlands and seven other habitat types of East Everglades. The report also contains a table which lists the endangered and threatened species as well as species of special concern that occur in East Everglades. This table has been updated through subsequent coordination. The species in this table have been listed by either the federal government (U.S. Department of the Interior (DOI)), the State of Florida or the Florida Committee on Rare and Endangered Biota (FCREB). The FCREB was formed as a result of the State of Florida's concern for the preservation of its flora and fauna. The group is sponsored by the Florida Audubon Society and Florida Defenders of the Environment and the publishing of its findings was funded by and on behalf of the Florida Game and Freshwater Fish Commission. Although this group has no statutory mandate or regulatory authority, it is comprised of scientists as well as representatives from federal, state and local government agencies and academic institutions who are considered experts in their respective fields and its findings are highly respected and incorporated into regulatory actions. Therefore, the FCREB list of endangered and threatened species and species of special concern has been incorporated into my findings as appropriate. For the purposes of this FD, these tables have been adopted and consolidated into Table 1.

Information concerning wildlife observations more specific to the wetland sites at issue was obtained from two sources. First, the aforementioned wildlife report contains figures which depict general locations where certain wildlife species were sighted during the course of the study. While these figures are not specific to the sites at issue, they do indicate that certain wildlife species were observed in the vicinity of the Rem, Becker and Senior Corp. sites. These observations are discussed in the text but are not incorporated into Table 1.

Second, information was received from Dr. George H. Dalrymple, Associate Professor of Biology of the Florida International University. Dr. Dalrymple originally responded in support of EPA Region IV's proposed 404(c) Determination and stated that he was familiar with the wetland sites at issue. Upon request from my staff, he reviewed Table 1 and indicated which species he had observed. Dr. Dalrymple has conducted studies in the Everglades and has spent more than ten years studying the ecology of the East Everglades area. I believe he is qualified to provide accurate information on observed wildlife. I wish to clarify that Dr. Dalrymple's observations were not made in conjunction with this 404(c) action; therefore, they are not limited to the wetland sites at issue. However, he has stated that his observations were made either on the Rem, Becker or Senior Corp. sites or on similar adjacent prairie wetland tracts. Because of the similarity of the sites and lack of barriers between them, I believe that all of his observations are relevant to the wetland sites at issue.

To summarize, Table I lists the species which occur, or have a high probability to occur, in East Everglades and on the wetland sites at issue. Those species which are indicated as probably present in East Everglades resulted from literature research conducted in conjunction with the EEMP wildlife study.

Those species indicated as observed on or in the vicinity of the wetland sites at issue, were observed by Dr. Dalrymple on the Rem, Becker or Senior Corp. sites or on similar adjacent wetlands within the past two years. The remainder of the list are species observed in East Everglades prairie wetlands during the EPPP wildlife study.

The RD and the administrative record indicate that the periphyton-based food web produced within wetland prairies of East Everglades provides a valuable food source for reptiles, mammals and wading birds. During the wet summer months, water accumulates in the solution holes and provides an opportunity for periphyton communities to flourish. Within the seasonally flooded solution holes and regularly flooded willow heads, the periphyton-based food web supports valuable prey species such as snails, aquatic insects, crayfish, tadpoles, frogs, snakes, turtles, mosquitofish, killifish, flagfish, sunfish and other small fish. As the wet season progresses and groundwater inundates the prairie surface, these prey species substantially expand their populations and disperse across the prairie. Then, as the wet season ends, receding water levels concentrate these prey species populations in the solution holes and willow heads and provide a convenient food source. Numerous field visits have documented the presence of aquatic food source organisms such as crayfish, tadpoles, several species of minnows, snails and aquatic insects as well as a periphyton cover over much of the wetland surface at the Rem, Becker and Senior Corp. sites. This indicates that the generation, expansion and subsequent concentration of these food source organisms occurs on the wetland sites at issue. In addition, frogs and toads (which occur most frequently during the wet season) and rats and mice (which are most common during the dry season) provide a forage base for larger mammals and raptors. The prairie provides browsing areas for whitetail deer, which are the primary food species for the Florida Panther. The aforementioned forage species as well as whitetail deer have been observed either on the Rem, Becker or Senior Corp. sites or in similar adjacent wetland areas.

As previously mentioned, Table 1 lists the species which occur, or have a high probability to occur in the prairie wetlands of East Everglades and in the wetland sites at issue. The list includes a variety of fish, amphibians, reptiles, mammals and birds including wading birds, songbirds, raptors and waterfowl. Table 1 indicates that the prairie wetlands of East Everglades provide habitat for 16 species of fish, 15 species of amphibians, 27 species of reptiles, 18 species of mammals and 77 species of birds. Of these, 11 species of fish, 12 species of amphibians, 21 species of reptiles, 10 species of mammals and 51 species of birds have been observed on or adjacent to the wetland sites at issue.

The list includes the Florida Panther and the Cape Sable Sparrow which are species listed as endangered by the DOI the State of Florida and the FCREB. The endangered status of these species is due, in whole or in part, to the loss or alteration of habitat. As the RD states, a radio-collared male Florida Panther was tracked across the Rem, Becker and Senior Corp. sites. Recent discussions with Michael Finley, Superintendent for ENP, revealed: that this is an adult male panther which has frequented East Everglades, including the Rem, Becker and Senior Corp. sites, and which seems to have incorporated

these areas into his home range; that this is the only male of the species known to EMP biologists and that his survival is considered vital to the remaining panther population; and that three additional female panthers have been tracked into East Everglades. In addition, the aforementioned Everglades Status Report states that fewer than 50 Florida Panthers survive in the Everglades region, making it one of the most endangered species on earth. DOI determined that the wetlands of the Rem and Senior Corp. sites are not critical habitat for the Cape Sable Sparrow and that rockplowing these areas would not jeopardize its existence. The EEPP wildlife report states that Cable Sable Sparrow nests in prairie wetlands, that its continued existence appears to be dependent upon this wetland type and that there were Cape Sable Sparrow sightings west of the Rem and Becker sites during the study period. In addition, discussions with NPS personnel indicated that portions of the wetland sites at issue still appear to be appropriate Cape Sable Sparrow habitat, although no individuals have been recently sighted there. I conclude from this information that the Rem, Becker and Senior Corp. sites continue to provide potential habitat for this species.

The list includes the Wood Stork which is considered endangered by the DOI, the State of Florida and the FCREB. Discussions with NPS personnel and Dr. Dalrymple revealed that the Wood Stork would be expected to occasionally utilize the wetlands sites at issue for foraging. The administrative record indicates that the population of southern Florida Wood Storks has been decreasing due to among other factors, the loss and/or alteration of suitable foraging habitat.

Also included in the list are the Eastern Indigo Snake and the American Alligator which are species listed as threatened by the DOI and as species of special concern by the FCREB. The State of Florida lists the Indigo Snake as threatened and the American Alligator as a species of special concern. The Eastern Indigo Snake has been observed on or adjacent to the wetland sites at issue. Review of the aforementioned figures in the EEPP wildlife report showing the distribution of wildlife sightings indicates that there were alligator sightings as well as observations of an alligator nest site and active alligator ponds near the Senior Corp. site. In addition, evidence of alligator activity has been observed in larger solution holes on and adjacent to the Senior Corp. site within the past two years.

Table 1 also includes American Kestrel, White-crowned Pigeon and the Burrowing Owl. The populations of the first two species are considered threatened by the State of Florida and the FCREB and the Burrowing Owl is of special concern to the State and the Committee. Both American Kestrel and Burrowing Owl have been observed on or adjacent to the wetland sites at issue.

Included in the list are 12 species of wading birds which were observed on or adjacent to the wetland sites at issue within the last two years. In addition there is evidence of historic use of the general area by wading birds. There were sightings of Glossy Ibis, Great Egret, White Ibis, Louisiana Heron, Little Blue Heron and Least Bittern, in the vicinity of the Rem, Becker or Senior Corp. sites during the EEPP wildlife study.

The report also indicates that during the study period, there was a wading bird nesting colony west of the Rem and Becker sites comprised of Cattle Egret, Little Blue Heron and Louisiana Heron, and a high concentration of wading birds, as well as a wading bird nesting colony west of the northern portion of the Senior Corp. site comprised of the aforementioned species as well as Black-crowned Night Heron and Yellow-crowned Night Heron. All of the aforementioned species, except the Glossy Ibis, have been observed on or adjacent to the wetland sites at issue within the last two years.

The list of recently observed wading bird species includes the Little Blue Heron, Louisiana Heron and Snowy Egret which are of special concern to the State of Florida and the FCREB. The list also includes the Black-crowned Night Heron, Great White Heron (actually a geographic color morph of the Great Blue Heron), Least Bittern, White Ibis and Great Egret which are of special concern to the FCREB. These observed species are of special concern to the State of Florida and/or the FCREB because of population declines which are attributed in whole or in part, to the loss of food and/or feeding habitat which the Rem, Becker and Senior Corp. sites provide. Comments of the NPS and the EEPF wildlife study indicate: that wading birds (herons, egrets, ibis) are a mobile wildlife component of south Florida that have been observed commonly flying into East Everglades from ENP; that peripheral wetlands, like those of East Everglades and the wetlands at issue, are important wading bird feeding sites early in the dry season; that as the dry season progresses wading birds feed in East Everglades prairie wetlands and move westward in East Everglades and into the marshes of ENP. As the RD indicates, the reproductive cycles of many of the Everglades wading bird and other predatory species are closely tied to the aforementioned seasonal pulses of concentrated, easily consumed aquatic prey species.

Review of the RD and the administrative record revealed that the wetlands of the Rem, Becker and Senior Corp. sites, with their characteristic solution holes, hardwood tree hammocks and willow heads, provide a diverse habitat that satisfies the habitat needs of a diverse wildlife population. I also conclude that because these wetlands are seasonally inundated and provide a seasonally concentrated forage fishery, that the Rem, Becker and Senior Corp. sites provide an essential wetland habitat component of, and provide habitat diversity for, the south Florida wetlands ecosystem. Wildlife habitat is regarded as continuous within East Everglades and ENP with mobile wildlife species, such as wading birds, alligators, deer and the Florida Panther moving freely between these areas to satisfy their habitat requirements. As Table 1 indicates, there are numerous mobile wildlife species which utilize East Everglades that have been observed on or adjacent to the Rem, Becker or Senior Corp. sites and similar adjacent prairie wetlands. Many of these species for which the Rem, Becker and Senior Corp. sites provide essential habitat needs have suffered population declines due in whole or in part to the loss and/or alteration of habitat, which resulted in their listing with the DOI, State of Florida and/or the FCREB.

Table 1: East Everglades Wildlife Use of Prairie Wetlands (Adapted from Table 2 and Table 5 of the Final East Everglades Planning Project Wildlife Report, December, 1979). FE = Federally Endangered; FT = Federally Threatened; SE = State Endangered; ST = State Threatened; SC = State Special Concern FCE = Florida Committee Endangered; FCT = Florida Committee Threatened; FCSC = Florida Committee Special Concern \*\* = Species probably present; \* = observed on or adjacent to Rem, Becker or Senior Corp. sites. The seasonal status of birds is shown by R = year-round resident; S = present in summer; W = present in winter; M = present as a migrant.

### Fishes

Yellow Bullhead*	Mosquitofish*
Walking Catfish*	Least Killifish*
Bluefin Killifish	Sailfin Molly*
Seminole Killifish	Warmouth*
Marsh Killifish	Spotted Sunfish*
Golden Topminnow*	Dollar Sunfish*
Sheepshead Minnow*	Blue-spotted Sunfish
Flagfish*	Black Acara

### Amphibians

Everglades Dwarf Siren	Little Grass Frog**
Southern Toad*	Florida Chorus Frog
Oak Toad*	Florida Cricket Frog*
Squirrel Treefrog*	Pig Frog*
Green Treefrog*	Southern Leopard Frog*
Greater Siren*	Cuban Treefrog*
Two-toed Amphiuma*	Greenhouse Frog*
	Eastern Narrow-mouthed Toad*

### Reptiles

Snapping Turtle*	Eastern Coachwhip**
Eastern Glass Lizard**	Eastern Indigo Snake FT; ST; FCSC;*
Island Glass Lizard*	Corn Snake*
Slender Glass Lizard**	Rat Snake*
Six-lined Racerunner**	Florida Kingsnake*
Florida Brown Snake*	American Alligator FT; SSC; FCSC
Eastern Garter Snake*	Striped Mud Turtle*
Penninsula Ribbon Snake*	Green Anole*
Ground Skink*	Brown Anole*
Southeastern Five-lined Skink*	Dusky Pygmy Rattlesnake*
Florida Water Snake*	Eastern Diamondback Rattlesnake*
Striped Swamp Snake*	Florida Cottonmouth
Southern Ringneck Snake*	
Southern Black Racer*	
Rough Green Snake*	

Table 1 (continued)

Mammals

Opposum\*  
Shorttail Shrew\*\*  
Least Shrew\*\*  
Eastern Yellow Bat\*\*  
Evening Bat\*\*  
Freetail Bat\*\*  
Marsh Rabbit\*  
Rice Rat  
Cotton Mouse\*  
Hispid Cotton Rat\*

House Mouse\*  
Gray Fox\*  
Raccoon\*  
Spotted Skunk\*\*  
Striped Skunk\*\*  
Florida Panther FE; SE; FCE;\*  
Whitetail Deer\*  
Bobcat\*

Birds

Pied-billed Grebe (R)  
Anhinga (R);\*  
Great Blue Heron; (R);\* (Note 1)  
Northern Green Heron (R);\*  
Little Blue Heron (R); SSC; FCSC;\*  
Great Egret (R); FCSC;\*  
Snowy Egret (R); SSC; FCSC;\*  
Louisiana (Tricolored) Heron (R); SSC; FCSC;\*  
Black-crowned Night Heron (R);FCSC ;\*  
Yellow-crowned Night Heron (R);\*  
Least Bittern (R); FCSC;\*  
White Ibis (R); FCSC;\*  
American Green-winged Teal (W);\*\*  
Turkey Vulture (R);\*  
Black Vulture (R)  
Sharp-shinned Hawk (W);\*  
Red-shouldered Hawk (R);\*  
Short-tailed Hawk (R);\*  
Marsh Hawk (W);\*  
Osprey (R);\*  
Merlin (W)  
Bobwhite (R);\*  
Limpkin(R);\* ;SSC  
Virginia Rail (W);\*  
Sora (W);\*  
Killdeer (R);\*  
Common Snipe (W);\*  
Spotted Sandpiper (W)  
White-Crowned Pigeon (R); ST; FCT  
Mourning Dove (R);\*  
Smooth-billed Ani (R);\*  
Short-eared Owl (W);\*\*  
Burrowing OWL (M,W); SSC; FCSC;\*

Tree Swallow (W);\*  
Bank Swallow (M)  
Rough-winged Swallow (M);\*\*  
Barn Swallow (W);\*  
Cliff Swallow (M);\*\*  
Purple Martin (S);\*  
Common Crow (R);\*  
House Wren (W);\*  
Long-billed Marsh Wren (Marsh Wren) (R)  
Short-billed Marsh Wren (Sedge Wren) (W)  
Northern Mockingbird (R);\*  
Blue-gray Gnatcatcher (W);\*  
Loggerhead Shrike (R);\*  
Palm Warbler (W);\*  
Common Yellowthroat (R);\*  
Bobolink (M)  
Eastern Meadowlark (R);\*  
Red-winged Blackbird (R);\*  
Boat-tailed Grackle (R);\*  
Common Grackle (R);\*  
Indigo Bunting (W);\*\*  
Painted Bunting (W);\*\*  
Dickcissel (W);\*\*  
Rufous-sided Towhee (R);\*  
Savannah Sparrow (W);\*  
Sharp-tailed Sparrow (W);\*\*  
Seaside Sparrow (W);\* (Note 2)  
Vesper Sparrow (W);\*\*  
Lincoln's Sparrow (W);\*\*  
Swamp Sparrow (W)  
Song Sparrow (W);\*  
Cape Sable Sparrow FE, SE; FCE (Note 2)  
Grasshopper Sparrow (W);\*\*

Table 1 (continued)

Common Nighthawk (S);*	Ground Dove (R)
Eastern Kingbird (S);*	Carolina Wren (R);*
Eastern Phoebe (W);*	Gray Catbird (W)
Cattle Egret (R);*	
American Kestrel (R); ST; FCT;*	
Glossy Ibis (R); FCSC	
Great White Heron (R); FCSC;* (Note 1)	
Wood Stork (R); FE; SE; FCE	
Swallow-tailed Kite (S)	
Red-tailed Hawk (R)	

Notes

1. Great White Heron and Great Blue Heron are the same species.
2. The Cape Sable Sparrow is a subspecies of the Seaside Sparrow.

#### IV. ADVERSE EFFECTS OF PROPOSED ROCKPLOWING

Review of the RD and the administrative record revealed that the RD provides an accurate evaluation of the site specific and cumulative impacts that will result from proposed rockplowing activities. I hereby adopt Sections IV and VII (pages 14-16 and 30-33) of the RD except for the conclusions with respect to unacceptable adverse effects to fishery and recreational areas. What follows is a summary of the substantive points in the RD and additional discussion that I feel is pertinent to EPA's findings in this case. I will briefly discuss those instances where my findings differ from those in the RD.

I did not rely upon the Region's discussion concerning the precedential nature of this Section 404(c) action. The RD states that permitting rockplowing of the Rem, Becker and Senior Corp. sites may be viewed as a precedent encouraging future wetland conversion proposals resulting in additional losses of East Everglades wetland resources. However, Section 404(c) is by its terms related to the use of specific, defined sites. It requires a case-by-case finding of effects on the relevant statutory resources that would result from a discharge of fill on a specific site, taking into account cumulative impacts.

##### A. Impacts

Rockplowing of the Rem, Becker and Senior Corp. sites will result in the conversion of 432 acres of prairie wetlands to agricultural areas with the irreversible loss of the characteristic irregular wetland surface, solution holes and wetlands vegetation (hardwood tree hammocks would be preserved in accordance with DERM requirements). This will result in the loss of fish and wildlife habitat and food chain production and adverse impacts to groundwater and surface water quality by eliminating the nutrient and pollutant assimilation capabilities of the native wetlands vegetation and introducing nutrients, pesticides and herbicides through subsequent agricultural activities. The groundwater recharge and water storage functions of these sites will remain. As I previously mentioned, recreation, in the form of bird watching and other passive recreation, in south Florida appears to be concentrated in ENP and other federal and state managed areas. Therefore, while I conclude that potential recreational opportunities will be affected by rockplowing these sites, I do not believe that the loss of these sites represents a significant impact to recreation, especially since they are privately owned.

Less mobile species, such as the aforementioned aquatic food source organisms, fish, amphibians and small reptiles and mammals will perish as the site is rockplowed. This will result in the loss of the seasonal food source for wading birds, reptiles and mammals as well as the rodents, amphibians and reptiles which provide a food source for other species such as raptors and larger mammals. These losses could include the federally threatened Eastern Indigo Snake. As the RD indicates, this forage base will be replaced by one which is less diverse and will not generally support the diverse trophic levels of wildlife. I concur with the RD that the forage fishery of the Rem, Becker and Senior Corp. sites is important; however, I

believe the significance of its loss is realized in the higher trophic levels, such as wading birds, which depend upon the seasonal availability of this forage fishery.

Local mobile species will migrate to adjacent habitats. Review of Table 1 indicates that rockplowing the Rem, Becker and Senior Corp. sites will displace a variety of wildlife species. Displaced wildlife will perish or compete for adjacent habitats thus displacing wildlife which already occupies those areas. While it is probable that displacement does not equal mortality for all individuals, it is not safe to assume that all that are displaced will simply survive somewhere else. The degree of stress to any individual, and cumulatively to the population, of that species depends upon what life needs the habitat is providing and, in particular, how prevalent that habitat is. For example, these sites provide a seasonal concentration of food source species that is utilized by wading birds. As previously stated, 12 species of wading birds have been observed on the Rem, Becker or Senior Corp. sites or on similar adjacent wetland tracts. These include nine species of special concern to the State of Florida and/or the FCREB.

Correspondence in the record from NPS indicates: that colonial wading birds (herons, egrets and ibis) are among the most mobile species utilizing East Everglades and have been observed commonly flying into East Everglades from ENP throughout the year; that the Everglades populations of wading birds such as egrets, wood storks and white ibis have suffered significant population declines due primarily to the loss of food and feeding habitat as a result of induced hydrological changes in the Everglades; that numbers of nesting wading birds in ENP have declined by about 90% since the 1930's due to the loss of food and feeding habitat, among other factors; that a paper prepared by three biologists with more than 65 years of combined experience in the Everglades stated that any further deterioration of wetlands south of Tamiami Trail (this area includes the wetland sites at issue) will assure further losses in southern Florida breeding populations of wading birds. Therefore, impacts to wading birds from rockplowing the subject wetland areas are likely to be significant.

Four Florida Panthers have been tracked to East Everglades; one male of this species has been tracked several times across the Rem, Becker and Senior Corp. sites. Panthers' habitat needs and ranging habits are not well understood, which is why the radio-collar tracking experiment is underway. The male panther at issue is wide ranging with a "home" range of over 200 square miles which includes East Everglades and ENP. The size of this range suggests that all of the habitats within that range may provide basic habitat needs for this species. During consultation, Senior Corp.'s representatives stated that it had not been proven that rockplowing would adversely affect this species and suggested that rodents in rockplowed areas might be an alternative food source. I believe that there is currently insufficient information available to identify or assess the degree and scope of these impacts. Rockplowing these sites will destroy browsing habitat for whitetail deer which is the primary food species for the Florida Panther. Given that this species is listed as endangered by DOI, the State of Florida and the FCREB, extreme caution should be exercised before areas utilized by this species are altered. There is no evidence to suggest that encouraging the panther to enter actively farmed areas is a solution.

Review of the RD and the administrative record indicated that rockplowing the Rem, Becker and Senior Corp. sites will contribute to the loss of habitat diversity in the Everglades system. Comments of the NPS and other technical documentation reveal that ENP and East Everglades share biological and hydrological connections and that wildlife habitats are essentially continuous between the two areas for mobile species. The NPS has commented that because ENP wildlife depend upon East Everglades habitats, ENP wildlife populations are damaged when wetlands outside the park are damaged. As Table 1 indicates, prairie wetlands provide habitat for a healthy mix of mobile species and a number of these species have been observed either on the Rem, Becker or Senior Corp. sites or on similar adjacent wetland tracts.

#### B. Cumulative Impacts

In its documentation in support of the Rem permit, the Corps confined its assessment of cumulative impacts to those arising from activities subject to the Section 404 regulatory program. That is, the Corps considered the potential for other sites to have the same characteristics, such as juxtaposition to agricultural areas, which led to the Rem permit decision and which therefore could result in authorization of future rockplowing permit applications; the Corps also provided a cumulative review of issued permits and the involved wetland acreages in East Everglades. However, these represent only part of the cumulative impacts picture. I believe that to provide an accurate assessment of the cumulative impacts of the loss of wetlands resources requires consideration of the collective historical losses of those resources due not only to the discharge of fill material but also to other factors, and that such an approach is consistent with Section 230.11(g) of the Section 404(b)(1) Guidelines.

There have been significant losses of prairie wetlands of East Everglades. Review of the RD and the administrative record indicates that approximately 8,000 of the original 25,000 acres of East Everglades prairie wetlands in the area south of Tamiami Trail, which includes the wetland sites at issue, have been lost or disturbed as a result of rockplowing, drainage and residential development. Rockplowing an additional 432 acres of the prairie wetlands on the Rem, Becker and Senior Corp. sites will contribute to this loss. This will also contribute to the cumulative loss of habitat diversity within the Everglades system, which the wetland sites at issue provide.

From a wildlife perspective, the most significant cumulative impacts will be experienced by the previously discussed mobile species which utilize prairie wetlands in conjunction with other habitats. Wading birds, which depend upon these areas for a seasonal feeding habitat, have already suffered large population declines in the Everglades and significant declines in nesting numbers in ENP due in whole or in part to loss of food and feeding habitat. There are 12 species of wading birds that were either observed on the wetland sites at issue or in adjacent, similar prairie wetlands. Nine of these species are of special concern to the State of Florida and/or the FCREB because of loss and/or deterioration of habitat. Rockplowing the wetland sites at issue will contribute to cumulative adverse impacts to these species. Rockplowing these areas will contribute to the cumulative loss of habitat of the Florida Panther whose endangered status is attributed to habitat losses, among other factors.

## V. CONCLUSIONS AND FINDINGS

This Final 404(c) Determination addresses unacceptable adverse effects to wildlife. The 404(c) regulations define unacceptable adverse effect as an impact on an aquatic or wetland ecosystem which is likely to result in significant degradation of municipal water supplies or significant loss or damage to fisheries, shellfishing, wildlife habitat or recreation areas. Under Section 231.2(e) of the 404(c) regulations, the evaluation of the unacceptability of such impacts should consider the relevant portions of the Section 404(b)(1) Guidelines.

Those portions of the Guidelines relating to significant degradation of waters of the U.S. (40 CFR 230.10(c)) and to the determination of cumulative effects on the aquatic ecosystem (40 CFR 230.11(g)) are of importance to evaluating the unacceptability of environmental impacts in this case. Compliance with the Guidelines requires that no discharge of dredged or fill material shall be permitted if it causes or contributes to significant degradation of waters of the U.S.. Effects contributing to significant degradation include but are not limited to the loss of fish and wildlife habitat or the loss of a wetland's capacity to assimilate nutrients. Compliance with the Guidelines also requires that the permitting authority consider information concerning cumulative impacts during the decision-making process. Thus, it is appropriate, within the context of my Final Determination, to take into account cumulative losses of fish and wildlife habitat in deciding whether proposed rockplowing will result in significant degradation.

Review of the RD and the administrative record revealed that the Rem, Becker and Senior Corp. sites exhibit wetland functions typical of East Everglades prairie wetlands despite a shortened hydroperiod due to their proximity to adjacent canals. These sites contribute to the wildlife habitat diversity of the Everglades and provide seasonal wetland habitat that is essential to the mobile species of the Everglades wetlands system. As Table 1 indicates, the Rem, Becker and Senior Corp. sites provide habitat for a healthy mix of species which includes 12 species of wading birds (nine species which are of special concern to the State of Florida and/or the FCREB) which have experienced significant declines in population due in part to the loss of food or feeding habitat which these wetlands provide. Also included in Table 1 is the endangered Wood Stork which has also experienced significant population declines due, in part, to the loss of foraging habitat. Table 1 also includes the American Alligator which is on the federal threatened list and of special concern to the State of Florida and the FCREB.

I conclude that the Rem, Becker and Senior Corp. sites provide important wildlife habitat which would be largely destroyed if the sites are rockplowed as proposed. EPA's review also revealed that there have been significant cumulative losses of East Everglades prairie wetlands and that these losses have been linked to the decline of some species in this region and that rockplowing these three sites would aggravate the effect of these losses. I therefore conclude that, considering site specific and cumulative impacts, rockplowing these wetland sites will result in unacceptable adverse effects to wildlife for the purposes of Section 404(c) of the CWA.

In the present case, my finding of unacceptable adverse effects is based upon anticipated losses of valuable wildlife habitat that will result from direct effects of particular discharges regulated under Section 404 of the CWA, considered within the context of past losses. However, my review of the RD, the record of Region IV's public hearing, and the ESR also revealed a substantial interest on the part of all levels of government in the ecological integrity of the south Florida wetlands ecosystem of which these sites are a part, and a number of studies and regulatory programs designed to address the maintenance of and improvements to this system. Earlier study and planning programs which culminated in preparation of the EEMP (and the corresponding zoning ordinances through which its conclusions and findings are implemented) and the ENP-EERPMIP focused on the ecological values and land uses of East Everglades, as well as the relationship of the area to other surrounding wetland environs such as ENP. In particular, the EEMP effort provided a very comprehensive and much needed data base concerning the various wetland habitats of East Everglades and their associated fish and wildlife assemblages. The Save Our Everglades Program was initiated in 1983 to restore and protect the values of the Kissimmee River-Lake Okeechobee-Everglades System. This program has provided the impetus for a number of studies and programs (some of which I briefly discuss in this Final Determination) designed to improve and restore ENP and its wildlife support functions. As has been demonstrated the prairie wetland sites at issue provide wildlife habitat that is utilized by the mobile species of ENP and, indeed, provide essential habitat for some of them. I believe, therefore, that rockplowing the 432 acres of wetlands at issue would not only result in unacceptable site specific and cumulative impacts to wildlife based upon existing environmental circumstances, but is also contrary to ongoing efforts to improve and restore the Everglades' ecological functions which include support of a rich and diverse wildlife population.

VI. RESTRICTION ON USE OF THE REM, BECKER AND SENIOR CORP. SITES  
FOR SPECIFICATION AS DISPOSAL SITES

Section 404(c) authorizes EPA to impose different limitations on discharges through actions on disposal site specifications. Where the facts warrant I may recommend that any defined area be prohibited from specification as a disposal site pursuant to Sections 404(a) and (b). If I should determine that the discharge of certain materials will have significantly less damaging effects than others, or that limiting discharges by amount, method, and/or location will reduce the likelihood of unacceptable adverse effects, I may recommend that the use of a specified site merely be restricted in some manner or that the restriction or prohibition apply to only a portion of the area under consideration.

Based upon my finding that proposed rockplowing would result in unacceptable adverse effects to wildlife and under the authority delegated to me by the Administrator, I hereby restrict the designation of the Rem, Becker and Senior Corp. sites as discharge sites for rockplowing. This 404(c) action does not address proposed filling activities in support of less consumptive uses of these sites.

15 June 1988  
Date

Rebecca W. Hanmer  
Rebecca W. Hanmer  
Acting Assistant Administrator  
for Water