



IN REPLY REFER TO

N22

SEP 12 1986

John R. Hall
Chief, Regulatory Branch
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Hall:

Enclosed is the signed and completed joint NPS/COE permit (USACOE permit no. 199301691), and Statement of Findings for same.

We thank the Corps for its support of this important project and in helping to prepare the joint Permit, Statement of Findings and Environmental Assessment (EA). We have reviewed the permit and the EA, and as agreed we have added a supplement on the issues that Everglades National Park deemed essential to incorporate into the joint EA regarding National Park Service criteria for NEPA compliance and review. We are implementing the permit as originally approved.

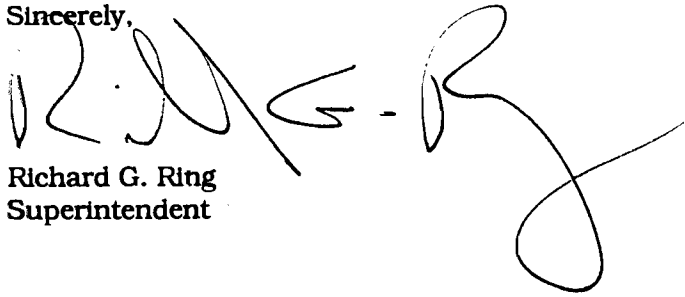
However, in light of new information which is discussed in our supplement to the joint EA, and in light of the adaptive management approach we have taken regarding implementation of this project, we will be temporarily stockpiling the substrate within the HID site instead of hauling the substrate out of the Park. We plan to evaluate possible alternatives for permanently depositing the soil within the HID site, and will develop an environmental assessment to address this opportunity over the next 12-24 months. Upon completion of the EA to evaluate within HID site deposition, we will request any appropriate modifications to the existing permit.

The EA supplement incorporated into the existing joint agreement fully discusses this future evaluation, and outlines the particulars. We included Alternative 2 - Within Site Disposal, simply for informational purposes regarding a conceptual design for within HID site permanent disposition of the substrate. We have also decided that we will not be developing the overlook mounds.

Keeping in mind our adaptive management approach to this long-term project we anticipate that as the project continues we will consider future alternatives and modifications. As we deem any modifications to be important enough to implement, we will continue fulfilling the regulatory process to modify both the State DEP, and Wetland 404 permits, and satisfy NEPA and other pertinent regulatory requirements.

Thank you for your support of this important project and for the efforts you have contributed toward it's success. We look forward to continuing our cooperation with you on this long-term project as we proceed with implementation.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. G. Ring', with a large, stylized flourish extending from the end.

Richard G. Ring
Superintendent



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019



REPLY TO
ATTENTION OF
Construction-Operations Division
Regulatory Branch
South Permits Section
199301601(IP-OC)

MAR 12 1996

Everglades National Park
Attn: Mr. Robert Doren
P.O. Box 279
Homestead, Florida 33030

Dear Mr. Doren:

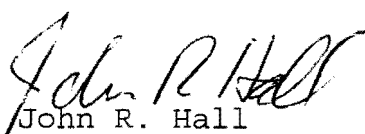
Enclosed is an original and a copy of an unsigned Department of the Army permit instrument.

Both copies must be signed by the applicant in the space provided on the last page of the instrument. In the case of corporations, acceptance must be by an officer of that corporation. Type or print the name and title of the person signing below the signature and the date signed. This indicates that the applicant accepts the provisions and conditions of the permit. Your attention is drawn to the special conditions included on page 2 of the permit. In accordance with General Condition number 5 on page 2 of the permit, a copy of the specific conditions stated in the water quality certification has been attached and therefore becomes a part of the Department of the Army permit.

SIGN AND RETURN BOTH THE ORIGINAL AND THE COPY TO THIS OFFICE.

The original will be signed by the District Engineer and returned to you with a placard to be posted at the site. The permit is not valid until it is signed by the District Engineer.

Sincerely,


John R. Hall

Chief, Regulatory Branch

Enclosures

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

RESTORATION OF WETLANDS IN THE HOLE-IN-THE-DONUT EVERGLADES NATIONAL PARK

SUBJECT: Supplement to Department of the Army Environmental Assessment and Statement of Finding for Permit Application 199301691 (see appendix I).

BACKGROUND: A major site of exotic plant invasion within Everglades National Park is an area of former mesic prairie wetlands now called the "Hole-in-the-Donut" (HID) (see Appendix I and Appendix II for location maps). This area was intensively farmed for several decades using only crude mechanical soil preparation methods. In the early 1950's the process of rock-plowing was developed which crushes the natural limestone rock, producing a substrate much better suited for crops than the existing substrate. This artificial pedogenic process changed the area from primarily low nutrient, low oxygen conditions to higher nutrient, higher oxygen conditions which have been tied to increased susceptibility to exotic invasion. Approximately half of the "Donut" was rock-plowed (approximately 6,300 acres) and, since acquisition by Everglades National Park in 1975, has become dominated by a virtual monoculture of the exotic Brazilian pepper (*Schinus terebinthifolius*). Various techniques (planting, mowing, burning, bulldozing, substrate removal, etc.) have been tried in an attempt to restore this area to wetlands. Of these methods, only substrate removal has been effective in favoring succession toward native wetland vegetation (see appendix II exhibit B).

The overall purpose of the proposed project is to restore wetlands in the Hole-in-the-Donut through substrate removal. The restoration work in the "Donut" would be carried out to offset impacts from development within the Mitigation Service Area consisting of those portions of the Bird Drive Basin and North Trail Wetlands Basin identified in the April 27, 1993, Memorandum of Understanding between the Department of Environmental Protection and Dade County DERM. The project would excavate and remove approximately 4,849,680 cubic yards of material from the "Donut" over a period of 20 years.

The Hole-in-the-Donut area is designated as an area of potential wilderness addition. The 1978 Final Environmental Impact Statement for the Everglades National Park wilderness recommendation recognized that, "Although disturbance of the

natural environment has been severe, the National Park Service will attempt to promote revegetation by native plants and restoration of habitats for the wildlife of the pineland and sawgrass glades. The ecological restoration will rely heavily on the results of ongoing studies to determine the most effective management practices. Methods may involve the use of mechanized techniques. If the revegetation and habitat restoration are successful, these former agricultural lands will be designated wilderness."

With the exception of selected road corridors and the Long Pine Key Campground, park lands immediately north and adjacent to the "Donut" project area are designated as wilderness. Lands to the southeast of the project area, adjacent to and southeast of the Old Ingraham Highway, are also designated as wilderness. Park lands adjacent to and east of the Hidden Lake Road are designated as non-wilderness.

Although visitor use of the roads in the project area is not prohibited, there are no visitor facilities or major attractions in the project area, and therefore visitor use of the area is light. The Long Pine Key Campground and Picnic Area are located less than a mile to the north of the northern boundary of the project area. Vehicle access to the Long Pine Key facilities is from the Main Park Road outside of the project area. Although visitation to Everglades National Park is year-round, the primary visitor use season is from approximately late November through April.

Visitor use of the roads in the project area consist of the occasional bicyclist, hiker, and lost tourist vehicle, with the exception of the Hidden Lake Road which receives a consistent volume of traffic associated with approximately 500 to 700 students and kids, attending 19 to 25 camps annually held at the Hidden Lake Environmental Education Center during the months of January through April. The South Florida Boy Scouts of America make occasional use of the Research Road to access a primitive campground located on an inholding adjacent to the project area. The majority of the vehicle traffic on the Research Road is generated by park employees and people having business at the park offices/facilities (Iori Building, Dan Beard Center, and the former Missile Base) located in the project area. The Research Road also provides access to the park's helipad.

In accordance with the regulations of the Council on Environmental Quality (40 CFR 1508.5) the National Park Service (NPS) requested by letter dated 23 June 1994, that the Department of the Army permit the NPS to participate as a cooperating agency

in the preparation of the Environmental Assessment (EA) and Statement of Finding (SOF) for permit application number 199301691 for mitigation in the "Hole-in-the-Donut" (HID) of Everglades National Park. The Department of the Army, Corps of Engineers (Corps), honored the park's request by letter dated 28 July 1994, citing the benefits of avoiding redundant compliance efforts. After review of the above referenced Environmental Assessment and Statement of Findings, and further evaluation of the impacts of the proposed project, the NPS has identified the following additional information necessary to fulfill NPS compliance responsibilities under the National Environmental Policy Act (NEPA).

The scope and purpose of this supplement to the environmental assessment is generally limited to the potential environmental consequences of substrate hauling and disposal alternatives. Of particular interest are the potential effects of hauling on park resources, wilderness values, visitors and infrastructure. The attached memorandum of record and this supplement together describe the proposed plan, its alternatives, environmental impacts, and the public comments that have been received and evaluated to date.

ALTERNATIVES:

OFF-SITE DISPOSAL ALTERNATIVE I

As originally proposed approximately 10 million cubic yards of material from 6,250 acres would have been excavated and removed from the park to be deposited in non-jurisdictional wetlands east of C-111 canal (not in the Frog Pond. This alternative also allows for on-site stockpiling. The project also would have placed 240,000 cubic yards of permanent fill over a total of 10 acres, all in former wetlands in the HID to construct from stockpiled material, 3 overlook mounds, each approximately 25 feet high and with parking space for +/- 30 automobiles.

The original proposal estimates assume approximately 1 truck trip every 4.6 minutes (276 seconds), 10 hours each day, six days per week for 5-6 months during soil hauling operation (December through May). This comes to 6453 truck trips for the first 125 acres (50 hectares) (year one average) of soil removal. Once the project increases to 250-375 acres (100-150 hectares) per year (year 2+) the number of truck trips would increase to between 13,000 - 16,000 during each construction period. This construction period (December through May) coincides with the peak of the park's visitor season.

Recent changes in overall hydrological restoration and water delivery models indicates a long-term increase in water levels in the C-111 and Shark Slough basins. After review of this issue and its possible impact on Park roads by the U.S. Army Corps of Engineers, a determination was made that the park roads, including the main Park road could not withstand repeated heavy traffic due to the Hole-in-the-Donut soil hauling. Estimates ranged between 2 and 4 years until the roads would be unusable and need to be completely rebuilt. Considering the amount of truck traffic it is assumed the entire 11 miles of road will need to be replaced.

The park is also concerned with safety considerations and liability relating to this high level of truck use on public roads, attendant road damage, and with how the project will affect visitor and employee use of the park and park facilities near the project. Specific concerns have been raised pertaining to the trucks using the same roads as visitors to the Royal Palm area and as employees using the Daniel Beard Center and Iori office facilities. While this has always been a concern, more recent and accurate assessments by the projects potential bidders, of truck volume increases the Park's awareness and apprehension. Consideration was given to whether or not the heavy truck use would prevent visitor use and enjoyment of the Royal Palm area, both by excluding visitor traffic during high activity periods of the project and by imposing a noise level in the area that visitors may find intrusive. While the magnitude of these disruptions to park visitors and employees are uncertain, and the project as originally proposed devotes substantial resources to traffic control and enforcement, the park has determined that this alternative is no longer considered workable and will not be advanced any further.

ON-SITE DISPOSAL ALTERNATIVE II

This alternative is provided solely for information purposes at this time. The basic project goal remains the same as originally proposed, that is to restore approximately 6,250 ac. of wetlands within the Hole-in-the-Donut area of Everglades National Park by removing exotic vegetation and excavating an average of 6 inches of soil to limestone base. However, rather than disposing of the material off-site this alternative would develop an on-site option for the use of the excavated material to create, over the 20 year life of the project, five to twelve upland forest sites and restore up to eight borrow pits to long hydroperiod wetlands within the project area (see Figure 1). Appendix II (state permit package and permit modifications) contains Florida DEP

approval of this conceptual plan.

This alternative would also permit stockpiling of the excavated materials on-site pending removal to the approved disposal sites for construction of the upland forest sites and filling borrow pits in accordance with the designs indicated in Appendix II. All forested uplands to be constructed using the excavated material would be on-site on former wetlands or uplands within the Hole-in-the-Donut. No existing wetland would be impacted for this work. Upon completion of grading the upland sites, they would be planted with native vegetation and maintained free of exotic plant species. The borrow pits would be restored to a depth that will ensure an adequate hydroperiod for wetland restoration. The borrow pits would also be maintained free of invasive exotic plant species.

The disposal mounds would be stabilized at the end of each construction season by planting non-invasive ground cover and maintained exotic free by periodic mowing. More elaborate contouring and revegetation plans, including those that would potentially benefit wildlife, would be done prior to completion of the mounds and in consultation with the Florida Game and Fresh Water Fish Commission, and the US Fish and Wildlife Service. The development of the on-site disposal options will continue to be evaluated to improve the options as new information is forthcoming.

This iterative evaluation is in keeping with the project's commitment to adaptive management. The park will be completing an all inclusive long-term management plan for the Hole-in-the-Donut over the next 12-24 months that will utilize an adaptive management approach and address all aspects of on-going operations and management, including water management practices, vegetation establishment, exotic and nuisance species control, fire management and control of access with regard to permanent on-site substrate deposition. The adaptive management approach provides a means of regularly re-evaluating methodologies, strategies, and processes, based on information and experience gained through project implementation, monitoring and field results; therefore, it is anticipated that the long-term management plan will need to be revised occasionally to reflect these refinements. As indicated above, further NEPA documentation, agency consultation, and public review will be prepared as appropriate for each future modification or refinement.

IMPLEMENT CURRENT PERMIT WITH TEMPORARY STOCKPILE OF SUBSTRATE ON-SITE - PREFERRED ALTERNATIVE

Temporarily stockpile HID substrate on-site (location #2 on Figure 1) over the first 18-24 months of the project. This is the selected alternative, and implements the existing permit without modification. This alternative also allows sufficient time for the evaluation and development of an on-site plan for substrate disposition. The stockpiling of substrate is currently permitted in the Department of the Army Environmental Assessment and Statement of Findings for Permit No. 199301691. During the construction of the temporary stockpile on-site, a supplemental Environmental Assessment (EA) would be conducted over the next 12-24 months, to assess the opportunities for developing on-site disposal alternatives for HID substrate. This supplemental EA would address on-site disposal options including; method(s), location(s), size(acres), height, configuration, sloping, and revegetation preferences. This supplemental EA will also address the use of borrow pits as disposal sites and will consider any wilderness or cultural values of possible on-site borrow pit disposal areas. The stockpile would be kept free of exotics.

ENVIRONMENTAL EFFECTS OF ON-SITE DISPOSAL ALTERNATIVE II

The environmental consequences section that follows addresses two points: 1) Temporary Stockpiling On-site - the Preferred Alternative, and evaluates the effects of not hauling substrate off-site. 2) As it addresses Alternative II - On-site Disposal, this discussion is provided solely for information regarding this option, as a background prior to the development an Environmental Assessment to evaluate permanent on-site substrate disposition options.

Air Quality: Air quality could be impacted as a result of the proposed substrate excavation and removal in the following ways: 1) suspended particulate matter generated from substrate removal activities and vehicle traffic; and 2) emissions from soil moving and hauling machinery and vehicles transporting equipment.

The proposed action is not expected to cause significant impact to the air quality of the project area or the region. The air emissions expected to result from the proposed activities are significantly less than the emission thresholds which trigger PSD or Non-attainment Area new source review.

Any increase in vehicular generated suspended particulates and emissions would be temporary, occurring during December to May of each year for the duration of the project. Natural air dispersion of the pollutants generated by the project, air circulation patterns characteristic of the area, and the low frequency of occurrence of air stagnation or inversions in the project area minimizes the potential for developing concentrations in excess of any applicable standards. Due to the temporary seasonal nature of the project and the comparative low annual emissions, the ENP PSD Class I area would not be significantly affected.

With approximately four trucks per working hour, the estimated project vehicle miles per day for the first year is 40, and the total estimated vehicle miles per year is 5,040. During the second, and subsequent years, eight trucks are proposed per working hour for a total of an estimated 80 miles per day, and a total 10,080 vehicle miles per year. This compares to the off-site disposal alternative which would have approximately 13 trucks per working hour, 1820 miles per day, and 229,320 miles per year for the first year. During the second, and subsequent years, 26 trucks would be in use per working hour for a total of 3640 miles per day, and 458,640 miles per year.

The vehicle miles and associated total yearly vehicle traffic emissions for on-site disposal would be approximately one-fourth of the yearly vehicle traffic emissions estimate reported for the Shell Western E & P Inc., Miccosukee 3-1 Exploratory Well Project, on the Miccosukee Indian Reservation, in Broward County, Florida. The Final Environmental Impact Statement (1994) for the exploratory well project concluded that no significant impacts to air quality were expected. With this in mind the proposed on-site soil disposal for the Hole-in-the-Donut is not expected to cause significant impact to the air quality of the project area.

To assure that air emissions related to the proposed action are kept to a minimum, the burning of cleared and piled vegetation would be conducted in accordance with the park's approved Fire Management Plan which includes appropriate state and county notifications and approvals. Roads and other appropriate areas would be watered as needed to minimize release of dust and suspended particles from vehicle traffic.

Cultural Resources: As noted in Appendix I, the State Historic Preservation Officer (SHPO) did not respond to the Corps' public notice. However, during the entire assessment process the potential for impacts to archeological or historic properties has

not been raised as an issue and the Corps is of the opinion that there would be none.

By letter dated 27 March 1996 the NPS Southeast Archeological Center concurred with the Corps determination that the project as originally proposed poses no threat to archeological resources. Everglades National Park is of the opinion that the proposed project modifications for on-site disposal also pose no threat to archeological resources.

As discussed above borrow pits are not proposed for use as disposal sites during the first 5 years of the project and as indicated the use of borrow pits as disposal sites will be assessed within the next 1-2 years. The use of the borrow pit at Missile Site HM-69 will require a determination of the old missile base's eligibility for the National Register. The eligibility of the missile base is uncertain; further research will be required to make a determination.

Water Quality:

Potential water quality impacts to surface water are associated with increases of sediment in runoff from soil excavation, removal, temporary stockpiling, and mound creating activities. The impacts would consist of localized and temporary increases in turbidity in waters adjacent to the excavation areas and the mounds under construction. The proposed on-site soil disposal for the Hole-in-the-Donut is not expected to cause significant impact to the water quality of the project area. The State Department of Environmental Protection has certified water quality for this project (see Appendix I).

As indicated in Appendix II (state permit) best management practices for the control of turbidity and erosion would be implemented during all work on site. Details regarding these control measures are discussed in Appendix II. To minimize sediment in runoff from the mounds, once completed the disposal mounds would be stabilized initially by planting non-invasive ground cover. More elaborate revegetation plans would follow.

Vegetation and Wetlands: Over the first 3-1/2 to 4 years of the 20 year project the proposed action would remediate approximately 7% of the Hole-in-the-Donut and place approximately 724,000 cubic yards of excavated soil into one mound on former wetlands within the Hole-in-the-Donut (see Appendix II for plan details). The mound would cover approximately 25 acres and be a maximum of 20

feet high with side slopes at 3:1. As discussed above the final construction of this mound and the additional mounds, as a method of on-site disposal for the remainder of the Donut, will be further assessed in the next 1-2 years.

It is estimated that 5 to 12 mounds, covering a total of approximately 150-200 acres of former wetlands, would be required to provide on-site disposal of all of the excavated material from the Donut. Initially with the construction of one mound, this represents occupying less than 1% of the 6250 acre project area. With 5 to 12 mounds this represents approximately 2-3% of the project area. The natural wetland function of these acres would not be restored.

However, the proposed action would restore approximately 25 acres of upland hardwood forest habitat (a total of approximately 150-200 acres if all 5 to 12 mounds are constructed) by developing upland forest sites using the excavated disturbed substrate and placing it in mounds. Originally the Hole-in-the-Donut contained approximately 100-150 acres of hardwood forest habitat. By placing the excavated soil in mounds spaced across the project area, the park would be attempting to restore some elements of this former habitat. The park proposes that some variation in habitats would enhance the overall restoration of the project area by increasing ecological diversity of the site, replacing similar types of vegetation covers that existed in the area prior to farming, and increase the diversity of wildlife using the site.

One obvious difficulty associated with the mounds is the fact that *Schinus* would easily invade these disturbed sites. The disposal mounds would be stabilized initially by planting non-invasive ground cover and maintained exotic free by periodic mowing. More elaborate contouring and revegetation plans, including those that would potentially benefit wildlife, would be developed and evaluated in the future. These would be done prior to completion of the individual mounds and in consultation with the Florida Game and Fresh Water Fish Commission, and the US Fish and Wildlife Service. After final construction, interest from the perpetual trust fund that will be in place to manage and monitor the entire Donut restoration project, could easily afford to provide intensive management and maintenance as required for these relatively modest upland platforms. The upland sites would be monitored for success in terms of erosion control and revegetation. The proposed on-site soil disposal for the Hole-in-the-Donut is not expected to cause significant impact to the vegetation and wetlands of the project area.

Wildlife: Significant impacts to general wildlife values are not anticipated as a result of the proposed action. The Donut project area does not support significant or sensitive populations of wildlife. The proposed action would result in the loss of 25 acres of potential wetlands and associated wetland wildlife values. There would be a temporary disruption of wildlife during the substrate excavation, removal, and mound construction. However, a more diverse variety of wildlife is expected to inhabit the restored area as approximately 900 acres are restored to functioning wetlands and 25 acres are developed into upland hardwood forest. Earth moving activities and vehicle traffic may result in avoidance of the area by some species, but this is not considered significant. The proposed activity is not expected to jeopardize the continued existence of federally listed threatened or endangered species or affect their critical habitat.

The preferred action to dispose of the Donut excavated material on-site in mounds within the Donut project area greatly reduces the Hole-in-the-Donut project conflicts with and disturbances to wildlife. Without the additional truck traffic of the off-site alternative going through major wildlife areas (e.g. Long Pine Key) additional wildlife mortality would be nearly if not completely eliminated.

While some potential for collision related mortality still exists with the on-site disposal alternative (since trucks would be hauling within the Donut area itself) the park believes this would be of minimal impact since the distances are so short (approximately 1 mile for any given mound) and since the areas primarily frequented by wildlife are those communities surrounding the Donut (particularly pinelands) and generally not the Donut itself. In order to minimize impacts to wildlife, including the Florida panther, daytime speeds for construction vehicles would be restricted to 35 mph and nighttime construction vehicle traffic would be prohibited.

Noise impacts on wildlife associated with the proposed action would occur from operation of earth moving machinery and equipment, vehicle traffic, and associated human activities. Information on the nature and effects of noise exposure to wildlife is sparse and often contradictory. In general, constant low level background noise seems to be less disrupting than loud and variable noises. Noise sources during soil excavation and removal include heavy equipment such as bulldozers, graders, front end loaders, and large hauling trucks. This type of equipment usually creates sound levels in the 70 to 90 dBA range at a distance of 50 feet. Such levels are generally audible

within one mile. Wildlife impacts attributable to noise generated during earth moving activities appears to be highly variable, as reported in the literature. It is likely that the behavioral and metabolic responses of general wildlife in the project area will be temporary, localized, and limited to the immediate work area associated with a mound under construction up to perhaps a mile from the activity center.

The construction and development of the mounds as upland forest sites may provide cover and forage for deer and other wildlife including the Florida panther. Plans for the contouring and revegetation of the mounds would be done prior to completion of the individual mounds and in consultation with the Florida Game and Fresh Water Fish Commission, and the US Fish and Wildlife Service. The proposed on-site soil disposal for the Hole-in-the-Donut is not expected to cause significant impact to the wildlife of the project area.

Visitor Experience and Visual Conditions:

The use of permanent disposal mounds as depicted in Figure 1 would virtually eliminate the potential conflict between truck traffic and visitor use. Trucks would no longer need to make use of public roads thereby reducing if not eliminating public safety concerns, adverse impacts on visitor experience, potential conflicts with park employee traffic, and potentially extensive and costly wear and tear on park road beds.

The potential for accidents with visitors is potentially high with an off-site disposal alternative. The newly renovated Main Visitor Center, the park entrance station, and the Royal Palm Visitor Center are all within the travel path of the truck hauling operations associated with an off-site disposal alternative. These are three of the most heavily visited sites in the park and continuous heavy truck traffic associated with off-site disposal would pose increased risk of vehicular accidents. Any critical visitor accidents might significantly affect the project continuation, at least temporarily. The proposed on-site disposal alternative nearly eliminates these concerns.

In the on-site disposal alternative, the area to be remediated over the first 3-1/2 to 4 years and the location of the first mound to be constructed is in the extreme western portion of the project area. The center of this activity area is approximately 3 miles from the Long Pine Key Campground and Picnic Area, and approximately 5 miles from the Hidden Lake Environmental

Education Center. It is estimated that soil excavation and disposal operations in this activity area would neither be visible nor audible from these visitor facilities. It is possible that during dry periods dust plumes from the soil removal and hauling operations may be visible to park visitors. However, view-sheds between park facilities and the initial remediation area are obstructed by significant amounts of vegetation such that visible dust plumes would probably occur infrequently. Watering of activity areas during dry periods would minimize any potential visual impact of truck-created dust plumes.

Noise impacts on visitors from actions associated with the proposed on-site disposal alternative would occur from operation of earth moving machinery and equipment, vehicle traffic, and associated human activities. Noise sources during soil excavation and removal include heavy equipment such as bulldozers, graders, front end loaders, and large hauling trucks. This type of equipment usually creates sound levels in the 70 to 90 dBA range at a distance of 50 feet. Such levels are generally audible only within one mile.

The preservation of natural quiet in Everglades National Park is an important consideration. The perimeter of the initial remediation area is approximately 2 miles from the Long Pine Key Campground and Picnic Area. The peak visitor season and use of this facility coincides with the months during which on-site soil removal and hauling would occur.

Although not closed to the public, the primitive fire road to the north of the initial remediation area and the paved road adjacent to the east are used almost exclusively by park employees, volunteers, and cooperators as there are no visitor facilities accessible from these roads. Visitors on bicycles occasionally use these roads as does the rare hiker. Visitor access to the wilderness of Long Pine Key is essentially limited to these and other primitive fire roads because of the difficulties of traveling cross country over pinnacle rock and through dense vegetation. Neither of these roads associated with the first 3-1/2 to 4 years of soil removal are used as primary access to the wilderness of Long Pine Key.

Any impacts to visitor experience and wilderness values, including those from noise, are expected to be localized and temporary. To minimize impacts to visitors, especially those using the Long Pine Key Campground, nighttime work would be prohibited. During implementation of the on-site disposal alternative, visitor complaints would be monitored and evaluated.

Necessary corrective measures would be taken as appropriate (e.g. not working on weekends, adjusting daily starting and ending times, etc.).

The visual nature of the initial proposed soil disposal mound, as well as the remaining mounds to be considered and assessed in the next 1 to 2 years, is also a consideration. A 25 acre mound of soil 20 feet high is an unusual landscape feature not found naturally in the Everglades. However, visual impacts would be minimized by re-contouring and planting the mounds (at least around the perimeter) with native plants, which are expected to within a few years look, from a short distance, to be no different than any other hammock or forested area in the park. It is anticipated that once the vegetation is mature, visually these mounds would completely blend into their surroundings.

The long-term effect of the proposed action would be to enhance visitor experience and wilderness values by the restoration of natural vistas and wetland function through the removal of a significant exotic landscape feature. The proposed on-site soil disposal for the Hole-in-the-Donut is not expected to cause significant impact to visual conditions, the visitor's park experience, or appreciation of wilderness values.

Park Facilities:

The proposed action of on-site soil disposal will nearly if not completely eliminate all Hole-in-the-Donut project conflicts and potential damage to park roads and infrastructure compared to an off-site disposal alternative. Potential impacts to park roads from increased heavy truck traffic hauling soil off-site is considered a serious complication to the project, and a potential cost to the park and project that would render the project insolvent were it required to fund even a portion of the major road repairs (see Appendix III for actual real dollar cost savings associated with on-site disposal).

In addition, the restoration of the C-111 basin requires that a large portion of the Main Park Road across Taylor Slough be rebuilt and bridged to allow greater water flow. This construction will begin within the next 12 months and may create significant delays for the Hole-in-the-Donut soil hauling process if disposal is off-site, and may seriously increase costs as the truck drivers are paid by the hour.

Most importantly, as mentioned above, an off-site soil disposal alternative would render the existing park road unusable and in

need of complete rebuilding somewhere between 2 and 4 years into the project. The park has determined that off-site disposal is no longer considered a viable alternative. The proposed on-site disposal alternative is not expected to cause significant impact to park facilities.

RELATIONSHIP AND CONSISTENCY OF THE PROPOSED ACTION (PREFERRED ALTERNATIVE) WITH LEGISLATION, POLICIES, GUIDELINES, AND OTHER PLANNING EFFORTS:

This section summarizes the obligations, objectives, places, and directive statements of government agencies and government commissioned groups, which are relevant and appropriate to the National Park Service's consideration of the HID restoration project and COE Permit 199301691 (see Appendix I). This is not an exhaustive summary and is intended to serve merely as an overview of the more important and pertinent documents.

FEDERAL STATUTORY REQUIREMENTS AND PRESIDENTIAL DIRECTIVES:

National Park Service Organic Act (16 USC 1 et seq.)

The Organic Act provides for the core authority for the mission of the National Park Service:

....which purpose is to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same.....

Everglades National Park Act (16 USC 410 et seq.)

In 1934 Congress established Everglades National Park and provided that the park:

....shall be permanently reserved as a wilderness, and no development or the project or plan... will interfere with the preservation intact of the unique flora and fauna and the essential primitive natural conditions now prevailing in this area. 16 USC 410c.

Everglades Expansion Act (16 USC 410r-5 et seq.)

In 1989 Congress authorized the expansion of Everglades National Park for the following purposes:

To increase the level of protection of the outstanding natural values of Everglades National Park and to enhance and restore the

ecological values, natural hydrological conditions, 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 part of their ecosystem. 16 USC 410r-7(b).

Endangered Species Act of 1973

Section 7 of the Endangered Species Act directs all federal agencies to use their authorities to conserve the endangered or threatened species. The NPS consults with the US Fish and Wildlife Service to ensure that any action authorized, funded or carried out by the NPS does not jeopardize the continued existence of listed species or critical habitat.

Wilderness Act (16 USC 1131 et seq.)

Most of the park is designated wilderness (92 Stat. 3490). The Act requires the NPS to administer wilderness areas so as to leave them unimpaired...and to preserve their wilderness character. The HID has been designated as potential wilderness. After restoration the area will become eligible for Wilderness designation.

Public Law 90-583

This law directs federal agencies to control exotic plants and:
...to provide for the control of noxious plants on lands under the control or jurisdiction of the Federal Government.

Executive Order 11987, Exotic Organisms (May 24, 1977)

This order established the responsibility to develop policy to control invasive exotics. The National Park Service Policy (NPS-77 and the NPS Management Objectives of 1988), and the Everglades National Park General Management Plan provide that:

...exotic plants and animals shall be controlled when necessary to prevent disruption to native communities....

Executive Order 11988, Floodplain Management; and Executive Order 11990, Protection of Wetlands

These orders direct federal agencies to enhance floodplain and wetland values and to avoid adverse impacts associated with modification of floodplains or wetlands.

Protecting America's Wetlands (White House Office on
Environmental Policy, August 24, 1993)

In "Protecting America's Wetlands" the Clinton Administration committed to an interim "no net loss" of wetlands goal and a long-term goal of increasing both the quality and the quantity of the nations's wetlands. The National Park Service, in an August 1994 memorandum from the Director, indicated that the NPS would continue policies currently in place that would restore wetlands or compensate acre-for-acre any wetland degradation or loss.

USDI, NPS GUIDELINES AND POLICIES:

U.S. Department of the Interior, National Park Service:
Management Policies, December, 1988

This document is the basic Service-wide policy document of the National Park Service and sets out the framework for management of the Parks therein.

Chapter 4 outlines the Natural Resource Management Policies and provides for:

....management of natural systems as established and approved in the statement for management or general management plan...

...the National Park Service will strive to restore native species in parks wherever...adequate habitat to support the species exists and can reasonably be restored in the park...

...will promote the conservation of endangered species...and conduct active management programs for their perpetuation...

...exotic plants will be managed and controlled that...interfere with natural processes and perpetuation of natural features or native species...high priority will be given to the management of exotic species that have a substantial impact on park resources and that can reasonably be expected to be successfully controlled...

...authorized Potential Wilderness lands will become designated wilderness upon the Secretary's determination that they meet the qualifications for Wilderness designation...and the National Park will manage areas of potential wilderness as wilderness...and seek to eliminate the conditions that preclude Wilderness designation...

Everglades National Park Statement for Management 1991

The concept of preserving, restoring, and protecting the resource of the park appear throughout each objective in the park's statement for management. The objectives for the park's natural ecosystems include the preservation of natural ecosystems to allow natural processes to continue and the restoration of damaged ecosystems. Specifically, the park must maintain natural environmental conditions in order to preserve and perpetuate natural biological diversity and composition. The park must also rehabilitate natural resources that have been subjected to adverse use, and finally, states that the wilderness character of the resource will be maintained and, when necessary and appropriate, restored.

Everglades National Park Management Plan

Is a basic guiding management document specific to Everglades National Park, and conforms to USDI, NPS Management Policies. The plan provides for:

...the management and control of exotic species that threaten Park resources...

National Park Service's Strategic Plan for Managing Invasive Nonnative Plants on National Park Service Lands

In concert with other agencies of the Department of Interior and the USDA National Forest Service, the National Park Service Developed a complementary Strategic Plan for Managing Invasive Nonnative Plants (NIPS) The plan describes the scope and resource impacts of NIPS and outlines strategies and tactics to help prevent and control the spread of NIPS on NPS lands.

National Parks for the 21st Century: The Vail Agenda Report and Recommendations to the Director of the National Park Service

The Vail Agenda Report resulted from the National Park Service's 75th Anniversary Symposium held in Vail Colorado, October 1991. The report recommends how to improve park system stewardship and NPS management and reaffirms the basic mission established in the Organic Act.

The report also recognizes that "the resources and values that constitute [a] park unit's contributions to the national park system should stand at the center of the parks policy". The report goes on to recommend that, "Natural resource in the park system should be managed under ecological principles that prevent

their impairment".

Department of the Interior Order Number 3190 "Departmental Responsibilities for Weed Control", June 22, 1995

The Order established the responsibility of each bureau and office to develop a coordinated weed prevention and management strategy. The strategies will include: weed prevention and early detection; education and awareness plan; baseline data on weed distribution; integrated approach to weed detection, prevention and management, coordinated across jurisdictional boundaries, and participation in a comprehensive, research, monitoring and evaluation program to assist prevention and management efforts.

The order provides that policies shall:

...manage populations of exotic plants and animals up to and including eradication...wherever such species threaten park resources... and high priority will be given to management of exotic species that have a substantial impact on park resources and that can be reasonably expected to be successfully controlled.

SOUTH FLORIDA ECOSYSTEM RESTORATION DIRECTIVES AND GUIDANCE:

South Florida Ecosystem Restoration Task Force: Interagency Working Group, 1994 Report

In 1993, the United State Departments of the Interior, Commerce, Army, Justice, and Agriculture, and the Environmental Protection Agency, entered into an interagency agreement on south Florida ecosystem restoration. The agreement established the South Florida Ecosystem Restoration Task Force to oversee the coordination and implementation of south Florida ecosystem restoration efforts. In 1995, the Task Force further included as members, the Lieutenant Governor of Florida, the Chairman of the Seminole Indian Tribe of Florida, and the Chairman of the Miccosukee Tribe of Indians of Florida.

The report discusses several objectives, including:

...prevention of further wetland loss.....restoration and recovery of degraded, undeveloped wetlands.....control and

management of invasive exotic plants.

Governor's Commission for a Sustainable South Florida, Commission Report August 1996

Concomitant with the establishment of the South Florida Ecosystem Restoration Task Force, the Office of the Governor established the Governor's Commission for a Sustainable South Florida.

The Commission Report discusses several objectives, including:

Improvement of habitat quality and heterogeneity.....provide the spatial extent of natural areas required to support the mosaic habitat characteristic of the pre-drained Everglades ecosystem.....provide for sustainable populations of native plants and animals with special attention to threatened, endangered or species of special concern.....restore, and where appropriate, improve functional quality of natural systems (including both wetlands and uplands).....reduce the spatial extent of invasive nonnative species that are threatening (and perhaps dominating) areas as a result of disturbances.....extensive use of herbicides (for control of exotics) is contrary to water quality improvement, alternative methods need further investigation..... restore soil formation processes.....

CONSISTENCY DISCUSSION:

As the preferred alternative fully supports the purpose of the project; and allows the park, through temporary stockpiling substrate within the HID, nearly or completely eliminates the serious concerns regarding visitor and park infrastructure impacts; and nearly or completely eliminates coincidental wildlife deaths due to truck traffic on roads, it is considered to be entirely consistent with the legislated park purposes, policies and guidelines. This alternative is also in keeping with objectives and recommendations of the South Florida Ecosystem Task Force and Governor's Commission for a sustainable south Florida with regard to prevention of wetland loss, restoration and recovery of degraded wetlands, control and management of invasive exotic plants, restoring and where appropriate, improving functional quality of natural systems (including both wetlands and uplands). For the same reasons this alternative is in keeping with Departmental Policies regarding the management and control of invasive species, especially where success is reasonably expected. This alternative is also consistent with the White House Office on Environmental Policy "Protecting America's Wetlands" as no-net-loss of wetlands would

occur, and both the quality and quantity of wetlands within the Park would be significantly improved and increased. In addition, this alternative is in keeping with the Wilderness Act since after restoration these recreated wetlands would become eligible for Wilderness designation and protection. This alternative also is entirely consistent with the Endangered Species Act, as it provides for a restoration of habitats (consistent with the original habitat components) that will benefit endangered species. This alternative is considered full implementation of the existing project proposal and permit(s) (removal of all substrate from the Park) and has been implemented in order to provide the Park sufficient time to conduct an environmental assessment to develop a more appropriate disposal alternative for the entire project, and prevent serious impacts to Park values.

While Alternative I (removal of all substrate from the Park) also appears consistent with restoration of wetlands and management and control of invasive exotics, it is much less consistent with the overall concerns regarding visitor and park infrastructure impacts and liabilities. And when compared with the preferred alternative (stockpile substrate within the HID site) it also increases the risk of incidental wildlife deaths due to increased road use of heavy equipment.

SUMMARY OF COMPLIANCE AND IMPLEMENTATION REQUIREMENTS:

Clean Air Act, as amended: 42 U.S.C. 7401 et seq. The National Park Service (NPS) has applied for all required permits and will conform with all requirements of the Act related to any emissions produced by the Hole-in-the-Donut project. All vehicles and construction-related equipment will conform to Florida emissions standards. All permits and permit modifications will be obtained prior to the start of project work.

Clean Water Act (Federal Water Pollution Control Act), as amended: 33 U.S.C. 1251 et seq. (PL 92-500). The NPS has applied for a U.S. Department of the Army permit and a State of Florida Department of Environmental Protection (DEP) permit to perform the work as originally proposed (off-site soil disposal). All permits and permit modifications will be obtained prior to the start of project work. Florida State Department of Environmental Protection issued the water quality certification on 14 February 1995. DEP issued a permit for the work as originally proposed on 15 February 1995. Modifications to the DEP permit to provide for complete on-site disposal of excavated material were approved 15 August 1996.

Coastal Zone Management Act of 1972, as amended: 16 U.S.C. 1451 et seq. The NPS has applied for all State permits to perform work in the coastal zone. All permits and permit modifications will be obtained prior to the start of project work. Issuance of the DEP permit certifies that the project is consistent with the Coastal Zone Management plan.

Endangered Species Act (ESA) of 1973, as amended: 16 U.S.C. 1451 et seq: This project was fully coordinated under the ESA through the Corps' Regulatory process. By letter dated 9 November 1993, the U.S. Fish and Wildlife Service (FWS) the FWS concurred with the Corps determination that the proposed project may effect the Florida panther and initiated consultation under Section 7 of the ESA. By letter dated 15 February 1994, the FWS advised that with specific measures incorporated in the Department of the Army permit, if issued, the proposed project (as originally proposed with off-site disposal) would be unlikely to adversely effect the Florida panther. These specific measures were incorporated into the DEP permit and have been modified as appropriate in the modified DEP permit addressing on-site disposal.

Pursuant to the US Fish and Wildlife Service (FWS) letter of 15 February 1994, the FWS will be notified and consultation will be re-initiated as appropriate in light of the proposed project modifications to provide for complete on-site disposal of excavated material.

Fish and Wildlife Coordination Act, as amended: 16 U.S.C. 661 et seq. The work as originally proposed was coordinated with the FWS through the Corps' Regulatory process. As indicated above, the FWS will be notified and coordination will be re-initiated as appropriate in light of the proposed project modifications to provide for complete on-site disposal of excavated material.

National Environmental Policy Act of 1969, as amended: In accordance with the regulations of the Council on Environmental Quality (40 CFR 1508.5) the National Park Service (NPS) requested by letter dated 23 June 1994, that the Department of the Army permit the NPS to participate as a cooperating agency in the preparation of the Environmental Assessment (EA) and Statement of Finding (SOF) for permit application number 199301691 for mitigation in the "Hole-in-the-Donut" (HID) of Everglades National Park. The Department of the Army, Corps of Engineers (Corps), honored the park's request by letter dated 28 July 1994, citing the benefits of avoiding redundant compliance efforts.

After review of the above referenced Environmental Assessment and Statement of Findings, and further evaluation of the impacts of

the proposed project, the NPS has identified additional information necessary to fulfill NPS compliance responsibilities under the National Environmental Policy Act (NEPA). The scope and purpose of this supplemental environmental assessment is limited to the potential environmental consequences of substrate hauling and disposal alternatives.

Environmental information on the project has been compiled and the Environmental Assessment is available for public review. The process will fully comply with the Act once the Finding of No Significant Impact has been signed by the Corps' District Commander and the Superintendent of Everglades National Park.

National Historic Preservation Act of 1966, as amended: By letter dated 27 March 1996 the NPS Southeast Archeological Center concurred with the Corps determination that the project as originally proposed poses no threat to archeological resources. Everglades National Park is of the opinion that the proposed project modifications also pose no threat to archeological resources. Therefore, this project is in compliance with the National Historic Preservation Act and the Archeological and Historic Preservation Act.

Executive Orders 11988 and 11990, respectively, Flood Plain Management and Protection of Wetlands: The project complies with these E.O.s as the proposed action restores the natural and beneficial values of flood plains and wetlands.

The Water Resources Division of the NPS has reviewed the original proposal with respect to the need for Floodplain/Wetland Statements of Findings (SOFs) in accordance with the National Park Service Floodplain Management and Wetland Protection Guidelines (45 FR 35916; minor revisions in 47 FR 36718) and with Special Directive 93-4: Revised Guideline for Floodplain Compliance. Assuming that the environmental impacts of the alternatives for this project will be adequately addressed in an appropriate NEPA document, WRD has determined that the park need not prepare SOFs.

WRD's interpretation of the wetlands provisions of the NPS Floodplain Management and Wetland Protection Guidelines is that the restoration aspects of the proposed activity do not constitute "adverse effects" on wetlands (Section 5.A.1). Therefore, the procedures requiring a wetland Statement of Findings outlined in Section 6 would not be triggered. Furthermore, the restoration of approximately 6,250 acres of wetlands is consistent with Sections 3.G. and 6.C.5.b. of the guidelines, which direct the NPS to restore the natural functions

and values of wetlands which have been harmed by previous human activities.

The WRD will be notified and consultation will be re-initiated as appropriate in light of the proposed project modifications to provide for complete on-site disposal of excavated material.

CONSULTATION AND COORDINATION:

Two public notices have been issued by the Corps to date (see Appendix I). A third public notice will be issued, identifying the modifications to the project, and sent to all interested parties including appropriate State and Federal agencies.

APPENDIXES:

Appendix I: U.S. Department of the Army Environmental Assessment and Statement of Finding for Permit Application 199301691

Appendix II: Florida State Department of Environmental Protection permit package including modifications

Appendix III: Actual real dollar cost savings associated with on-site disposal

DECISION NOTICE
and
FINDING OF NO SIGNIFICANT IMPACT
for
RESTORATION OF WETLANDS IN THE HOLE-IN-THE-DONUT
EVERGLADES NATIONAL PARK

The National Park Service (NPS) has prepared supplemental environmental information to the Department of the Army's Environmental Assessment and Statement of Findings for mitigation in the "Hole-in-the-Donut" (HID) of Everglades National Park. This Supplemental Environmental Assessment describes a preferred alternative that implements the current Department of the Army Permit for the HID with temporary stockpiling of substrate on-site.

The preferred alternative will temporarily stockpile HID substrate on-site over the first 18-24 months of the project. The preferred alternative implements the existing Department of the Army Permit without modification. This alternative also allows sufficient time for the development and evaluation of alternatives for on-site disposal of HID substrate. The stockpiling of substrate is currently permitted in the Department of the Army Environmental Assessment and Statement of Findings for Permit No. 199301691.

During the construction of the temporary stockpile on-site, a supplemental Environmental Assessment (EA) will be prepared over the next 12-24 months, to identify and assess opportunities for on-site disposal of HID substrate. This supplemental EA would address on-site disposal options including; method(s), location(s), size(acres), height, configuration, sloping, and revegetation preferences. This supplemental EA will also address the use of borrow pits as disposal sites. The stockpile would be kept free of exotics.

This project was fully coordinated under the Endangered Species Act (ESA) through the Corps' Regulatory process. By letter dated 9 November 1993, the U.S. Fish and Wildlife Service (FWS) concurred with the Corps' determination that the proposed project may effect the Florida panther and initiated consultation under Section 7 of the ESA. By letter dated 15 February 1994, the FWS advised that with specific measures incorporated in the Department of the Army permit, if issued, the proposed project (as originally proposed with off-site disposal) would be unlikely to adversely effect the Florida panther. These specific measures were incorporated into the Florida State Department of Environmental Protection (DEP) permit and have been modified as appropriate in the modified DEP permit addressing on-site disposal.

Pursuant to the US Fish and Wildlife Service letter of 15 February 1994, the FWS will be notified and consultation will be reinitiated as appropriate in light of the proposed project modifications and further environmental assessment to provide for complete on-site disposal of excavated material.

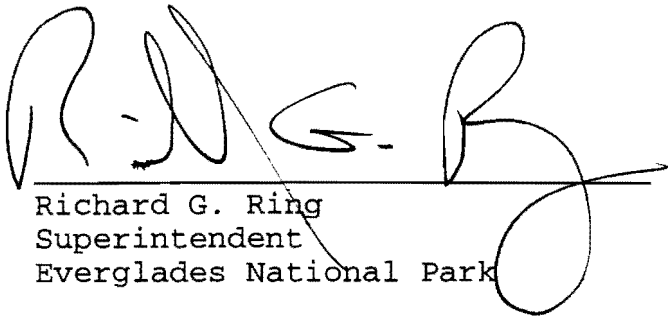
By letter dated 27 March 1996, the NPS Southeast Archeological Center concurred with the Corps' determination that the project as originally proposed poses no threat to archeological resources. Everglades National Park will conduct additional cultural resources compliance as appropriate during consideration and assessment of complete on-site disposal of excavated material.

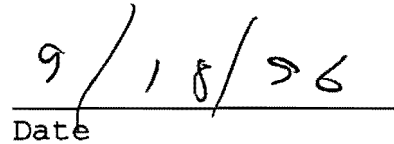
The Water Resources Division (WRD) of the NPS has reviewed the original proposal with respect to the need for Floodplain/Wetland Statements of Findings (SOFs) in accordance with the National Park Service Floodplain Management and Wetland Protection Guidelines (45 FR 35916; minor revisions in 47 FR 36718) and with Special Directive 93-4: Revised Guideline for Floodplain Compliance. Concerns have been raised over the potential impacts associated with the permanent disposal of HID substrate. As indicated above, the environmental impacts of the permanent disposal alternatives for this project will be addressed in an environmental assessment to be prepared over the next 12 to 24 months. The WRD has determined that the park need not prepare SOFs for the preferred alternative involving temporary stockpiling on-site within the HID. The Water Resources Division of the NPS will be notified and consultation will be reinitiated as a necessary part of the evaluation of permanent HID substrate disposal alternatives.

WRD's interpretation of the wetlands provisions of the NPS Floodplain Management and Wetland Protection Guidelines is that the restoration aspects of the proposed activity do not constitute "adverse effects" on wetlands (Section 5.A.1). Therefore, the procedures requiring a wetland Statement of Findings outlined in Section 6 would not be triggered. Furthermore, the restoration of approximately 6,250 acres of wetlands is consistent with Sections 3.G. and 6.C.5.b. of the guidelines, which direct the NPS to restore the natural functions and values of wetlands which have been harmed by previous human activities.

I have reviewed: (1) the Department of the Army Environmental Assessment and the Statement of Finding for permit application number 199301691 for mitigation in the "Hole-in-the-Donut" of Everglades National Park, (2) the Department of the Army Permit instrument for the HID, and (3) the Supplemental Environmental Assessment prepared by park staff to provide additional

information necessary to fulfill NPS compliance responsibilities. Having reviewed these documents I find that proceeding with the actions in the Department of the Army's Permit, but utilizing only the temporary on-site stockpiling alternative as described in the park's supplemental document, will not have a significant impact on the quality of the human environment and an Environmental Impact Statement will not be required.


Richard G. Ring
Superintendent
Everglades National Park


Date

APPENDIX I

CESAJ-CO-RS-J
199301691(IP-OC)

March 12, 1996

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

1. Applicant: Everglades National Park
Post Office Box 279
Homestead, Florida 33030

2. Location, Project Description, Existing Conditions:

a. Location: The project is located in the **Hole-in-the-Doughnut**, west of the Royal Palm Ranger Station in the Everglades National Park, Dade County, Florida, in:

Section(s):	21,28,33-36	15-21	7,18,30,31	6,7
Township:	58 South	58 South	57 South	58 South
Range:	36 East	37 East	38 East	38 East

Latitude 25°22'30''N., Longitude 80°41'30''W. (Approximate center of property).

b. Existing Site Conditions: The Hole-in-the-Doughnut (HID) is ±10,000 acres which was intensively farmed for several decades using only crude mechanical soil preparation methods. In the early 1950's rock plowing was developed and this provided a much better crop substrate than the earlier methods had. Approximately 6,300 acres of the HID were rock-plowed and farmed. This pedogenesis changed the area from primarily low nutrient, low oxygen (perhaps anaerobic in some circumstances) conditions to higher nutrient, higher oxygen conditions which have been linked to increased susceptibility to exotic invasion. Since the Everglades National Park (ENP) acquired the property and active farming ceased in 1975, the rock-plowed area has become dominated by a virtual monoculture of Brazilian pepper (*Schinus*

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

terebinthifolius). The manipulation of the substrate effectively raised the elevation of the area and dramatically altered the natural hydrology so that the entire area is severely degraded.

c. Project Description: The proposed project is to:

(1) Excavate and temporarily stockpile on-site
±10 million cubic yards from ±6,250 acres; and

(2) Place ±240,000 cubic yards of permanent fill over
±10 acres, all in jurisdictional wetlands in the HID to construct
from stockpiled material, 3 overlook mounds, each approximately
25 feet high and with parking space for ±30 automobiles.

The proposed project would have a duration of 20 years.

[NOTE: Temporary roads to facilitate the excavation and removal
of material are required and the areas impacted by them will be
restored to the original condition when they are no longer
needed].

d. Changes to the Project: As originally proposed,
approximately 560,000 cubic yards of fill would have been placed
over 23.5 acres to construct 7 overlook mounds. This was reduced
to 4 as a conservation recommendation resulting from Endangered
Species Act Section 7 Consultation with the FWS for the Florida
panther. The ENP then deleted another one so that there are only
3. These 3 remaining mounds will be accessed from existing roads
and will be limited to areas already open for use by people and
vehicles.

3. Overall Project Purpose: The purpose of the proposed project
is to enhance a poorly functional wetland system and then convert
the area for use to offset impacts within the Mitigation Service
Area consisting of those portions of the Bird Drive Basin and
North Trail Wetlands Basin identified in the April 27, 1993

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for the Above-Numbered Permit Application

Memorandum of Understanding between the Department of Environmental Protection and Dade County DERM.

4. Statutory Authority: Section 404 of the Clean Water Act (33 U.S.C. 1344).

5. Other Federal, State, and Local Authorizations Obtained or Required and Pending:

a. State Permit/Certification: Florida State Department of Environmental Protection (DEP) issued the water quality certification on 14 February 1995.

b. Coastal Zone Management (CZM) Consistency/Permit: Issuance of the DEP permit certifies that the project is consistent with the CZM plan.

6. Date of Public Notice and Summary of Comments:

a. The application was received on 16 September 1993. The application was considered complete on 7 October 1993. A public notice was issued on 15 October 1993, and sent to all interested parties including appropriate State and Federal agencies. [NOTE: A second public notice was issued on 22 February 1994 notifying recipients that the duration of the permit, if issued, would be 20 years]. All comments received on either or both public notices for this application have been reviewed and are summarized below:

(1) Environmental Protection Agency (EPA): The EPA did not respond to the public notice.

(2) U.S. Fish and Wildlife Service (FWS):

(a) By letter dated 9 November 1993, the FWS concurred with the Corps determination that the proposed project may effect the Florida panther and initiated consultation under Section 7 of

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for the Above-Numbered Permit Application

the Endangered Species Act. (The suspense date became 23 March 1994).

(b) By letter dated 15 February 1994, the FWS advised that with the following recommendations and specific measures incorporated in the Department of the Army permit, if issued, the proposed project would be unlikely to adversely effect the Florida panther:

i. The speed limit for all contractors trucks and equipment in the project area, including truckers hauling material from the site, shall be 35 m.p.h. This will be posted on all roadways, and contractors informed that this regulation will be strictly enforced by National Park Service Rangers.

ii. All work on the project involving movement of trucks and heavy equipment at the work site(s) or roads will be done during daylight hours only.

iii. Only the overlook mounds numbered 1, 5, and 7 on the project plans will be constructed.

iv. An experimental draft plan to revegetate former wetland pineland shall be developed by the ENP and presented within 18 months from the date of this permit instrument. The plan shall contain 3-5 experimental plots of about 10 acres each. The Department of the Army will coordinate this experimental plan with the Fish and Wildlife Service and approve it for implementation by the National Park Service.

(3) National Marine Fisheries Service (NMFS): By letter dated 8 June 1993, NMFS indicated that any adverse effects on resources for which they were responsible would be minimal and that they, therefore, did not object to issuance of the permit.

(4) State Historic Preservation Officer (SHPO): The SHPO did not respond to the public notice. However, during the

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for the Above-Numbered Permit Application

entire process the potential for impacts to archeological or historic properties has not been raised as an issue and the Corps is of the opinion that there will be none.

(5) Other:

(a) South Florida Regional Planning Council (SFRPC): By letter dated 9 November 1993, the SFRPC recommended that a thorough mitigation implementation and monitoring program be required and provided several of their goals and policy statements. By letter dated 2 March 1994, the SFRPC provided additional comments, questioned the need for and purpose of the 7 overlook mounds, and reiterated several of their policy and goal statements.

(b) Individuals and Firms: By letter dated 28 October 1993, Arvida praised the proposed project as being the kind of effort which would help both developers and the environment in the area.

b. Applicant's response to the comments: The applicant was apprised of the Corps and other comments by letter dated 25 February 1994. The applicant responded by letter dated 11 March 1994, generally as follows:

(1) The ENP fully intends to post and regulate all contractors trucks and equipment to a maximum speed of 35 mph. However, based on earlier consultation with the FWS about the Florida panther, the speed limit for automobiles was reduced from 55 mph to 45 mph in 1986. The ENP proposes to leave the automotive speed limit at 45 with appropriate areas posted at 35 for them. The ENP indicated that FWS (Mr. Joe Carroll) had agreed to this during discussions. However, the State DEP permit specific conditions further restricted the speed to 35 miles per hour.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for the Above-Numbered Permit Application

(2) The ENP agrees that contract work involving the movement of trucks or heavy equipment on the work site(s) or on roads will take place only during daylight hours.

(3) The ENP agrees to delete the 3 overlook mounds specified by the FWS and, additionally, will also delete mound number 6.

(4) ENP agrees in principle with the idea of experimentation but needs clarification of the FWS proposal. They agree that the department of the Army will coordinate for other resource agency review and input to their plan but want to be certain that the primary responsibility for the conduct of the experiment remains with them.

7. Alternatives:

a. Avoidance: The purpose of the proposed project is to restore the HID to its former wetlands status. The only impacts are the excavation, the permanent overlook mounds, and the temporary placement of excavated material on-site for the temporary roads and the balance for subsequent removal to proximal upland areas. As evidenced by the test site, at project completion the HID would be restored to its pre-rock plowing wetlands status. Avoidance is not an issue.

b. Minimization (modified project designs, etc.): With the deletion of 4 of the originally planned 7 overlook mounds and the plan to remove and restore any areas disturbed by temporary roads, the impacts have been minimized to the maximum extent practicable and still meet the proposed project purpose.

c. Compensatory Mitigation (Wetland enhancement, creations, etc): This project will restore historical everglades wetlands that will be used as compensation for development projects in Dade county. Thus, no mitigation was offered or considered for the temporary impacts that will be incurred during construction.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

8. Section 404(b)(1) Guidelines Evaluation:

a. Factual Determinations (230.11):

(1) Physical substrate (230.11(a)):

(a) Extent of substrate changes: The Brazilian pepper and other exotics/vegetation will be removed from the site and the surface recontoured to reestablish the wetlands regime which existed before farming and rock plowing took place. The substrate will be permanently modified (i.e., restored) and the hydroperiod will be increased. As demonstrated in the prototype tests, this is the most effective method of encouraging the re-establishment of indigenous vegetation. This is indeed the substance of the proposed project.

(2) Aquatic Ecosystem Effects (230.11(e)):

(a) Structure of ecosystem: The ecosystem in the HID has been dramatically altered by farming. However, once the area is restored the ecosystem is expected to improve and return to many of its' original functions and values.

(b) Ecosystem functions: The ecosystem functions have been altered by man made variety of topographical features caused by rock plowing. However, once the area is restored the ecosystem is expected to improve and return to many of its' original functions and values.

(c) Wildlife: There will be a disruption of wildlife use during the construction period. However, a more diverse variety of wildlife is expected to inhabit the restored area.

(3) Cumulative Effects (230.11(g)):

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

(a) Anticipated similar projects in area/watershed: The proposed restoration of the HID is unique in the area and the watershed.

(b) Anticipated future consequences: The anticipated future consequences should be dramatic and beneficial. The successful application of the test site methods to the restoration of several thousand acres will answer any questions of scale. This will help determine appropriate remedial action on areas outside of the immediate vicinity where other abandoned rock plowed or otherwise severely disturbed properties offer such opportunities.

(4) Secondary effects:

(a) Leaching: One of the functions provided by muck is the ability to sequester pollutants as surface water leaches through it. Lowering the substrate elevation will also lengthen the hydroperiod and provide better opportunity for this sequestration to occur.

(b) Surface runoff: The hydrology of the area has been dramatically altered by man made changes in topography. The effect of this is to decrease runoff over that which prevailed locally. The proposed project will restore the historic hydrology.

b. Restrictions on Discharges:

(1) Alternatives:

(a) The activity is located in a special aquatic site.

(b) The activity needs to be located in a special aquatic site to fulfill its basic purpose.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

(c) It has been demonstrated in paragraph 7 above that there are no practicable nor less damaging alternatives which would satisfy the project's overall purpose.

(2) Other program requirements:

(a) The proposed activity will not violate applicable State water quality standards or Section 307 prohibitions or effluent standards.

— (b) The proposed activity will not jeopardize the continued existence of federally listed threatened or endangered species or affect their critical habitat.

(c) The proposed activity will not violate the requirements of a federally designated marine sanctuary.

(3) The activity will not cause nor contribute to significant degradation of waters of the United States., including adverse affects on human health; life stages of aquatic organisms; ecosystem diversity, productivity and stability; and recreational, esthetic, and economic values.

(4) Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

b. Findings: The proposed site for the discharge of dredged or fill Material complies with the Section 404(b)(1) Guidelines with the inclusion of the following conditions;

1. The permittee agrees to implement the general procedures outlined in the project specifications developed in accordance with the document entitled " Restoration of Former Wetlands within the Hole-In-The-Donut Everglades National Park: Project Plan and Specifications" (enclosed as part of this permit instrument). Any changes to these methods and procedures must be

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

coordinated with the U.S. Army Corps of Engineers, Regulatory
Branch (USACE) as a request for permit modification.

2. The permittee agrees to restore, at a minimum, the number of acres for which payment has been committed as per the specifications of the Memorandum of Understanding (MOU) between the ENP, the National Park Foundation and Metropolitan Dade County, Department of Environmental Resources Management, enclosed as part of this permit instrument. The wetland restoration shall be available to offset wetland losses incurred by projects within the Mitigation Service Area (MSA), which are those portions of the Bird Drive and North Trail Wetland basins identified in the Memorandum of Understanding between the Florida Department of Environmental Protection (DEP) and Metropolitan Dade County Department of Environmental Resources Management. Compensation for projects outside of the MSA will require a modification of this DA permit.

3. The permittee agrees that pursuant to the MOU, mitigation for wetland impacts within the MSA will consist of a dollar amount per acre of impact being contributed to the Dade County Freshwater Wetlands mitigation Trust Fund (FWMT Fund). Dade County DERM shall transmit funds received into this account to the National Park Foundation which will manage the funds allocated for restoration efforts within the Hole in the Donut authorized by this permit and the long-term monitoring and maintenance of this restoration in accordance with the MOU. One mitigation credit shall be assigned for each acre of wetlands to be restored. A maximum of 6,250 credits shall be available. Restoration activities cannot occur until such time that sufficient funds have been collected for construction and long-term maintenance/management of each phase of the project to be constructed. Therefore, mitigation credits for this project are available up-front, prior to initiation of any construction.

4. Temporary haul roads may be constructed through disturbed wetland areas to allow construction vehicles access to

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and Statement of Finding for the Above-Numbered Permit Application

the mitigation areas. The permittee agrees that these temporary haul roads shall be completely removed and their footprints restored to match the adjacent topography and vegetation upon completion of work in a specific area of the site.

5. The permittee agrees that existing pineland areas within the project site which have not been rock plowed and are covered by native vegetation shall not be disturbed.

6. Excavated material may be stockpiled on-site pending removal to the approved disposal sites or placed on-site for construction of the three overlook mounds in accordance with the designs and in the locations indicated within the permit drawings.

7. Off-site disposal of the excavated materials shall occur in upland areas within the Frog Pond as indicated on sheet 3 of the permit drawings. The proposed locations of the specific spoil sites must be submitted to the USACE for review and approval prior to disposal.

8. In order to protect the Florida panther, the permittee agrees to restrict daytime speeds to 35 miles per hour for construction vehicles. Further, no nighttime construction vehicle traffic will be allowed.

9. The permittee shall provide the USACE, a copy of the annual report specified in the MOU verifying satisfactory completion of the work in accordance with the approved restoration plan. The report shall include a general description of the work performed to date, discussion of monitoring results and general observations, as well as a summary of expenditures to date. The report shall also include the following information: (a) numerical listing of DA permits contributing to the FWMT Fund; (b) wetland acres restored as result of the DA permits; and (c) the total acreage remaining for restoration as of the date of the transaction.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

10. Monitoring:

(a) Monitoring and success criteria shall be as established by the DEP permit number 132416479. The permittee shall submit annual monitoring reports to the USACE and shall reference the DA permit number indicating the status of the project.

(b) Depending on the results, the USACE may request the permittee to continue monitoring until the created system has been successfully established. The permittee recognizes that they have a continuing obligation to complete and correct any unsuccessful wetland creation or exotic vegetation removal/maintenance plan beyond the expiration date of the permit. Further utilization of compensatory mitigation credits may be suspended until the required monitoring report has been submitted and mitigation success agreed to by the USACE.

(c) If the data indicates that the mitigation effort is not successful, the permittee shall have a period of 120 days from the receipt of such notice within which to present methods and proposals to remedy such noncompliance for review and approval by the USACE to ensure success of the effort. In addition, the mitigation scheme will be reviewed every 5 years, and subject to modification if any of the success criteria are not resulting in the achievement of the established goals as described herein and in the MOU.

11. The permittee agrees to develop, coordinate with the USACE, and implement an experimental plan to revegetate former wetland pinelands in Grid Sections A and B and geographic sections 3 through 8 scheduled for work after the year 2000. The draft plan must be presented to the USACE within 18 months of permit issuance for review and approval. The USACE will coordinate the draft plan with other resource agencies for comments. The ENP is fully responsible for performing the work defined in the plan.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

9. Public Interest Review:

a. Corps analysis of comments and responses: The concerns raised by the FWS were resolved by inclusion of special conditions in the DA permit.

b. All public interest factors have been reviewed. The following public interest review factors are considered relevant to this proposal. Both cumulative and secondary impacts on the public interest were considered.

(1) Economics: This project will provide an effective mechanism of securing the funds required to restore the HID.

(2) Esthetics: Removal of the exotic intruders on the site, recontouring the surface, and encouraging the return of the native vegetation will bring the HID into concert with the surrounding terrain. The result will be a return to the original vista and an aesthetically attractive site.

(3) General Environmental Concerns: The proposed project addresses general environmental concerns by restoring preexisting conditions to a large area of the ENP. An exotic plant community, mainly Brazilian pepper, and seed source will be permanently removed from the area.

(4) Wetlands: The proposed project will restore the natural wetlands function of the property. This will also contribute positively to the much larger area effected by the surface runoff and by the resurgence of the native vegetation.

(5) Fish and Wildlife Values: These values on the existing site have been diminished by the Brazilian pepper and the manmade hydrological alterations. It is obvious that these will be improved by the proposed project.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

(6) Recreation: There is a small contribution to this from the overlook mounds but it is not a significant factor in the proposed project.

(7) Water Quality: The State DEP has certified water quality for this project.

(8) Safety: During implementation of the restoration program operating equipment will pose an increased safety concern. However, there is nothing inherent in the proposed project which will exacerbate this over that encountered in other projects.

(9) Considerations of Property Ownership: The project site is within the ENP and, therefore in public ownership. The proposed project represents a beneficial use of public lands.

c. Describe the relative extent of the public and private need for the proposed structure or work: Public benefits accrue from every aspect of the proposed project. The restoration of a large disturbed area of a national park and the continued awareness of such a program derived from the overlook mounds make this is a regionally important project.

d. Describe the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed work where there are unresolved conflicts as to resource use: There are no unresolved conflicts.

e. Describe the extent and permanence of the beneficial and/or detrimental effects which the proposed work is likely to have on the public and private uses to which the area is suited: No detrimental effects are expected to result. Restoration of these lands to historical everglades conditions is supported by the present administration. Further evidence of this is given by the many favorable letters and petitions which were received during the public interest review.

CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

f. Threatened or Endangered Species: As noted above, formal coordination with the FWS concluded with the DA permit being conditioned to restrict construction vehicle traffic to 35 miles per hour and no construction traffic during nighttime. The project as modified will not adversely affect the Florida panther.

g. Corps Wetland Policy: As modified, the benefits of the proposed project, even after considering the use as mitigation, compensate for the loss of the wetlands. It has further been shown that there is no viable alternative site. The proposed project, as revised, is the least environmentally damaging, practicable alternative and is otherwise in compliance with the Corps wetlands policy.

h. Cumulative and Secondary Impacts: A secondary impact will be the added attraction for further development of related businesses and support facilities such lodging, restaurants, and service industries. Cumulative impacts are a concern and the Corps will evaluate any future application in the area with this in mind. (This is also discussed in 8.a.(3), above).

10. Determinations:

a. Finding of No Significant Impact (FONSI): Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

b. Compliance with 404(b)(1) guidelines. Having completed the evaluation in paragraph 8 above, I have determined that the proposed discharge complies with the 404(b)(1) guidelines.

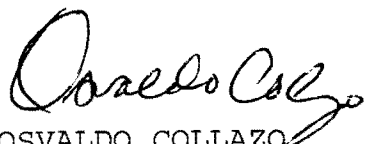
CESAJ-CO-RS-J 199301691(IP-OC)

SUBJECT: Department of the Army Environmental Assessment and
Statement of Finding for the Above-Numbered Permit Application

c. Public Interest Determination: I find that issuance of a Department of the Army permit is not contrary to the public interest.

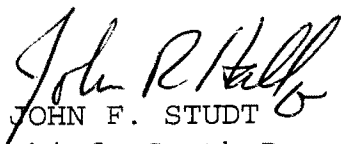
d. Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

PREPARED BY:



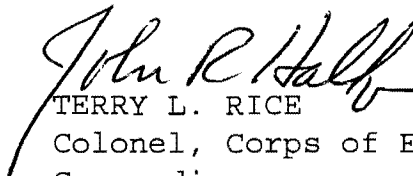
OSVALDO COLLAZO
Project Manager

REVIEWED BY:



JOHN F. STUDT
Chief, South Permits Section

APPROVED BY:



TERRY L. RICE
Colonel, Corps of Engineers
Commanding

CF:

CESAJ-CO-RS

CESAJ-CO-RS-M

DEPARTMENT OF THE ARMY PERMIT

Permittee: EVERGLADES NATIONAL PARK

Permit No. 199301691

Issuing Office: U.S. Army Engineer District, Jacksonville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Work includes excavating and stockpiling ± 10 million cubic yards of material in order to restore 6,250 acres of wetlands within the Hole-in-the-Donut. In addition, $\pm 240,000$ cubic yards of permanent fill will be placed over ± 10 acres to construct 3 overlook mounds, each approximately 25 feet high, with parking spaces for 30 automobiles. Temporary roads required to facilitate the excavation and removal of material will be restored to the original condition when no longer needed. The project is as shown and described in attached plans numbered 199301691(IP-OC) in 6 sheets, dated December 1992.

Project Location: The project is located in the **Hole-in-the-Doughnut**, west of the Royal Palm Ranger Station in the Everglades National Park, Dade County, Florida, in:

Section(s):	21,28,33-36	15-21	7,18,30,31	6,7
Township:	58 South	58 South	57 South	58 South
Range:	36 East	37 East	38 East	38 East

Latitude $25^{\circ}22'30''$ N., Longitude $80^{\circ}41'30''$ W. (Approximate center of property).

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 2 OF 7

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on _____. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit, you must obtain the signature and mailing address of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee agrees to implement the general procedures outlined in the project specifications developed in accordance with the document entitled " Restoration of Former Wetlands within the Hole-In-The-Donut Everglades National Park: Project Plan and Specifications" (enclosed

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 3 OF 7

as part of this permit instrument). Any changes to these methods and procedures must be coordinated with the U.S. Army Corps of Engineers, Regulatory Branch (USACE) as a request for permit modification.

2. The permittee agrees to restore, at a minimum, the number of acres for which payment has been committed as per the specifications of the 1993 Memorandum of Understanding (MOU) between the ENP, the National Park Foundation and Metropolitan Dade County, Department of Environmental Resources Management, enclosed as part of this permit instrument. The wetland restoration shall be available to offset wetland losses incurred by projects within the Mitigation Service Area (MSA), which are those portions of the Bird Drive and North Trail Wetland basins identified in the Memorandum of Understanding between the Florida Department of Environmental Protection (DEP) and Metropolitan Dade County Department of Environmental Resources Management. Compensation for projects outside of the MSA will require a modification of this DA permit.

3. The permittee agrees that pursuant to the MOU, mitigation for wetland impacts within the MSA will consist of a dollar amount per acre of impact being contributed to the Dade County Freshwater Wetlands mitigation Trust Fund (FWMT Fund). Dade County DERM shall transmit funds received into this account to the National Park Foundation which will manage the funds allocated for restoration efforts within the Hole in the Donut authorized by this permit and the long-term monitoring and maintenance of this restoration in accordance with the MOU. One mitigation credit shall be assigned for each acre of wetlands to be restored. A maximum of 6,250 credits shall be available. Restoration activities cannot occur until sufficient funds have been collected for construction and long-term maintenance/management of each phase of the restoration project. Therefore, mitigation credits for this project are available up-front, prior to initiation of any authorized construction.

4. Temporary haul roads may be constructed through disturbed wetland areas to allow construction vehicles access to the mitigation areas. The permittee agrees that these temporary haul roads shall be completely removed and their footprints restored to match the adjacent topography and vegetation upon completion of work in a specific area of the site.

5. The permittee agrees that existing pineland areas within the project site which have not been rock plowed and are covered by native vegetation shall not be disturbed.

6. Excavated material may be stockpiled on-site pending removal to the approved disposal sites or placed on-site for construction of the three overlook mounds in accordance with the designs and in the locations indicated within the permit drawings.

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 4 OF 7

7. Off-site disposal of the excavated materials shall occur in upland areas within the Frog Pond as indicated on sheet 3 of the permit drawings. The proposed locations of the specific spoil sites must be submitted to the USACE for review and approval prior to disposal.

8. In order to protect the Florida panther, the permittee agrees to restrict daytime speeds to 35 miles per hour for construction vehicles. Further, no nighttime construction vehicle traffic will be allowed.

9. The permittee shall provide the USACE, a copy of the annual report specified in the MOU verifying satisfactory completion of the work in accordance with the approved restoration plan. The report shall include a general description of the work performed to date, discussion of monitoring results and general observations, as well as a summary of expenditures to date. The report shall also include the following information: (a) numerical listing of DA permits contributing to the FWMT Fund; (b) wetland acres restored as result of the DA permits; and (c) the total acreage remaining for restoration as of the date of the transaction.

10. Monitoring:

a. Monitoring and success criteria shall be as established by the DEP permit number 132416479. The permittee shall submit annual monitoring reports to the USACE and shall reference the DA permit number indicating the status of the project.

b. Depending on the results, the USACE may request the permittee to continue monitoring until the created system has been successfully established. The permittee recognizes that they have a continuing obligation to complete and correct any unsuccessful wetland creation or exotic vegetation removal/maintenance plan beyond the expiration date of the permit. Further utilization of compensatory mitigation credits may be suspended until the required monitoring report has been submitted and mitigation success agreed to by the USACE.

c. If the data indicates that the mitigation effort is not successful, the permittee shall have a period of 120 days from the receipt of such notice within which to present methods and proposals to remedy such noncompliance for review and approval by the USACE to ensure success of the effort. In addition, the mitigation scheme will be reviewed every 5 years, and subject to modification if any of the success criteria are not resulting in the achievement of the established goals as described herein and in the MOU.

11. The permittee agrees to develop, coordinate with the USACE, and implement an experimental plan to revegetate former wetland pinelands in

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 5 OF 7

Grid Sections A and B and geographic sections 3 through 8 scheduled for work after the year 2000. The draft plan must be presented to the USACE within 18 months of permit issuance for review and approval. The USACE will coordinate the draft plan with other resource agencies for comments. The ENP is fully responsible for performing the work defined in the plan.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

() Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 6 OF 7

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

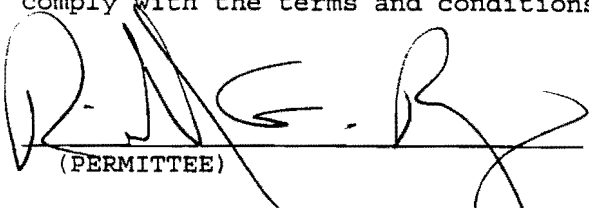
c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

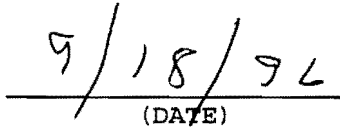
Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

PERMIT NUMBER: 199301691
PERMITTEE: EVERGLADES NATIONAL PARK
PAGE 7 OF 7

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.


(PERMITTEE)


(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(FOR THE DISTRICT ENGINEER)
TERRY L. RICE
DISTRICT ENGINEER

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEEEE-SIGNATURE)

(DATE)

(NAME-PRINTED)

(ADDRESS)

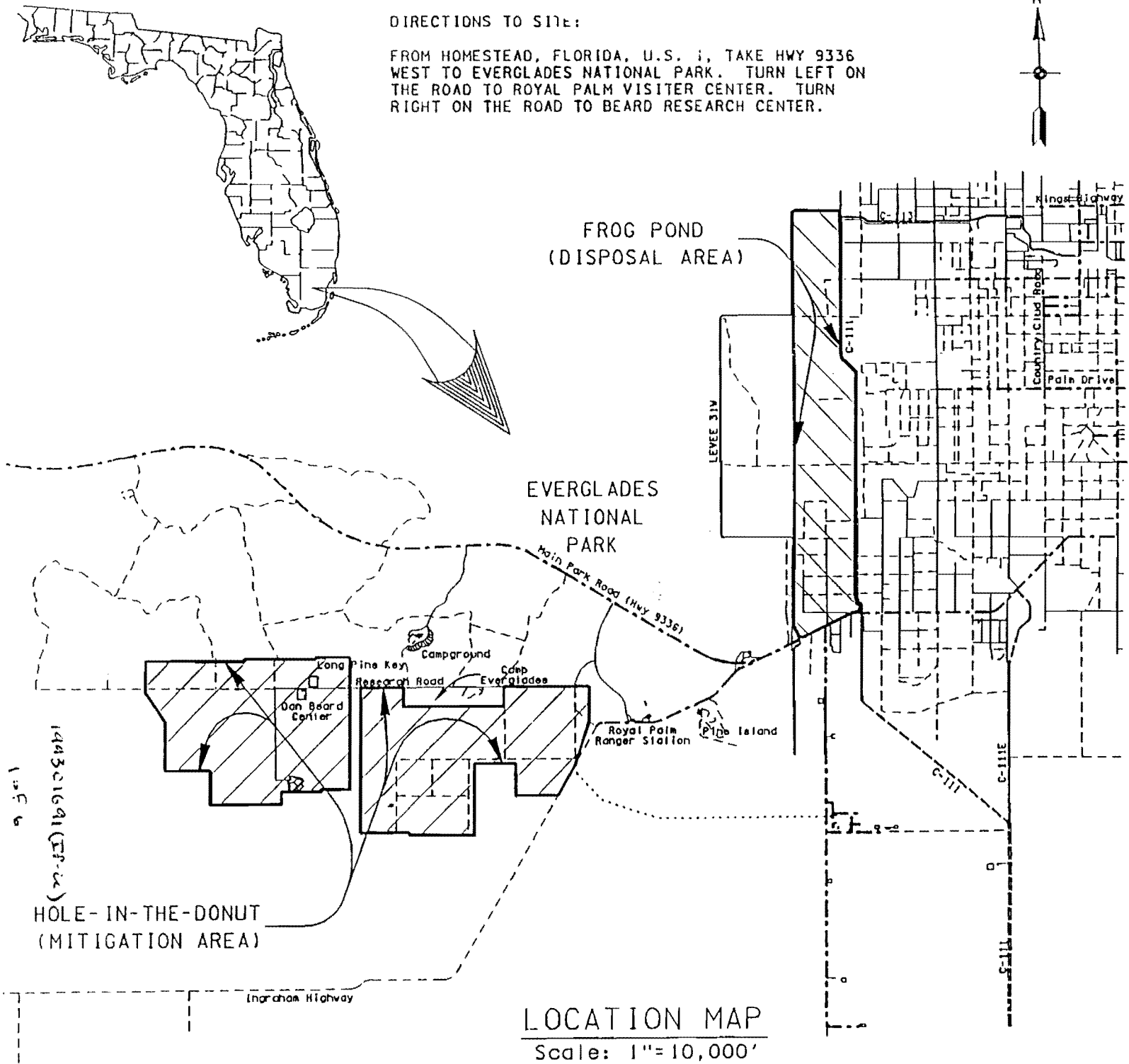
(CITY, STATE, AND ZIP CODE)

PERMIT NO. 132416429



DIRECTIONS TO SITE:

FROM HOMESTEAD, FLORIDA, U.S. 1, TAKE HWY 9336 WEST TO EVERGLADES NATIONAL PARK. TURN LEFT ON THE ROAD TO ROYAL PALM VISITOR CENTER. TURN RIGHT ON THE ROAD TO BEARD RESEARCH CENTER.



LOCATION MAP

Scale: 1"=10,000'

APPLICANT: Everglades National Park
WATER BODY: N/A
COUNTY: Dade
DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
ORIGINAL WORK ☒ MAINTENANCE ☐
SHEET NO.: 1 OF 6
DATE: December 1992

[A]
[B]
[C]
[D]

SEASAJ-EN-UL (O.L.N.)





DISPOSAL AREA
(APPROX. 3083 Ac.)

PERMIT NO. 132416478

FROG POND

PROXIMAL AGRICULTURAL AREAS

Howry Drive

Richard Road

Country Club Road

Palm Drive

Pumping Sta

DISPOSAL AREA PLAN

Scale: 1"=4,000'

199301091 (EP-00) S.F.C.

APPLICANT: Everglades National Park

WATER BODY: N/A

COUNTY: Dade

DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands

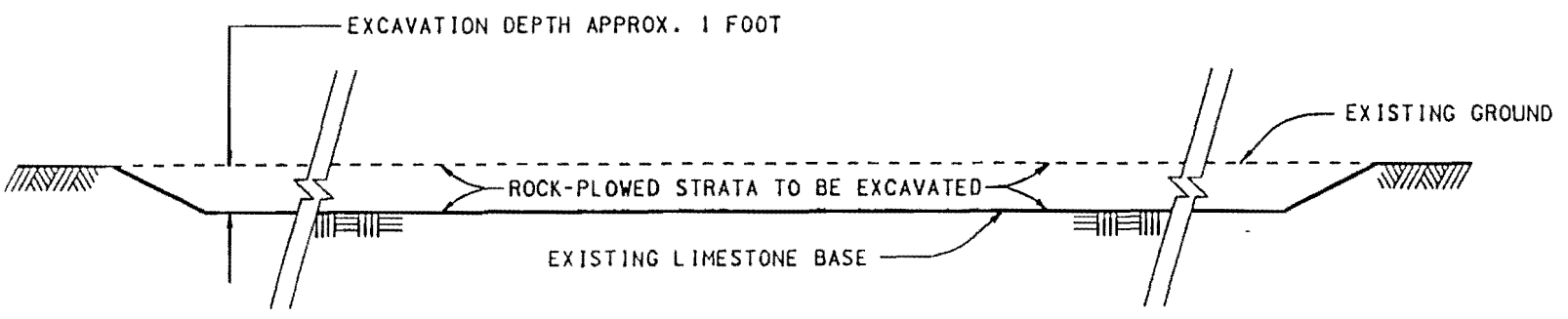
ORIGINAL WORK ☒ MAINTENANCE ☐

SHEET NO.: 3 OF 6 SEP

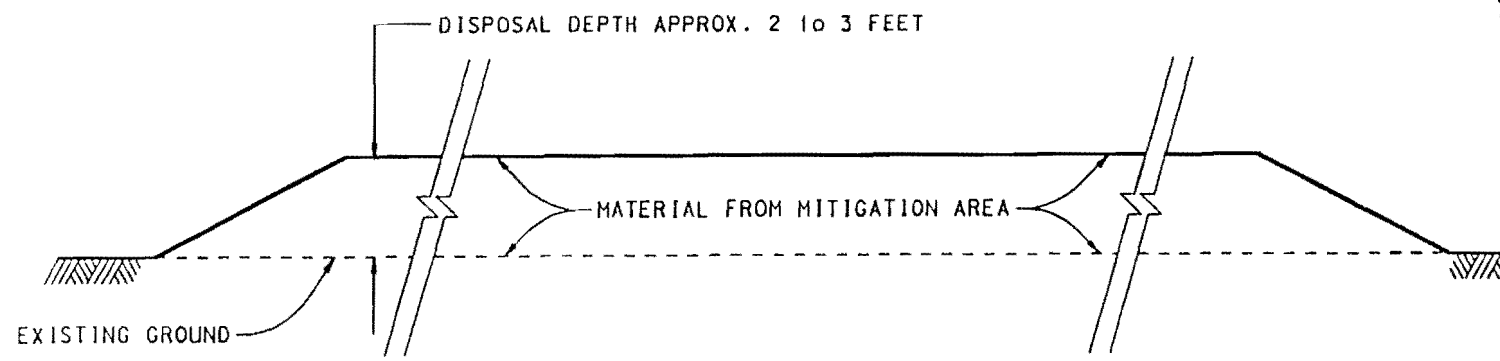
DATE: December 1992

CESAJ-EN-DL (D.L.N.)

PERMIT NO. 132416479



TYPICAL CROSS SECTION, MITIGATION AREA



TYPICAL CROSS SECTION, DISPOSAL AREA

TYPICAL CROSS SECTIONS

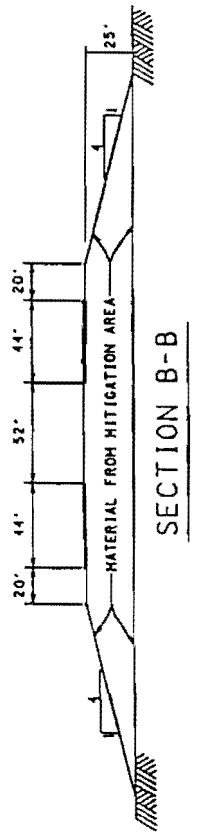
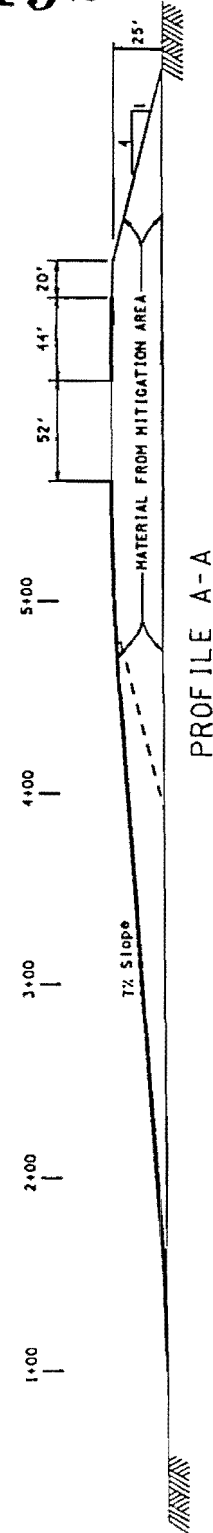
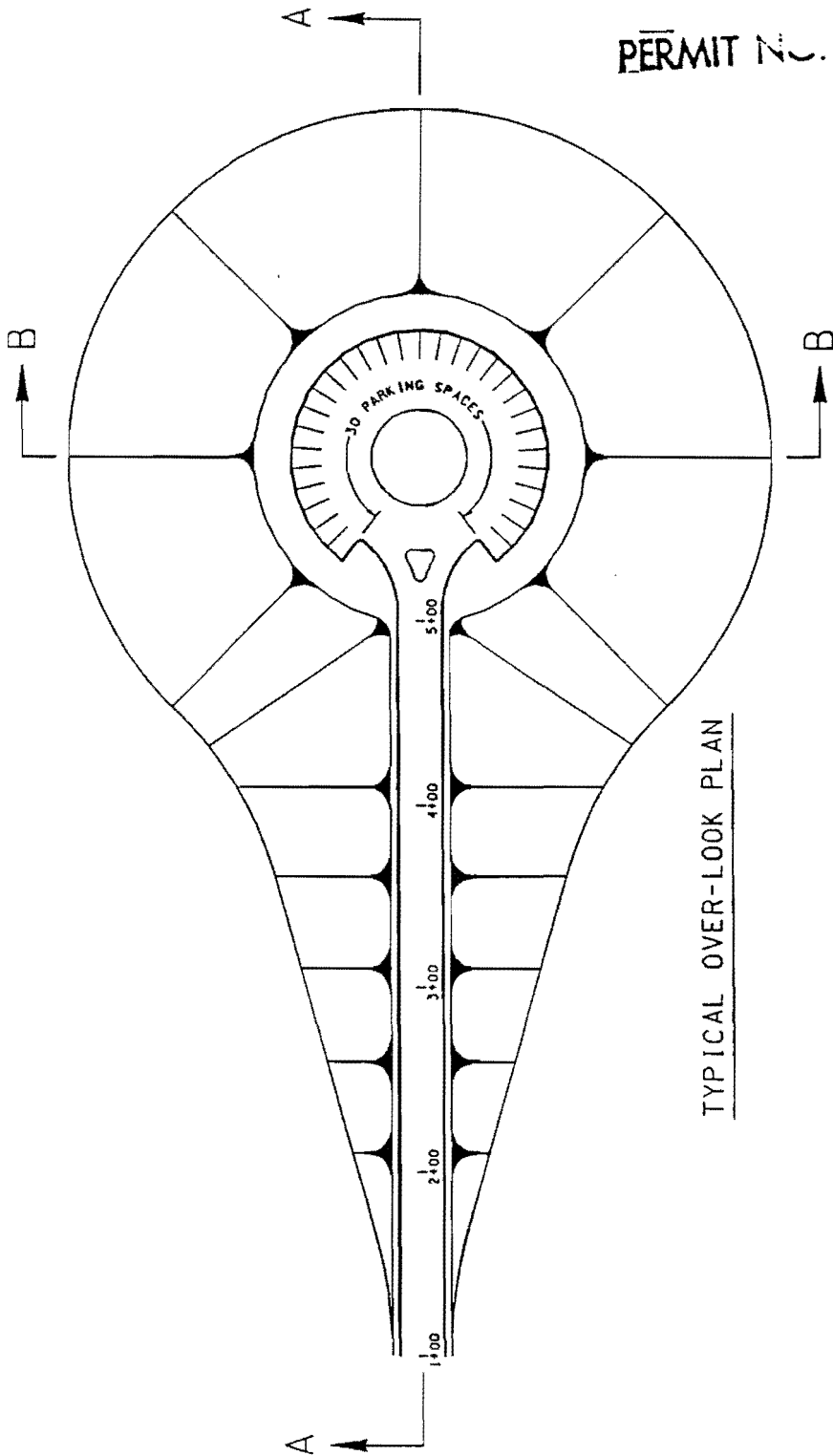
Not To Scale

APPLICANT: Everglades National Park
WATER BODY: N/A
COUNTY: Dade
DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
ORIGINAL WORK ☒ MAINTENANCE ☐
SHEET NO.: 4 OF 6
DATE: December 1992

1993-01-11 (Cred) Jofe
RECEIVED
REST. RES. BUREAU
JAN 11 1993

PERMIT NO. 132415479



OVER-LOOK PLAN,
PROFILE AND X-SECTION

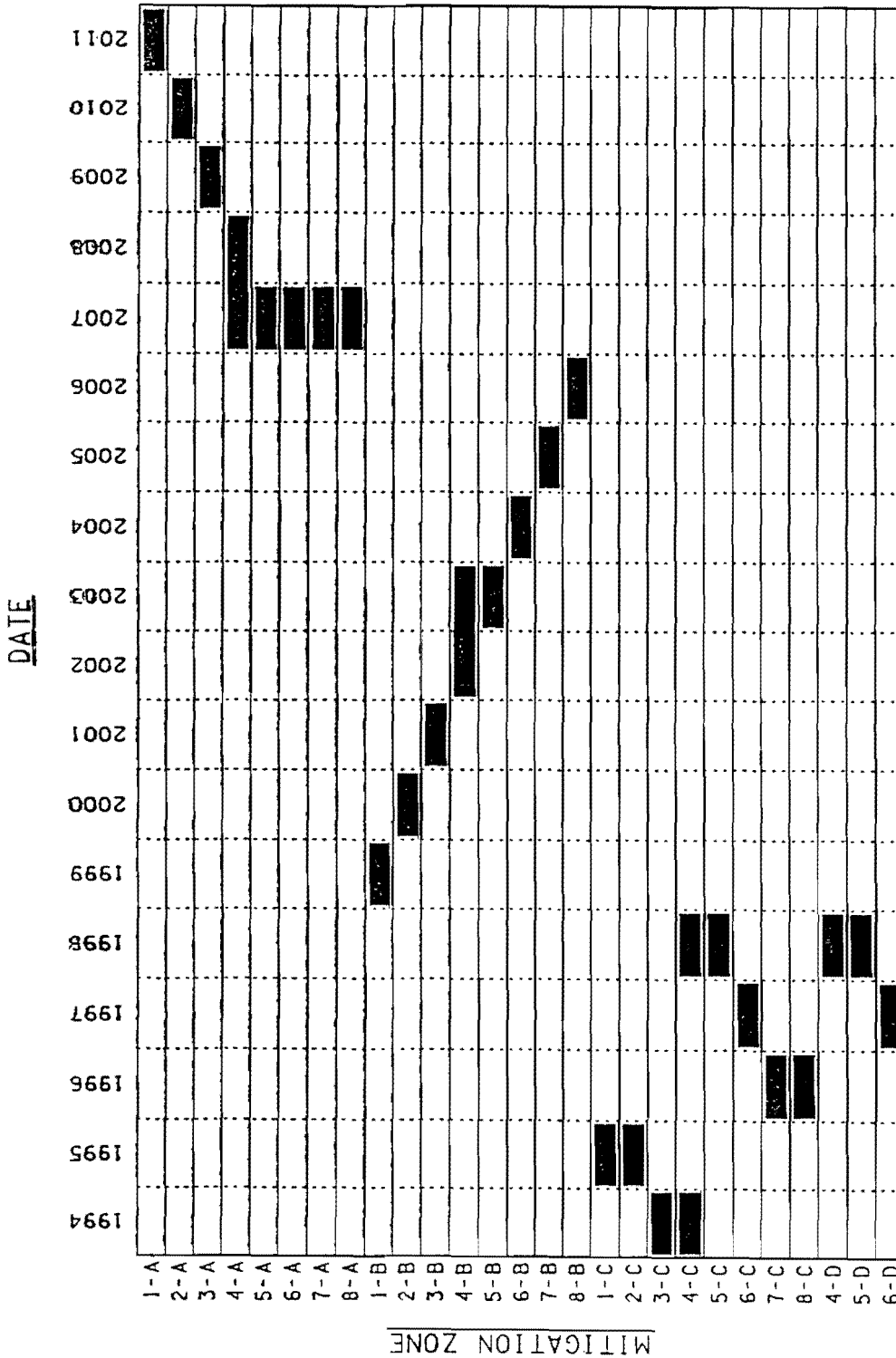
SCALE: 1"=100'

APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 5 OF 6
 DATE: December 1992

CESAJ-EN-OL (D.L.N.)

PERMIT NO. 132416479



MITIGATION PHASING DIAGRAM

NOTE:

FOR MITIGATION ZONES,
SEE SHEET NO. 2.

APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 6 OF 6
 DATE: December 1992

CESAJ-EN-DL (D.L.N.)

APPENDIX II

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

C E R T I F I E D

In the Matter of an
Application for Permit by:

Everglades National Park
c/o Mr. Robert Doren
Post Office Box 279
Homestead, Florida 33030

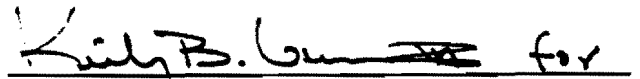
DEP File No. 132416479
Dade County

Enclosed is Permit Number 132416479, issued pursuant to Chapters 373 and 403, Florida Statutes.

Any party to the Order (Permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION


Virginia B. Wetherell, Secretary

Notice of Final Permit
Permit No. 132416479
Page 2

cc:

Larry O'Donnell, DEP, Southeast District
Florida Marine Patrol
U.S. Army Corps of Engineers, Jacksonville
Game and Fresh Water Fish Commission
Submerged Lands and Environmental Resources Permit File
Leigh O'Shields, DEP, State Lands
Dade County Property Appraiser
Silvia Morell Alderman

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed to the listed persons before the close of business on this 15th day of February, 1995.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Camela H. Randolph 2/15/95
Clerk Date



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:

Everglades National Park
c/o Mr. Robert Doren
Post Office Box 279
Homestead, Florida 33030

Permit Number 132416479

Date of Issue: 02/15/95

Expiration Date: 02/15/2020

County: Dade

Project: Wetland Resource
Mitigation Bank, 20 years

This permit is issued under the provisions of Chapters 373 and 403, Florida Statutes, Public Law 92-500, Title 17, and Rule 17-312, Florida Administrative Code. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

PROJECT DESCRIPTION:

To restore approximately 6,250 ac. of wetlands within the Hole in the Donut area of Everglades National Park by removing exotic vegetation and excavating to limestone base; creating 3 upland mounded overlooks from former wetlands, totaling 10 ac., using excavated material; and disposing the remaining excavated material on uplands within the Frog pond, or other areas within the C-111 basin in coordination with U.S. Army Corps of Engineers. This restoration project will be managed as a mitigation bank for wetland impacts associated with projects within the Bird Drive and North Trails Basins.

PROJECT LOCATION:

The project site is located within the Hole In The Donut area of Everglades National Park, Dade County

Section:	21,28,33-36	15-21	7,18,30,31	6,7
Township:	58 South	58 South	57 South	58 South
Range:	36 East	37 East	38 East	38 East

within the landward extent of Everglades, Everglades National Park, Class III waters.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings,

Permittee: Everglades National Park
Permit No: 132416479
Page 2

exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

- (a) Have access to and copy any records that must be kept under conditions of the permit;
- (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- (c) Sample or monitor any substances or parameters at any location reasonable necessary to assure compliance with this permit or Department rules.

Permittee: Everglades National Park
Permit No: 132416479
Page 3

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

- a. A description of and cause of noncompliance; and
- b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Section 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 17-302.500, shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.

11. This permit is transferable only upon Department approval in accordance with Rule 17-4.120 and 17-730.300 F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500).

Permittee: Everglades National Park
Permit No: 132416479
Page 4

14. The permittee shall comply with the following:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
- b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
 1. the date, exact place, and time of sampling or measurements;
 2. the person responsible for performing the sampling or measurements;
 3. the dates analyses were performed;
 4. the person responsible for performing the analyses;
 5. the analytical techniques or methods used; and
 6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The permittee is hereby advised that Florida law states: "No person shall commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund or the Department of Environmental Protection under Chapter 253, until such person has received from the Board of Trustees of the Internal Improvement Trust Fund the

Permittee: Everglades National Park
Permit No: 132416479
Page 5

required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 16Q-14, if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.

2. If historical or archaeological artifacts, such as Indian canoes, are discovered at any time within the project site the permittee shall immediately notify the district office and the Bureau of Historic Preservation, Division of Historical Resources, R. A. Gray Building, 500 S. Bronough St., Tallahassee, Florida 32399-0250.

3. At least 48 hours prior to commencement of work authorized by this permit, the permittee shall notify the Department of Environmental Protection, Bureau of Submerged Lands and Environmental Resources in Tallahassee, and the Southeast District office in West Palm Beach, in writing of this commencement.

4. This permit authorizes the creation of a mitigation bank composed of the restoration of a maximum of 6,250 acres of wetlands within the Hole-in-the-Donut section of Everglades National Park. The Park shall implement the general procedures and methods as outlined in the project specifications developed in accordance with the document entitled "Restoration of Former Wetlands within the Hole-in-the-Donut Everglades National Park: Project Plan and Specifications" (Exhibit B, Attachment I to this permit). The procedures and methods shall be further refined through the Park's contracting process in awarding the project contract. The specifications developed as part of the contracting process shall be submitted to the Bureau of Submerged Lands and Environmental Resources as minor modification requests for review, approval, and incorporation into this permit. As the "adaptive management" process (described in specific condition 23) continues to be applied to the mitigation project, and specifications are further refined, these refinements shall also become incorporated into the permit through minor modification requests.

5. The Park shall restore, at a minimum, the number of acres for which payment has been committed as per the specifications of the Memorandum of Understanding (MOU) between Everglades National Park, the National Park Foundation and Metropolitan Dade County, Department of Environmental Resources Management (DERM) (Attachment I).

6. Construction of the work authorized by this permit shall be phased as indicated on Sheet 6 of the permit drawings. Mobilization for construction of any particular phase of the restoration project shall commence only upon receipt of funds,

Permittee: Everglades National Park
Permit No: 132416479
Page 6

pursuant to the specifications of the tri-party MOU, sufficient to fulfill all construction and long-term management/maintenance needs for the total acreage of wetland restoration to occur within that phase.

7. Best management practices for the control of turbidity and erosion shall be implemented during all work on site. Prior to the start of work, turbidity control measures shall be in place in order to control erosion and turbidity during construction. The erosion and turbidity control measures shall be checked and maintained on a daily basis until work has been completed and all side slopes have been stabilized, and turbidity values within the turbidity and erosion control measures are at or below ambient background levels. If the turbidity barriers in place are not sufficient to adequately control erosion and turbidity, work shall be halted immediately and supplemental measures shall be implemented prior to resumption of work.

8. Restoration shall be accomplished by removing the existing exotic vegetation and excavating the rocky material down to an undisturbed limestone base-rock (an estimated 1 ft. drop in elevation).

9. Temporary haul roads may be constructed through disturbed wetland areas to allow construction vehicles access to the mitigation areas. These temporary haul roads shall be completely removed and their footprints restored to match the adjacent topography and vegetation upon completion of work in a specific area of the site.

10. Existing vegetation shall be mechanically cleared and grubbed for either removal from the site or burning.

11. Existing pineland areas within the project site which have not been rock plowed and are covered by native vegetation shall not be disturbed.

12. Excavated materials may be temporarily stockpiled on-site pending removal to the approved disposal sites or placed on-site for construction of the three overlook mounds in accordance with the designs and in the locations indicated on Sheets 2 and 5 of the permit drawings.

13. The three mounded overlooks shall be constructed within Brazilian pepper infested former wetlands and shall be constructed of compacted fill. The parking areas at the top of the overlooks shall be constructed of a permeable surface that allows water to percolate into the underlying soil. The overlooks shall be maintained free of exotic vegetation. If the permittee desires, at some time in the future, to construct a paved access and parking area at any of the three overlooks, the permittee shall submit a modification request that includes designs of an appropriate stormwater treatment system.

Permittee: Everglades National Park
Permit No: 132416479
Page 7

14. Within 30 days of completion of substrate removal within each parcel, the permittee shall submit to the Bureau of Submerged Lands and Environmental Resources for approval, a map of the mitigation parcel depicting the proposed sampling locations, fixed photographic stations, and the mitigation wetland area.

15. Off-site disposal of the excavated materials shall occur in upland areas within the Frog Pond as indicated on Sheet 3 of the permit drawings, within the proximal agricultural areas east of the C-111 canal, or within other upland areas in coordination with the U.S. Army Corps of Engineers Central and South Florida Project within the C-111 Basin. The proposed locations of specific spoil sites must be submitted to the Bureau of Submerged Lands and Environmental Resources for review and approval prior to disposal.

16. In order to protect the Florida panther, daytime speeds for construction vehicles shall be restricted to 35 mph and nighttime construction vehicle traffic shall be prohibited.

17. Following implementation of each portion of the restoration project authorized by this permit, monitoring of the mitigation wetlands to assess the effects of the project, using the methods established in the attached document entitled "Restoration of Former Wetlands within the Hole in the Donut in Everglades National Park; Project Plans and Specifications" (Exhibit B of Attachment I), shall be performed until a determination of a successful mitigation is obtained for each portion of the mitigation project authorized by this permit.

18. The Park shall provide to the Bureau of Submerged Lands and Environmental Resources and the Department Southeast District Office in West Palm Beach a copy of the annual report specified in the MOU (Attachment I) verifying satisfactory completion of work in accordance with the approved restoration plan. These reports shall include a general description of the work performed to date, discussion of monitoring results and general observations, as well as a summary of expenditures to date. This annual report shall be submitted concurrent with the annual monitoring reports specified in Specific Condition No. 30.

19. The wetland restoration realized through the activities authorized in this permit shall comprise the Everglades National Park Hole in the Donut Mitigation Bank and shall be available to offset wetland losses proposed within the Mitigation Service Area specified in Specific Condition 20.

20. Mitigation credit from the ENP Hole in the Donut Mitigation Bank shall only be available for wetland impacts incurred by projects within those portions of the Bird Drive and North Trail Wetland Basins identified in the April 27, 1993 Memorandum of Understanding between the Department and Dade County DERM (Attachment II). Specifically, the Mitigation Service Area shall

Permittee: Everglades National Park
Permit No: 132416479
Page 8

include those portions of the Bird Drive and North Trail Basins located within the Year 2000 Urban Development Boundary Line as depicted on the 1988 Dade County Comprehensive Development Master Plan's Land Use Map.

Withdrawals from the mitigation bank for impacts associated with projects in other areas may be allowed on a case-by-case basis and must be addressed through a minor modification request submitted by the Park in accordance with Rule 62-312.100, F.A.C.

21. Pursuant to the April 27, 1993 MOU, mitigation for wetland impacts within the Mitigation Service Area identified in Specific Condition no. 20 will consist of a set dollar amount per acre of impact being contributed to the Dade County Freshwater Wetlands Mitigation Trust Fund (FWMT Fund). A percentage of these funds will be set aside for use by the Everglades National Park for the proposed Hole in the Donut restoration. The dollar amount established as mitigation for each acre of wetlands impacted within the Bird Drive and North Trail Basins shall be sufficient to permit construction and long-term maintenance of a corresponding acre of wetlands restored under this permit.

Dade County DERM shall transmit funds received into this account to the National Park Foundation (Foundation) which will manage the funds allocated for restoration efforts within the Hole in the Donut. The Foundation will provide the funds as needed to the Everglades National Park to implement the construction activities within the Hole in the Donut authorized by this permit and the long-term monitoring and maintenance of this restoration in accordance with the specifications of the attached tri-party memorandum of understanding.

22. One mitigation credit shall be assigned for each acre of wetlands to be restored pursuant to this permit. A maximum of 6,250 credits shall be available. Restoration activities cannot occur until such time that sufficient funds have been collected for construction and long-term maintenance/management of each phase of the project to be constructed. Therefore, mitigation credits for this project are available up-front, prior to initiation of any construction.

✓ 23. Within 60 days of permit issuance and prior to the commencement of work authorized by this permit, the permittee shall submit to the Bureau of Submerged Lands and Environmental Resources a long term management plan utilizing an "adaptive management" approach and addressing all aspects of on-going operations and management, including water management practices, vegetation establishment, exotic and nuisance species control, fire management and control of access. The adaptive management approach provides a means of regularly re-evaluating methodologies, strategies, and processes, based on monitoring and field results; therefore, it is anticipated that the long-term management plan may need to be

Permittee: Everglades National Park
Permit No: 132416479
Page 9

revised to reflect these refinements. This shall be accomplished through a minor modification request by the Park to the Bureau of Submerged Lands and Environmental Resources for review and approval.

24. The restoration work authorized by this permit shall be constructed in phases. Freshwater herbaceous wetland restoration within each phase shall be considered successful when all of the following criteria have been continuously met for a period of at least one growing season, without intervention in the form of irrigation, removal of undesirable vegetation, or replanting of desirable vegetation.

- a. The presence (species list) of wetland species listed in Rule 62-340, F.A.C. is statistically similar to a mutually acceptable species list for each community, based on the hydrologic pattern present to maintain the site(s) as wetland marsh (long hydrologic pattern) or prairie (short hydrologic pattern), defined in accordance with the vegetation classification system detailed on Attachment VI.
- b. Native species are reproducing naturally via seedling establishment and recruitment, or vegetative spread typical of each species;
- c. Exotic and nuisance species are limited to 1% cover or less in the aggregate;
- d. The importance value, based on frequency and percent cover or density, for each area shall fall within the range of Wittaker curves for the naturally occurring communities in this area of Everglades National Park;
- e. Not less than the total acreage of each parcel of freshwater wetlands are determined by Department staff to be jurisdictional pursuant to Rule 62-340, F.A.C., and
- f. The restored wetlands are constructed in accordance with the permit requirements, including any approved modifications.

25. The mitigation shall be determined to be successful when the requirements of Specific Condition No. 24 of the permit have been met. The procedures for requesting a success determination and guidelines for the Department's response are provided herein.

- a. The permittee may notify the Department whenever the permittee believes the mitigation is successful, but in no event earlier than two years after any particular phase of the mitigation is completed. This notice shall be sent by certified mail to the Chief, Bureau of

Permittee: Everglades National Park
Permit No: 132416479
Page 10

Submerged Lands and Environmental Resources at the
Department of Environmental Protection, 2600 Blair Stone
Road, Tallahassee, Florida 32399-2400.

- b. The notification shall include a copy of the most recent Annual Progress and Statistical Report and a narrative describing how the reported data support the contention that each of the mitigation criteria have been met. The permittee shall afford Department personnel the opportunity to schedule and conduct enough on-site inspection of the mitigation sites to determine whether the criteria are met. Each mitigation parcel may be successful at different times.
- c. Within one hundred twenty (120) days of receipt of this notice, the Department shall notify the permittee by certified mail that either the Department determined:
 - (1) That the mitigation has been successfully completed; or
 - (2) That the mitigation is not successful, identifying specifically those elements of the mitigation that do not meet the success criteria; or
 - (3) That the mitigation cannot be determined to be successful at this time, identifying specifically those elements of the mitigation that prevent it from determining whether the mitigation is successful.
- d. When the Department notifies the permittee that the mitigation is successful, then the permittee's mitigation obligation under the terms of the permit shall be deemed satisfied for that particular permit area.

26. The responsibility to determine if the mitigation is meeting the permit-specified success criteria shall not fall solely on the Department. In the event that the permittee becomes aware that the mitigation is not meeting the success criteria (based on site observation or review of monitoring reports), then the permittee, no later than six months before the permit expiration date, shall:

- a. submit an alternative mitigation plan to the Bureau of Submerged Lands and Environmental Resources in Tallahassee for review and approval;
- b. submit a long term obligation agreement; and
- c. submit \$500 mitigation fee, pursuant to FAC Rule 62.312.320(3).

Permittee: Everglades National Park
Permit No: 132416479
Page 11

No later than 60 days upon the Department approving the alternative mitigation plan, then the permittee shall implement the approved plan.

27. The permittee recognizes that it has a continuing obligation to continue monitoring the mitigation project and to correct any unsuccessful mitigation effort beyond the expiration date of the permit. If any portion of the mitigation area is not deemed to be successful twelve months prior to the permit expiration date, the permittee shall execute an agreement with the Department evidencing that obligation not less than nine months prior to the permit expiration date. The language that shall be used in this agreement is attached to this permit as Attachment IV.

28. Continued withdrawal of mitigation credits from the mitigation bank shall be contingent upon demonstration by the permittee, based on the annual reports required by this permit, that phases of the project for which mitigation credit have already been released have been constructed and are trending toward success.

If it is determined by the Department staff, based on visual inspection or review of the mitigation status reports, that construction of any phase of the project for which appropriate funds have been allocated has not occurred or indicate that any phase of the project which has been constructed is not trending toward success pursuant to Specific Condition No. 24 above, the Department shall notify the permittee and Dade County DERM that no more mitigation credits may be withdrawn from the Mitigation Bank until corrective actions have been taken.

The permittee shall submit a plan of corrective action within 30 days of the Department's notification. Upon completing the corrective actions identified in the plan, the permittee shall submit a report documenting the actions taken and dates completed.

Upon successful completion of the plan of corrective action, the Department shall notify the permittee and Dade County DERM that mitigation credits are again available for withdrawal.

29. Long-term monitoring and management is an integral part of any mitigation required by the Department. Mitigation is not completed when construction is finished. The permittee has an obligation to ensure that the mitigation will be successful and meet all of the success criteria in this permit.

- a. Management Plan. The management plan submitted for review and approval in accordance with Specific Condition No. 21 shall be fully implemented. Failure to comply with terms or deadlines of the plan may result in revocation or suspension of the permit.

- b. Management. The purpose of the periodic management of the mitigation site is to ensure that the plants within the site will survive and thrive. As part of ongoing management of the mitigation site, the permittee shall:
 - (1) Remove nuisance species from the mitigation site on an as-needed basis to meet the success criteria.
 - (2) Conduct supplemental plantings of desired wetland species to simulate a natural floristic composition, on an as-needed basis, reflecting the results of the annual reports performed in accordance with the "adaptive management" maintenance and management plan.
- c. Monitoring - The purpose of monitoring is to determine likelihood of the success of mitigation by periodic sampling using established sampling methods. Acceptable methods may be found in Daubenmire (1968), Green (1979), Grieg-Smith (1983), and Mueller-Dombois and Ellenberg (1974); alternatively, methods specified in Exhibit B of Attachment I may be used. The information needed to complete the Annual Progress and Statistical Reports shall be collected during each yearly monitoring.

The permittee shall monitor annually until the mitigation site is successful. The monitoring shall be implemented upon the completion of the construction of each mitigation site. At the end of the first three years of monitoring, the permittee may request in writing that the Bureau review the efficacy of the monitoring to determine whether or not the frequency or parameters of the monitoring program should be changed.
- d. The contingency plan may be addressed through a revision of the "adaptive management" approach long-term management plan as specified in Specific Condition #23. The revision, in the form of a minor modification request, must analyze why the list is not clearly trending towards success, proposed actions to ensure success, and proposed a schedule for implementation and completion of those actions. Upon approval, the permittee shall implement the actions pursuant to the approved schedule. The permittee is on notice that the failure to meet a single success criterion will prevent the mitigation site from meeting the success criteria of this permit.

Permittee: Everglades National Park
Permit No: 132416479
Page 13

Green, R.H. 1979. Sampling Design and Statistical Methods for Environmental Biologists. John Wiley & Sons, New York. 257 pp.

Grieg-Smith, P. 1983, 3rd Ed. Quantitative Plant Ecology. University of California Press, Berkeley.

Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and Methods of Vegetation Ecology. John Wiley, New York. 547 pp.

30. Reports shall be submitted annually within 60 days of data acquisition until a determination of success has been made by the Bureau and the Southeast District Office. These reports shall be submitted concurrent with the report required by the MOU between the Park and Dade County. The purpose of the Annual Reports is to provide a qualitative and quantitative depiction of the site that is representative of the conditions of the entire site. Data for each report shall be taken during the summer growing season. The first Annual Report data gathering shall occur not later than one year after substrate removal within the first parcel.

Each Annual Report shall include the following:

- a. On the cover page, just below the title, shall be certification of the following statement by the individual who supervised preparation of the report:
"This report represents a true, accurate, and representative description of the site conditions present at the time of the monitoring." Include the permit number, project name, and permittee name on the cover page.
- b. An updated Table 1 (format provided as Attachment III), which includes the total number of acres to date for which restoration funds have been received and for which mitigation credits have been withdrawn, the number of credits released since the previous annual report submittal, the total number of acres of wetlands restored to date and the maximum number of mitigation credits available.
- c. Progress report which shall describe the following as appropriate for each mitigation parcel:
 - (1) Date permitted activity was begun or is anticipated to begin;
 - (2) Brief description of extent of work completed since the previous report or since permit was issued;
 - (3) Indication on copies of the permit drawings those areas where work has been completed;

Permittee: Everglades National Park
Permit No: 132416479
Page 14

- (4) A description of:
 - i. problems encountered and solutions undertaken; and
 - ii. mitigation site management undertaken, including type of management and dates each type was undertaken.
 - (5) Brief description of the work the permittee anticipates commencing, continuing or completing in the next year. The permittee shall indicate on copies of the permit drawings those areas where it is anticipated that work will be done;
 - (6) A copy of the permit drawings which depicts the proposed jurisdictional boundaries of the mitigation site and superimpose the actual jurisdictional boundaries on the figure, including the date that the jurisdictional determination was made; and
 - (7) Photographs of the mitigation sites taken from the same permanent stations.
- d. Statistical report which shall include for each mitigation site.
- (1) The date(s) that the on-site monitoring occurred;
 - (2) Sampling Methodology used; and
 - (3) A current "Minimum Annual Mitigation Monitoring Requirements" table (Attachment V) for each site.

31. The permittee is required to demonstrate financial responsibility for both the construction and implementation of each phase of the Mitigation Bank and for the long-term management of the Mitigation Bank, or phase thereof. The specifications of the attached tri-party MOU (Attachment I) provide for the collection and allocation of funds sufficient for the implementation and long-term management of the Mitigation Bank.

MONITORING REQUIRED:

Vegetation and hydrologic monitoring shall be conducted in accordance with the specifications identified in the document entitled "Restoration of Former Wetlands within the Hole in the Donut in Everglades National Park; Project Plans and Specifications" and shall comply with the guidelines identified in Specific Condition No. 30.

Annual monitoring reports shall be furnished to the Bureau of Submerged Lands and Environmental Resources and the Department's Submerged Lands and Environmental Resources Program, Southeast

Permittee: Everglades National Park
Permit No: 132416479
Page 15

District office in West Palm Beach. These reports shall be submitted concurrent with the annual report required by the M.O.U. It is the responsibility of the permittee to ensure that the monitoring report provides a qualitative and quantitative depiction of the restored parcels that is representative of the conditions of these sites.

Recommended by Custance Bersek.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

Kathy B. Gurnea for
Virginia B. Wetherell, Secretary

124 pages attached.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Carmel A. Randi 2/17/95
Clerk Date

PERMIT NO. 13241049

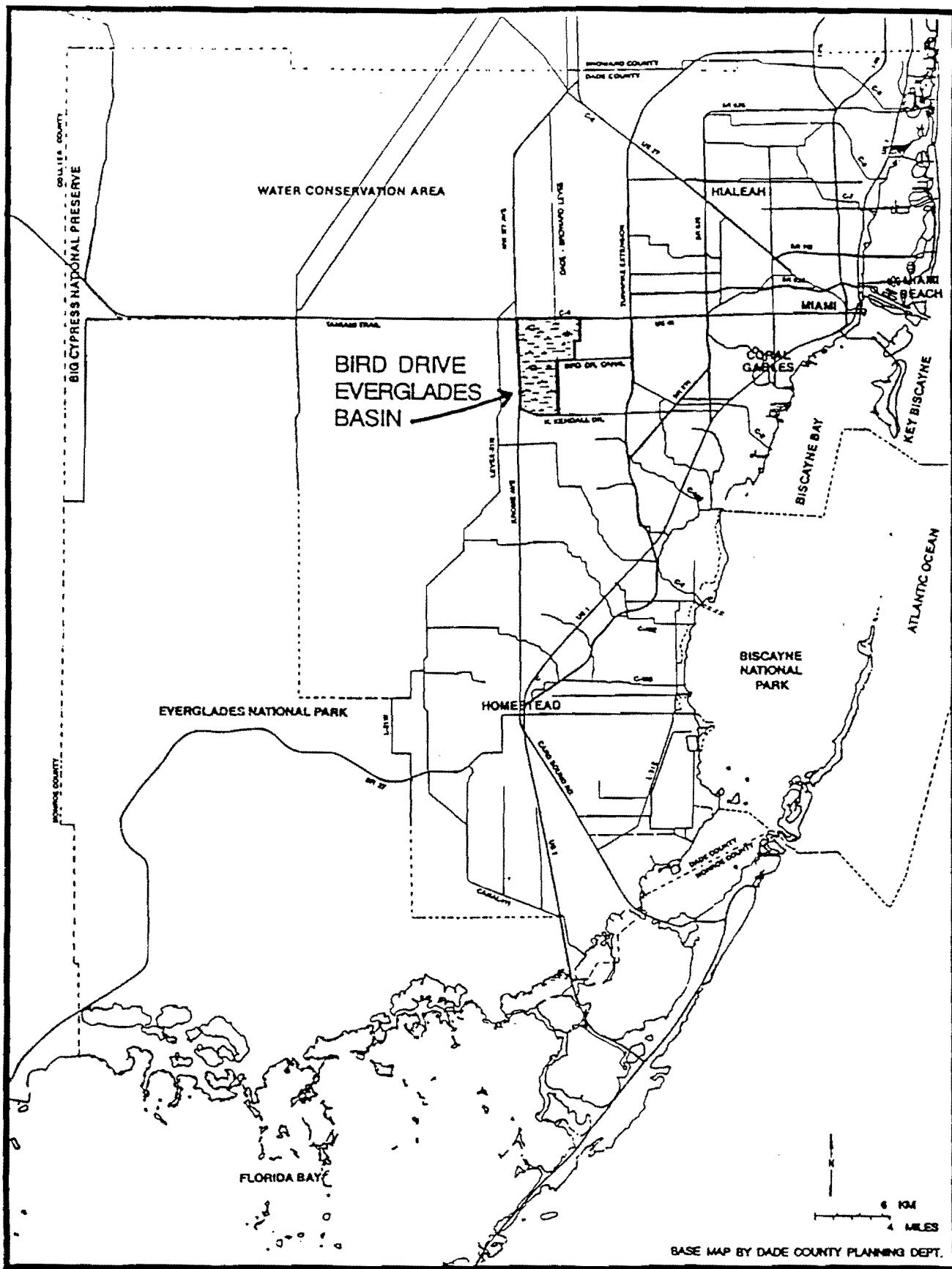


Figure 1. General location of the Bird Drive Everglades Basin in Dade County, Florida.

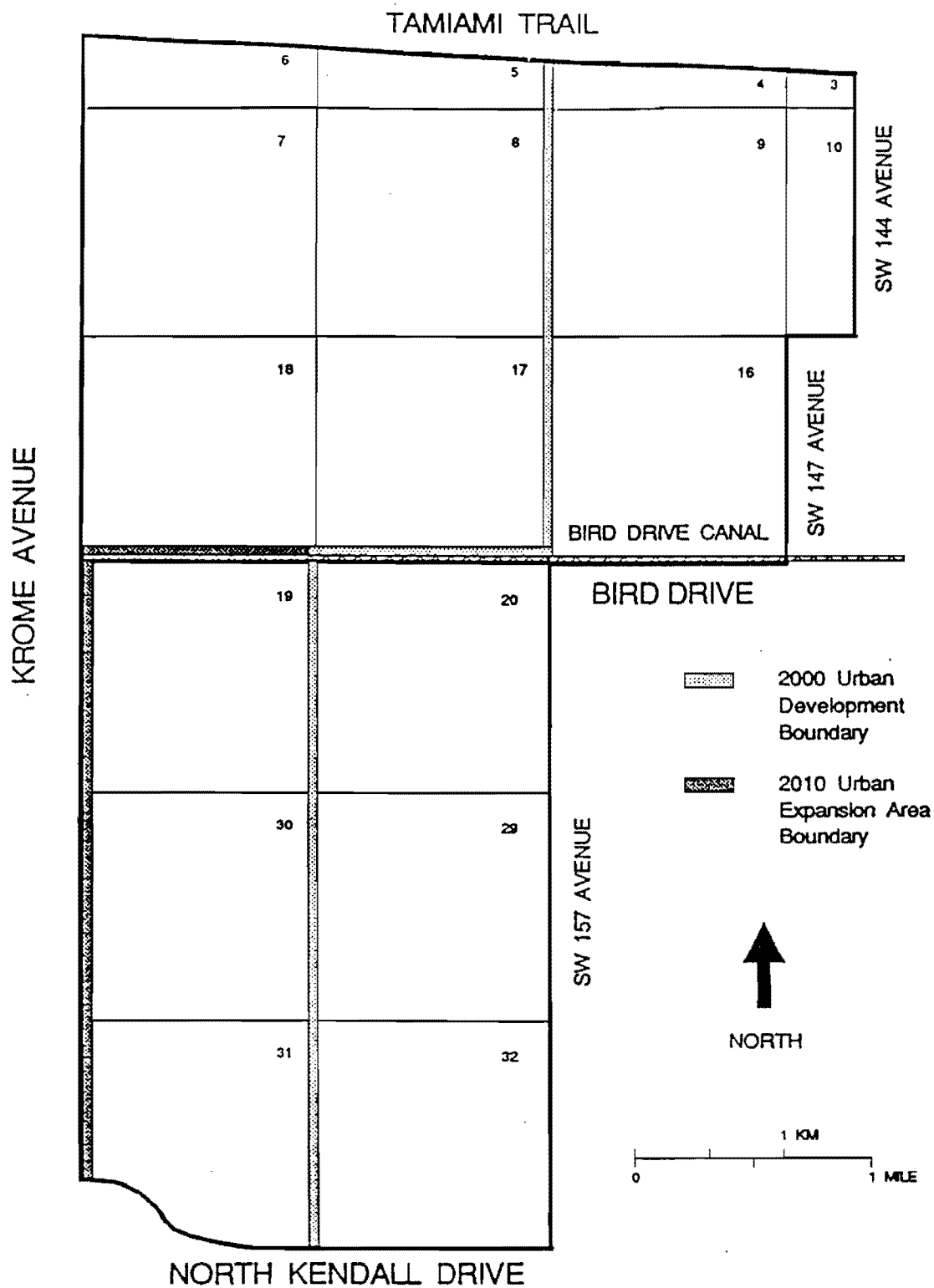


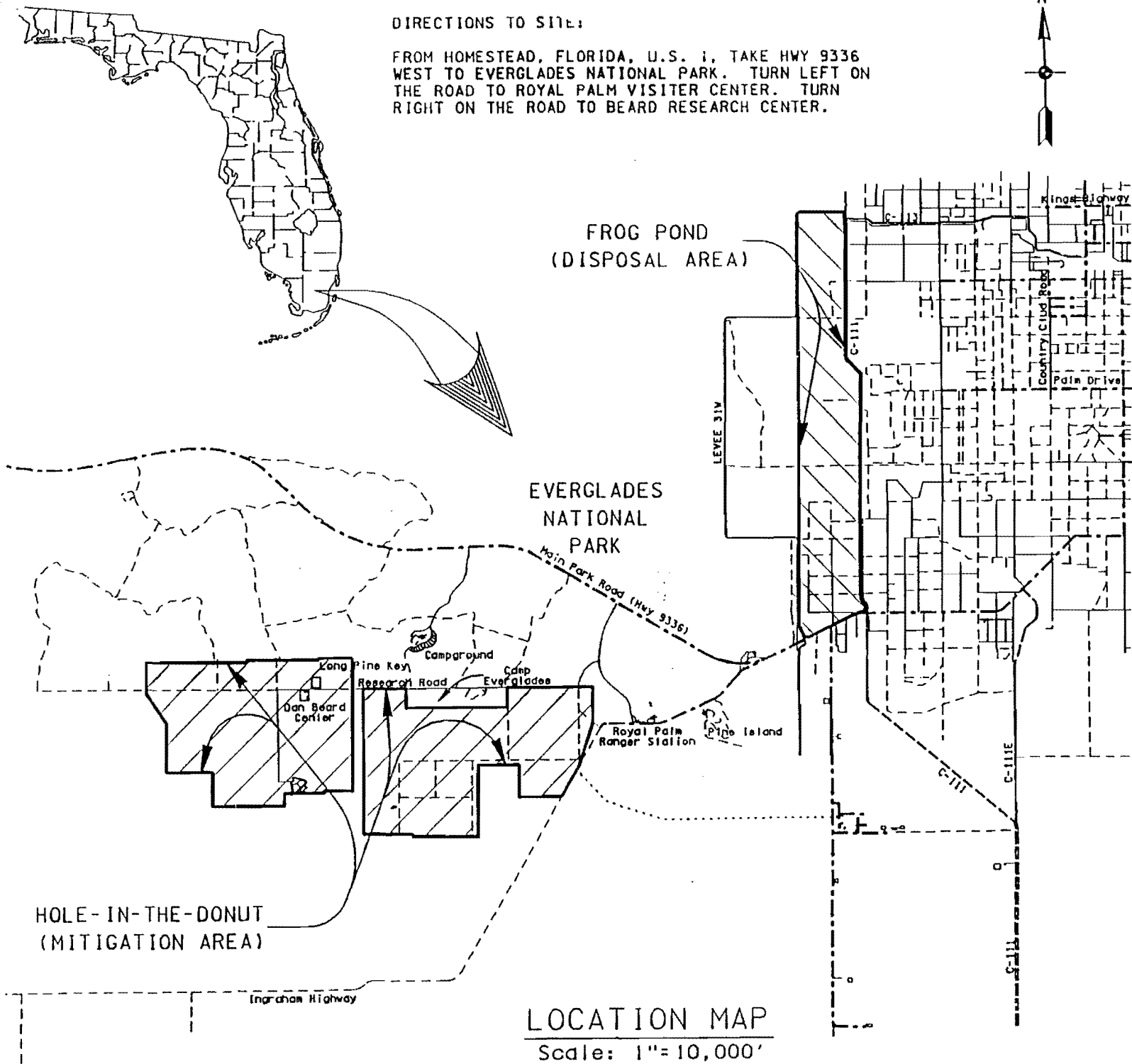
Figure 5. The Bird Drive Everglades Basin showing the year 2000 Urban Development Boundary and the year 2010 Urban Expansion Area Boundary. The part of the Basin within the Urban Development Boundary is designated as "Urban Development Subject to Wetland Basin Study" in Dade County's Comprehensive Development Master Plan.

PERMIT NO. 132416429



DIRECTIONS TO SITE:

FROM HOMESTEAD, FLORIDA, U.S. 1, TAKE HWY 9336 WEST TO EVERGLADES NATIONAL PARK. TURN LEFT ON THE ROAD TO ROYAL PALM VISITER CENTER. TURN RIGHT ON THE ROAD TO BEARD RESEARCH CENTER.



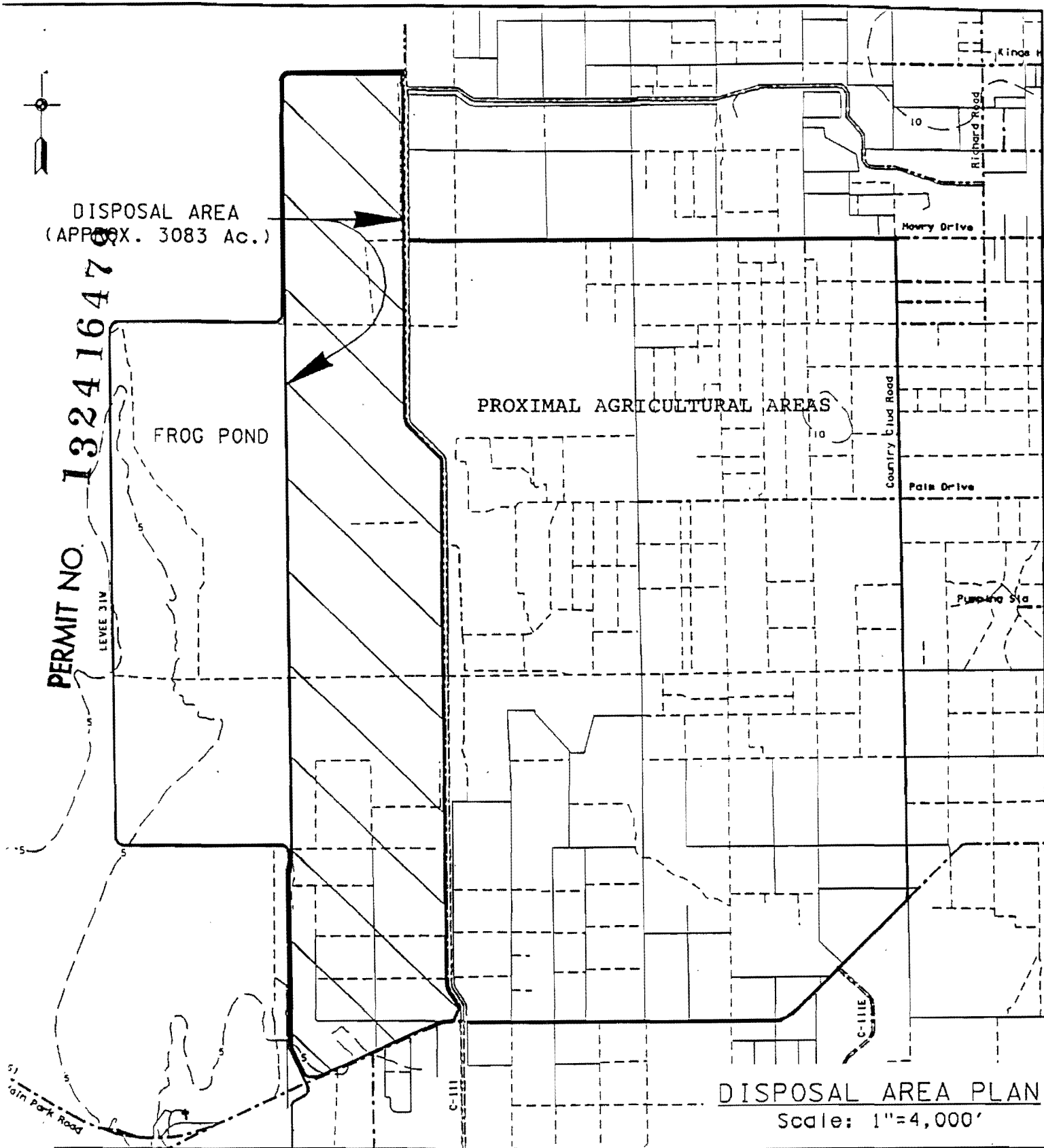
LOCATION MAP

Scale: 1"=10,000'

APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 1 OF 6
 DATE: December 1992

CESAL-EN-DL (O.L.N.)



APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

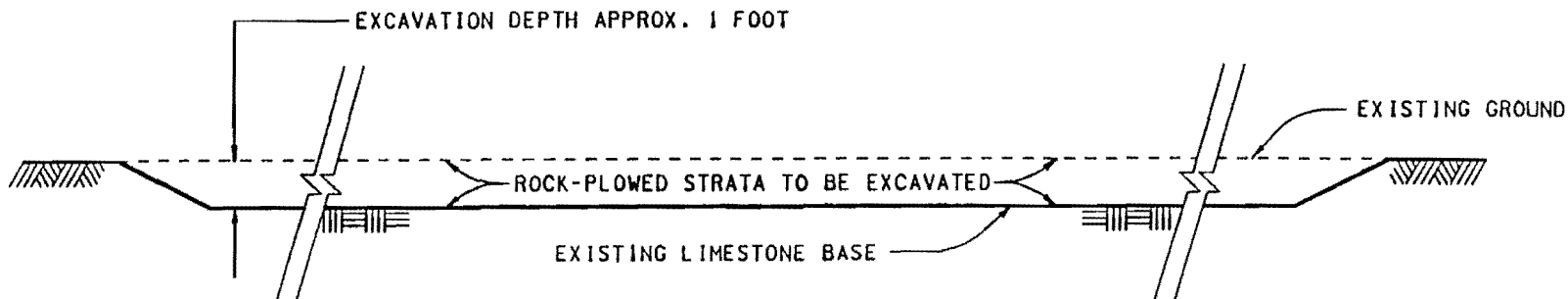
PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 3 OF 6 SEP
 DATE: December 1992

CESAJ-EN-DL (D.L.N.)

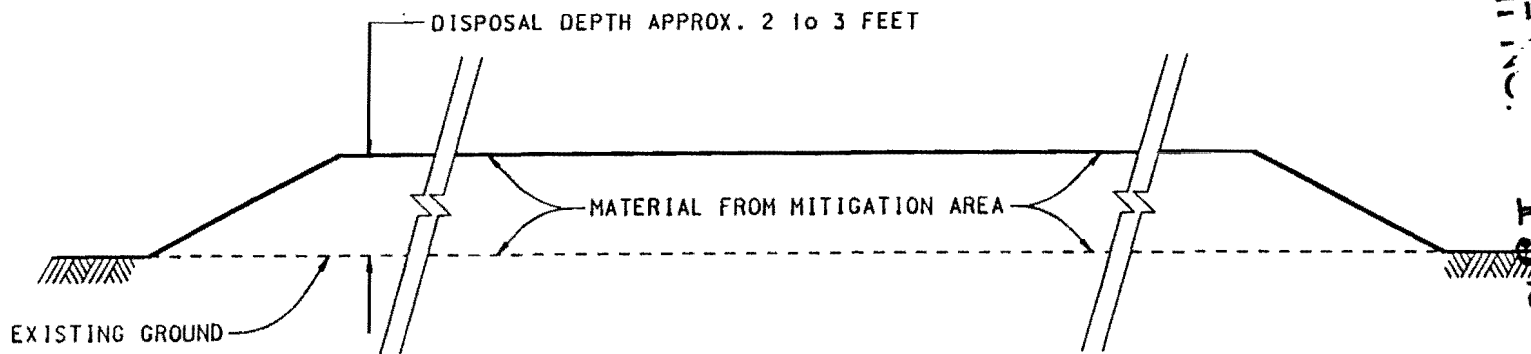
APPLICANT: Everglades National Park
WATER BODY: N/A
COUNTY: Dade
DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
ORIGINAL WORK ☒ MAINTENANCE ☐
SHEET NO.: 4 OF 6
DATE: December 1992

CESAJ-EN-DL (D.L.N.)



TYPICAL CROSS SECTION, MITIGATION AREA



TYPICAL CROSS SECTION, DISPOSAL AREA

TYPICAL CROSS SECTIONS

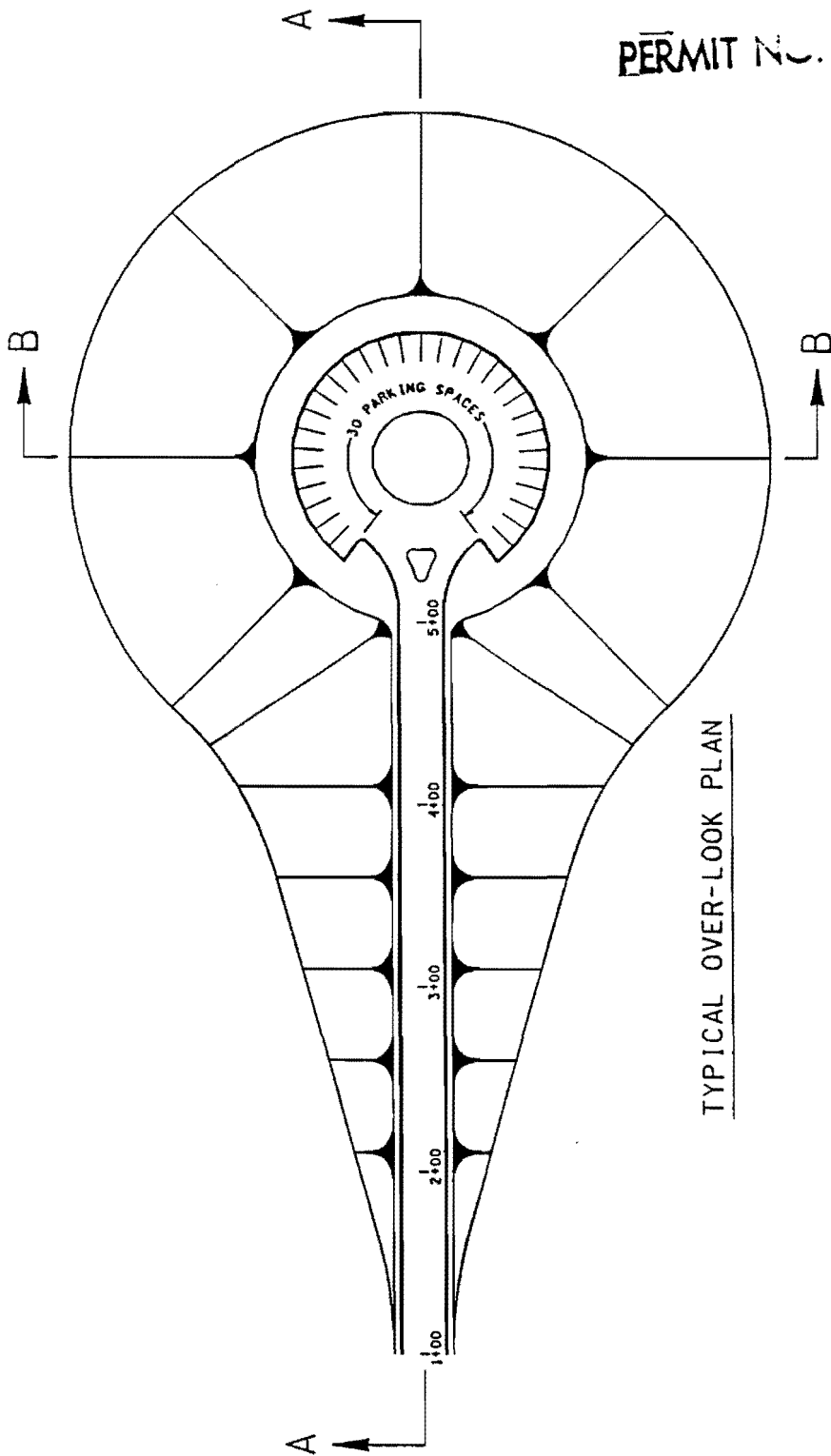
Not To Scale

PERMIT NO.

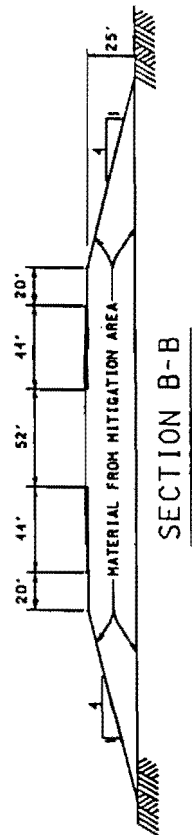
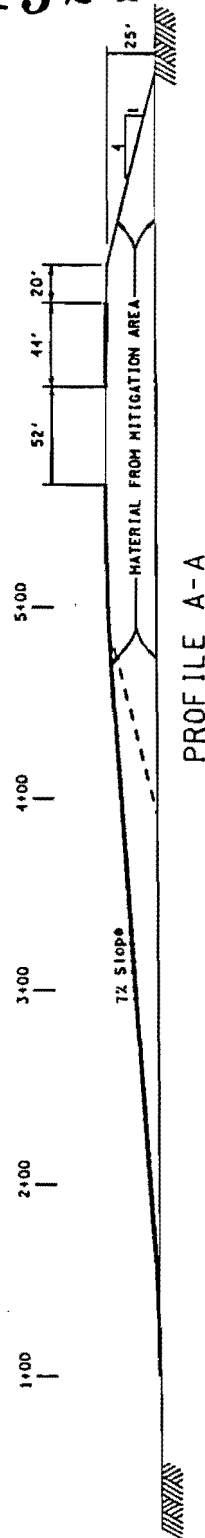
132416479

RECEIVED
RES. ENG.
DEC 17 1992

PERMIT NO. 132415479



TYPICAL OVER-LOOK PLAN



OVER-LOOK PLAN,
PROFILE AND X-SECTION

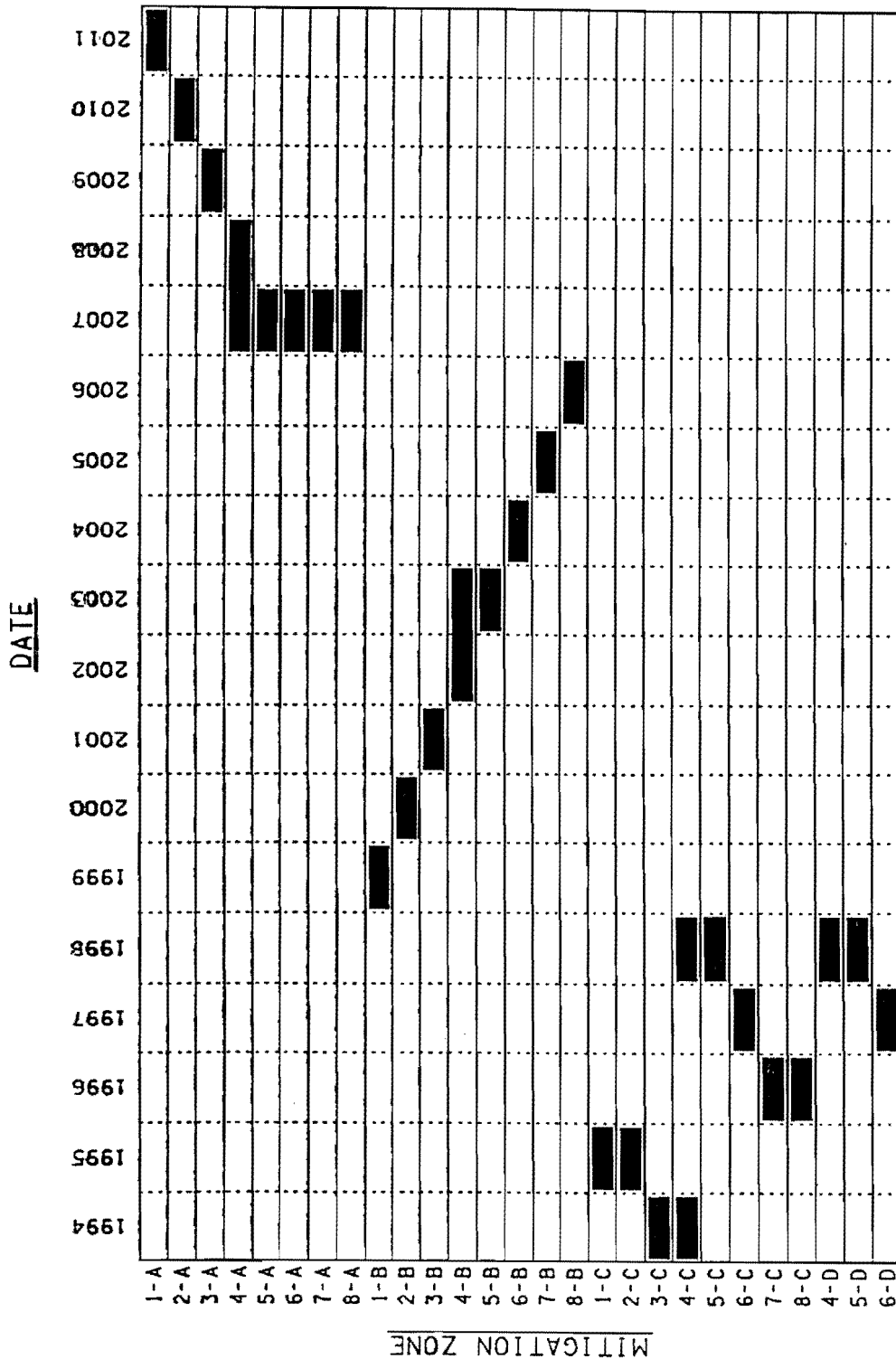
SCALE: 1"=100'

APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 5 OF 6
 DATE: December 1992

CESAJ-EN-DL (D.L.N.)

PERMIT NO. 132416479



MITIGATION PHASING DIAGRAM

NOTE:
FOR MITIGATION ZONES,
SEE SHEET NO. 2.

APPLICANT: Everglades National Park
 WATER BODY: N/A
 COUNTY: Dade
 DATUM: N.G.V.D. of 1929

PURPOSE: Restore Wetlands
 ORIGINAL WORK ☒ MAINTENANCE ☐
 SHEET NO.: 6 OF 6
 DATE: December 1992

INDEX OF ATTACHED DOCUMENTS

Permit No. 132416579, Everglades National Park

Hole-in-the-Donut Mitigation Bank

Attachment I: Memorandum of Understanding between Everglades National Park, the National Park Foundation, and Metropolitan Dade County, Department of Environmental Resource Management

Exhibit A: Fund Transfer

Exhibit B: Project Plan and Specifications

Attachment II: Memorandum of Understanding between Florida Department of Environmental Regulation (Protection) and Metropolitan Dade County, Department of Environmental Resource Management

Attachment III: Table 1 (Mitigation Credit Availability Update)

Attachment IV: Long-term Agreement

Attachment V: Minimum Annual Mitigation Monitoring Requirements

Attachment VI: Plant Community Types Vegetation Classification System for South Florida National Parks

PERMIT NO. 132416479



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 14, 1996

Everglades National Park
c/o Mr. Robert Doren
P.O. Box 279
Homestead, Florida 33030

Dear Mr. Bob Doren:

File No. 132416479, Dade County
Everglades National Park

A recent review of the file revealed that the expiration date on the final permit was incorrect. The correct expiration date is **February 15, 2015.**

This correction will not change the evaluation of water quality and public interest. The permit is hereby modified as noted. By copy of this letter, we are notifying all necessary parties of the modification.

This letter only corrects the permit expiration date and does not alter the original Specific or General Conditions or monitoring requirements of the permit. This letter must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request

an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

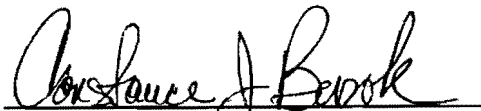
If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Everglades National Parks
Permit 132416479
Page 3

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,

A handwritten signature in dark ink, appearing to read "Constance J. Bersok", written over a horizontal line.

Constance J. Bersok
Environmental Administrator
Bureau of Submerged Lands and
Environmental Resources

CJB/chr

cc:

Larry o' Donnell, DEP, Southeast District
Florida Marine Patrol
U.S. Army Corps of Engineers, (COE# 199301691) Jacksonville
Game and Freshwater Fish Commission
Submerged Lands and Environmental Resources Permit File
Leigh O' Shields, DEP, State Lands
Dade County Property Appraiser
Silvia Morell Alderman

Everglades National Parks
Permit 132416479
Page 4

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Camela H. Randolph 2/14/96
Clerk Date

Attachment I

31A) (95)
12-17-93.
R-1582-93

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE UNITED STATES DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
EVERGLADES NATIONAL PARK
AND
THE NATIONAL PARK FOUNDATION
AND
METROPOLITAN DADE COUNTY
DEPARTMENT OF ENVIRONMENTAL RESOURCES
MANAGEMENT
REGARDING
RESTORATION OF WETLANDS
IN THE HOLE-IN-THE-DONUT

JUN 8 1994

PERMIT NO. 132416479

TABLE OF CONTENTS

MEMORANDUM OF UNDERSTANDING	1
ARTICLE I. <u>BACKGROUND AND OBJECTIVES</u>	1
ARTICLE II. <u>STATEMENT OF WORK</u>	3
A. <u>PARK'S RESPONSIBILITIES</u>	3
<u>Implementation of Restoration</u>	3
<u>Preparation and Submission of Reports</u>	4
<u>Receipt of Funds by the FOUNDATION on behalf of the</u>	
<u>PARK</u>	4
<u>Maintenance of Records</u>	4
<u>Access to Records</u>	4
B. <u>FOUNDATION'S RESPONSIBILITIES</u>	5
<u>Receipt of Funds by the FOUNDATION on behalf of the</u>	
<u>PARK</u>	5
<u>FOUNDATION to Manage Funds Received</u>	5
<u>Maintenance of Records</u>	5
<u>Access to Records</u>	5
<u>Preparation and Submission of Reports</u>	6
C. <u>COUNTY'S RESPONSIBILITIES</u>	6
<u>Review and Implementation of Program</u>	6
<u>Identification of Hole-in-the-Donut Contribution Amounts</u> ...	6
<u>Crediting to Index Code of Hole-in-the-Donut Contribution</u>	
<u>Amounts</u>	7
<u>Transfer to the FOUNDATION of Hole-in-the-Donut</u>	
<u>Contribution Amounts</u>	7
<u>Maintenance of Records</u>	7
<u>Access to Records</u>	7
<u>Preparation and Submission of Reports</u>	8
ARTICLE III. <u>TERM(S) OF AGREEMENT</u>	8
ARTICLE IV. <u>KEY OFFICIALS</u>	8
<u>PARK</u>	8
<u>COUNTY</u>	9
<u>FOUNDATION</u>	9
ARTICLE V. <u>PROPERTY UTILIZATION</u>	9
ARTICLE VI. <u>PRIOR APPROVAL</u>	9
ARTICLE VII. <u>REPORTS</u>	9
ARTICLE VIII. <u>AMENDMENT</u>	10
ARTICLE IX. <u>TERMINATION</u>	10
ARTICLE X. <u>REQUIRED CLAUSES</u>	11
ARTICLE XI. <u>NOTICES</u>	11
ARTICLE XII. <u>VENUE</u>	12
IN WITNESS WHEREOF	13
NATIONAL PARK SERVICE	13
NATIONAL PARK FOUNDATION	13
DADE COUNTY	13
EXHIBIT A	14
EXHIBIT B	15
ABSTRACT	16

PERM 1324 16479

INTRODUCTION	17
STUDY AREA	18
MATERIALS AND METHODS	19
Substrate Removal and Surveying	19
Data Sampling	19
Vegetation Sampling	20
Hydrological Sampling	20
Substrate Nutrient Sampling	20
Vesicular-Arbuscular Mycorrhizae (VAM) Fungi Sampling	21
Data Analysis	22
Vegetation Data	22
Hydrological Data	22
VAM Fungi Data	23
RESULTS	23
Substrate Removal and Surveying	23
Data Sampling	23
Vegetation Sampling	23
DISCUSSION	24
ACKNOWLEDGEMENTS	24
<u>LITERATURE CITED</u>	26
Table 1. Partial listing of species colonizing the mitigation site in the Hole-in-the-Donut.	30
Figure 1. Flow chart showing general pattern of succession on farmland abandoned without the effects of rock-plowing and with the effects of rock-plowing.	32
Figure 2. Map of southern Florida and Everglades National Park, indicating the area of the Hole-in-the-Donut.	34
Figure 3. Map of the Hole-in-the-Donut showing the location of the mitigation site.	36
ENGINEERING SPECIFICATIONS	37
A. Topography and Control Sheets	37
B. Aerial Photography for Production of the Topography and Control Sheets	37
C. Bench Mark	38
D. Vegetation Clearing	38
E. Substrate Removal	38
F. Continuous-Monitoring Hydrological Well	39
G. Staging Area	40
H. Time Frames	40
I. Final Considerations - Engineering Specifications	40
MONITORING AND STUDY SPECIFICATIONS	41
Overview	41
A. Vegetation Sample Plots	41
B. Photopoints	42
C. Hydrological Sampling	42
D. Additional Environmental Monitoring	42
E. Substrate Nutrient Analysis	42
F. Additional Responsibilities of Contractor(s)	43
DATA ANALYSIS	43
A. Vegetation	43

B. Hydrology Data	43
<u>LITERATURE CITED</u>	44
TABLE 2. Per Acre Budget	48

PERMIT NO. 132416479

MEMORANDUM OF UNDERSTANDING

BETWEEN

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
EVERGLADES NATIONAL PARK
40001 STATE ROAD 9336
HOMESTEAD, FLORIDA 33034-6733

AND

NATIONAL PARK FOUNDATION
1101 17TH STREET, SUITE 1102
WASHINGTON, D.C. 20036

AND

METROPOLITAN DADE COUNTY
DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT
PROFESSIONAL SAVINGS BANK BUILDING
33 SW 2ND AVENUE
MIAMI, FLORIDA 33130

PERMIT NO. JUN 20 1994

132416479

THIS AGREEMENT (hereinafter the "AGREEMENT") is made and entered into this
14 day of Dec. 1993, by and between the United States Department of the Interior,
National Park Service, Everglades National Park (hereinafter the "PARK"), the National Park
Foundation (hereinafter the "FOUNDATION") and Metropolitan Dade County, a political
subdivision of the State of Florida (hereinafter the "COUNTY").

ARTICLE I.

BACKGROUND AND OBJECTIVES

WHEREAS, 48 STAT. 816 passed May 30, 1934, provided for the establishment of
Everglades National Park in the State of Florida; and

WHEREAS, Public law 90-583 (1968) provides for the control of noxious plants on federal
lands, and Executive Order 11987, issued May 29, 1977, calls for restrictions on the introduction
of exotic species into natural ecosystems on Federal lands; and

WHEREAS, Everglades National Park in its "General Management Plan" (1979) recognized the Park's responsibilities to "control exotic plant and animal species when necessary to prevent disruption to native communities"; and

WHEREAS, The Everglades National Park Master Plan and the Resource Management Plan address the issue of mitigating the effects of exotics, particularly the successional trends in the area known as the Hole-in-the-Donut in Everglades National Park (Exhibit A); and

WHEREAS, 39 STAT. 535, passed August 25, 1916, enables Everglades National Park to enter into Agreement with other agencies and persons; and

WHEREAS, Public Law 90-209 of the 90th U. S. Congress, December 18, 1967 established the National Park Foundation; and

WHEREAS, the FOUNDATION is empowered by Congress to act on behalf of the PARK with regard to the acceptance and management of funds or income; and

WHEREAS, the COUNTY and the PARK have agreed to establish a cooperative program to implement control of exotic plants in the Hole-in-the-Donut; and

WHEREAS, on July 21, 1992, the Dade County Board of County Commissioners created Section 24-58.21 of the Code of Metropolitan Dade County, which established the Freshwater Wetland Mitigation Trust Fund (FWMT Fund) for receiving mitigation contributions from developers in the Bird Drive Everglades Wetland Basin and the North Trail Wetland Basin; and the COUNTY represents that (1) this AGREEMENT has been duly authorized, executed and delivered by the Board of County Commissioners as the governing body of the COUNTY, and (2)

PERMIT NO. 132410429

it has the required power and authority to perform this AGREEMENT.

WHEREAS, the FWMT Fund was created for use in acquiring (including by eminent domain), restoring, enhancing, managing or monitoring freshwater wetlands within Dade County.

NOW, THEREFORE, in consideration of these premises and mutual covenants contained herein, the parties agree as follows:

ARTICLE II. STATEMENT OF WORK

A. PARK'S RESPONSIBILITIES

1) Implementation of Restoration. The PARK agrees to, and shall be solely responsible for implementing, the program in accordance with the general procedures and methods contained in the document entitled, Restoration of Former Wetlands within the Hole-in-the-Donut in Everglades National Park: Project Plan and Specifications, attached hereto as Exhibit B. The PARK shall be solely responsible for obtaining all of the required federal, state and local permits for the performance of the work, writing and awarding of contracts or cooperative AGREEMENTS regarding implementation of work, scheduling, hiring and payment of personnel, purchase or rental of supplies, materials and equipment or other project support as necessary. The PARK may, at its sole discretion, add to or modify the methods or procedures contained in Exhibit B as deemed necessary or appropriate based on information from the results of previous or ongoing project work, monitoring data or study results in order to improve or enhance any of the elements or purposes of this project as described in this AGREEMENT, provided, however, that such modification shall not alter the PARK'S obligation to mitigate the number of acres for which payments have been committed prior to such modification pursuant to this AGREEMENT. This AGREEMENT, including all appendices, attachments and codicils shall not under any of its terms, limitations or conditions be considered by any of the parties to this AGREEMENT to encumber or

PERMIT NO. 132416479

JUN 20 1994

PERMIT NO. 132416479

otherwise in any way limit the use or direction of funds received from sources other than those described within this AGREEMENT by the FOUNDATION on behalf of the PARK.

2) Preparation and Submission of Reports. The PARK shall provide to the COUNTY documentation and reports, as specified in Article VI of this AGREEMENT, sufficient to verify satisfactory completion of work in accordance with Exhibit "B". Annual reports shall be generated by the PARK and provided to the COUNTY and the FOUNDATION for distribution to any parties of their choosing. The PARK's reports shall include a general description of the work performed to date, discussion of monitoring results (as these become available) or general observations, as well as a summary of expenditures to date.

3) Receipt of Funds by the FOUNDATION on behalf of the PARK. The PARK agrees and represents that receipt by the FOUNDATION of fund(s) from the COUNTY in accordance with the provisions of this AGREEMENT shall constitute receipt by the PARK of the funds for use in implementing the Hole-in-the-Donut project in accordance with Exhibit "B".

4) Maintenance of Records. The PARK shall keep accounting records which conform with generally accepted accounting principles which shall include, but not be limited to, a cash receipt journal, general ledger, and all such subsidiary ledgers as reasonably necessary. All such records will be retained by the PARK for not less than five (5) years beyond the term of this AGREEMENT.

5) Access to Records. The PARK shall provide access to all their records of or relating to this project and AGREEMENT, and agrees to provide such assistance as may be necessary to facilitate their review by the COUNTY or the FOUNDATION when deemed necessary by either to insure compliance with accounting and financial standards. The COUNTY or the FOUNDATION shall have the right to access all records for not less than five (5) years beyond the term of this

AGREEMENT. The PARK shall make all records or documents which relate to this AGREEMENT available to the COUNTY or the FOUNDATION at the PARK's offices during regular business hours.

- 6) Nothing in this AGREEMENT shall be construed to require the PARK to expend funds that have not been lawfully appropriated and administratively allocated for such purposes.

B. FOUNDATION'S RESPONSIBILITIES

1) Receipt of Funds by the FOUNDATION on behalf of the PARK. The FOUNDATION agrees to accept, on behalf of the PARK, and solely for the purposes as outlined in this AGREEMENT, the principal amounts received from the COUNTY's above-described revenue index code of the FWMT Fund.

2) FOUNDATION to Manage Funds Received. The FOUNDATION shall manage the funds received from the above-described index code of the FWMT Fund solely for the benefit of the PARK in order to provide solely for the implementation of the work and projects outlined in this AGREEMENT and any attachments, exhibits, appendices or codicils.

3) Maintenance of Records. The FOUNDATION shall keep accounting records which conform with generally accepted accounting principles which shall include, but not be limited to, a cash receipt journal, general ledger, and all such subsidiary ledgers as reasonably necessary. All such records will be retained by the FOUNDATION for not less than five (5) years beyond the term of this AGREEMENT.

4) Access to Records. The FOUNDATION shall provide access to all their records of or relating to this project and AGREEMENT, and agrees to provide such assistance as may be necessary to

JUN 20 1994

PERMIT NO.

132416479

by mutual written agreement of the COUNTY and the PARK. The Assistant County Manager and the Everglades National Park Superintendent are authorized to provide the written AGREEMENT required to amend Exhibit "A".

JUN 20 1991

PERMIT NO

132416479

3) Crediting to Index Code of Hole-in-the-Donut Contribution Amounts. The COUNTY shall credit to a revenue index code within the FWMT Fund the percentage of the mitigation amount received in accordance with paragraph 3 above. Interest accrued on this principal amount prior to disbursement to the FOUNDATION shall be retained by the COUNTY for use for administrative costs.

4) Transfer to the FOUNDATION of Hole-in-the-Donut Contribution Amounts. The COUNTY shall, within 30 days of the end of each month, transfer to the FOUNDATION those principal amounts accrued in the above-described revenue index code of the FWMT Fund.

5) Maintenance of Records. The COUNTY shall keep accounting records which conform with generally accepted accounting principles which shall include, but not be limited to, a cash receipt journal, general ledger, and all such subsidiary ledgers as reasonably necessary. All such records will be retained by the COUNTY for not less than five (5) years beyond the term of this AGREEMENT.

6) Access to Records. The COUNTY shall provide access to all its records of or relating to this project and AGREEMENT, and agrees to provide such assistance as may be necessary to facilitate their review by the PARK or the FOUNDATION when deemed necessary by the either to insure compliance with accounting and financial standards. The PARK or the FOUNDATION shall have the right to access all records for not less than five (5) years beyond the terms of this AGREEMENT. The COUNTY shall make all records or documents which relate to this

AGREEMENT available to the PARK or the FOUNDATION at the COUNTY'S offices during regular business hours.

7) Preparation and Submission of Reports. Annual reports shall be generated by the COUNTY and provided to the PARK and FOUNDATION for distribution to any parties of their choosing. The COUNTY's reports shall include a summary of all activities (e.g., deposits, transfers, expenditures, land purchases, etcetera) of the above-described revenue index code of the FWMT Fund.

ARTICLE III. TERM(S) OF AGREEMENT

(1) Initial Term. This AGREEMENT shall have an initial term of TWENTY (20) years, beginning on the latest day and year noted on the WITNESS page of this AGREEMENT.

(2) Renewal Term(s). This AGREEMENT may be renewed upon the same terms and conditions for up to TWO (2) additional FIVE (5) year terms by mutual written agreement of all parties.

(3) Continuation of this AGREEMENT (in whole or in part) beyond the term specified in ARTICLE III, Item 1 above is contingent upon the availability of funds.

ARTICLE IV. KEY OFFICIALS

PARK: The Superintendent of Everglades National Park will provide review and approval of terms of all agreements and will exercise the authority to approve conduct of cooperative projects regarding Everglades National Park. Robert F. Doren, Assistant Research Director, will act as the contracting officers' authorized technical representative with regard to the technical scope of this AGREEMENT. The Contracting Officer with the National Park Service (NPS),

Everglades National Park, will provide contracting authority and fiscal control for the PARK. The PARK shall provide written notice to DERM and FOUNDATION of any change in key officials within thirty (30) days of such change.

JUN 20 1994

COUNTY: The Director of DERM will provide review and approval of terms of all agreements and will exercise the authority to approve conduct of cooperative projects regarding Dade County. Frank Bernardino, Environmental Resource Project Supervisor, shall act as the authorized technical representative for DERM with regard to the technical scope of this AGREEMENT. The COUNTY shall provide written notice to the PARK and FOUNDATION of any change in authorized technical representative within thirty (30) days of such change.

PERMIT NO.

FOUNDATION: The ^{President} Director of the FOUNDATION will provide review and approval of terms of all agreements and will exercise the authority to approve conduct of cooperative projects regarding The National Park FOUNDATION. The Controller with the National Park FOUNDATION, will provide contracting authority and fiscal control for the FOUNDATION. The FOUNDATION shall provide written notice to the PARK and COUNTY of any change in authorized technical representative within thirty (30) days of such change

132416479

ARTICLE V. PROPERTY UTILIZATION N/A

ARTICLE VI. PRIOR APPROVAL N/A

ARTICLE VII. REPORTS

Reports shall be prepared and submitted as previously described for each party in ARTICLE II above. Reports shall be due by each agency ninety (90) days after the end of the

respective agencies fiscal year.

ARTICLE VIII. AMENDMENT

This AGREEMENT may be modified by amendment upon mutual written agreement of all parties.

ARTICLE IX. TERMINATION

(1) This AGREEMENT shall terminate automatically unless the same is extended by mutual written agreement prior to twenty (20) years from the latest date of authorized signature upon the WITNESS page, provided, however, that this AGREEMENT shall NOT terminate until the PARK has completed the amount of mitigation required under the terms of the AGREEMENT for the funds already transferred to the FOUNDATION on behalf of the PARK for this project, from the above-described revenue index code of the FWMT Fund. During the term of this AGREEMENT, should further funds become unavailable, this AGREEMENT shall NOT terminate until the PARK has completed the amount of mitigation required under the terms of the permit for this AGREEMENT for the funds already transferred to the FOUNDATION on behalf of the PARK for this project, from the above-described revenue index code of the FWMT Fund.

(2) Either the PARK or the COUNTY may terminate this AGREEMENT at any time by providing ninety (90) days written notice to the other party. The PARK shall complete all mitigation work for which principal monies have been remitted by the COUNTY. Receipt of written notice from the PARK, issued upon completion of the mitigation work for monies remitted up to the point of written notice of termination, shall constitute the date of termination of this AGREEMENT.

ARTICLE X.

REQUIRED CLAUSES

"During the performance of this AGREEMENT, the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin."

"No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this AGREEMENT, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this AGREEMENT if made with a corporation for its general benefit."

PERMIT NO. 132410469

ARTICLE XI.

NOTICES

All notices required or permitted to be given under the terms and provisions of this AGREEMENT by either party to the other shall be in writing and shall be sent by registered or certified mail, return receipt requested, to the parties as follows:

As to the COUNTY:

John W. Renfrow, Director
Dade County Department of Environmental Resources Management
Professional Savings Bank Building
33 S.W. 2nd Avenue
Miami, Florida 33130

As to the PARK:

Richard Ring, Superintendent
Attn.: Robert F. Doren
Everglades National Park
40001 State Road 9336
Homestead, Florida 33034-6733

or to such other address as may hereafter be provided by the parties in writing. Notices by registered or certified mail shall be deemed received on the delivery date indicated by the U.S. Postal Service on the return receipt.

ARTICLE XII. VENUE

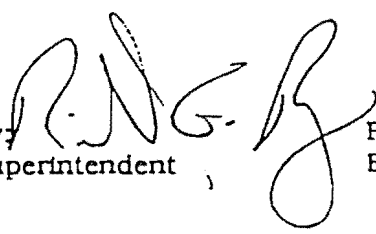
Any litigation hereunder shall be brought in the applicable state or federal court in Dade County, Florida. The liability of the United States for the acts and omissions of its employees arising out of this AGREEMENT shall be governed by the Federal Tort Claims Act.

PERMIT NO. 132416479

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed
by their duly authorized representative(s) on the latest day and year noted below.

JUN 20 1994

NATIONAL PARK SERVICE

By: 
Superintendent

Richard Ring
Everglades National Park

Date

8/15/93

By:
Contracting Officer


Sherry Dague
Everglades National Park

Date

8/4/93

NATIONAL PARK FOUNDATION

By:
President


Alan Rubin
National Park Foundation

Date

8/30/93

By:
Controller


Chris Jerussi
National Park Foundation

Date

8/30/93

DADE COUNTY

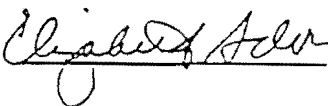
By:
County Manager
P.E., P.L.S.

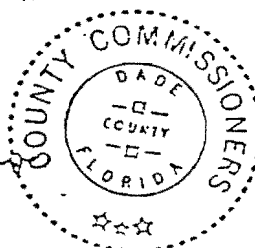

Joaquin G. Avino
Dade County

Date

12/27/93

Attest:





By: Deputy Clerk

Approved by County Attorney
as to form and legal sufficiency _____

PERMIT NO. 132410469

EXHIBIT A

Pursuant to facts and figures presented by representatives of Everglades National Park (the PARK) before the Special Areas Management Plan Committee (SAMP), the member agencies of the SAMP have agreed to transfer two thirds (2/3) of each per-acre mitigation contribution made to the Dade County Freshwater Wetlands Mitigation Trust Fund (FWMT Fund) for work in the Bird Drive Everglades Wetland Basin and the North Trail Wetland Basin, to the PARK, for the purposes of restoring, monitoring, studying and managing that area of the PARK known as the "Hole-in-the-Donut." The per-acre amount of revenue transferred to the PARK from the FWMT Fund, for work performed in the subject wetlands basins, shall not be less than that required to restore, monitor, study or manage an equal number of acres within "Hole-in-the-Donut." For the 1992-93 fiscal year, the cost of restoring, monitoring, studying and managing an acre of land in the "Hole-in-the-Donut" is \$16,500.

PERMIT NO. 132410449

PERMIT NO. 132416479

JUN 20 1994

EXHIBIT B

RESTORATION OF FORMER WETLANDS
WITHIN THE
HOLE-IN-THE-DONUT IN EVERGLADES
NATIONAL PARK

PROJECT PLAN AND SPECIFICATIONS

RESTORATION OF FORMER WETLANDS WITHIN THE
HOLE-IN-THE-DONUT IN EVERGLADES NATIONAL PARK¹

by

Robert F. Doren, Louis D. Whiteaker
Everglades National Park
P.O. Box 279, Homestead, Fl. 33030

George Molnar
Dade County Department of Environmental Resources Management
111 NW 1st Street
Miami, Fl. 33128

David Sylvia
University of Florida
2169 McCarty Hall
Gainesville, Fl. 32611

ABSTRACT

A major site of exotic plant invasion within Everglades National Park is an area of former mesic prairie wetlands now called the "Hole-in-the-Donut." This area (4000 hectares) was intensively farmed for several decades using only crude mechanical soil preparation methods. In the early 1950's the process of rock-plowing was developed which crushes the natural limestone rock, producing a substrate much better suited for crops than the existing substrate. This pedogenesis changed the area from primarily low nutrient, low oxygen (perhaps anaerobic in some circumstances) conditions to higher nutrient, higher oxygen conditions which have been tied to increased susceptibility to exotic invasion. Approximately half of the "Donut" was rock-plowed and, since acquisition by Everglades National Park, has become dominated by *Schinus terebinthifolius*. Various techniques (planting, mowing, burning, bulldozing, substrate removal, etc.) have been tried in an attempt to restore this area to wetlands. Of these methods, only substrate removal has been effective. The results of substrate removal are an increase in hydroperiod and mitigation of the conditions created by the disturbed substrate. These changes alter the secondary successional patterns in favor of natural revegetation. In order to evaluate this technique for possible use on all former wetlands in the Donut, a large scale test has been implemented utilizing an off-site mitigation program involving Everglades National Park, Dade County Department of Environmental Resources Management, and the U. S. Army Corps of Engineers. Substrate has been removed from 24.3 hectares within the Donut. Secondary succession, hydrological, microbiological and nutrient relationships are being monitored over the next several years. Preliminary results suggest that hydrological and pedological conditions are favoring succession toward native wetland vegetation.

¹ This publication should be cited as: Doren, R.F., L.D. Whiteaker, G. Molnar and D. Sylvia. Restoration of Former Wetlands within the Hole-in-the-Donut in Everglades National Park, in Webb, F.J., Jr., Ed. 1990. Proceedings of the Seventh Annual Conference on Wetlands Restoration and Creation. Hillsborough Community College, Tampa, Florida.

INTRODUCTION

JUN 20 1994

Exotic plants pose one of the greatest threats to the integrity of Everglades ecosystems. Over 220 species of introduced plants occur in Everglades National Park (Whiteaker and Doren 1989). One of the major areas of exotic plant invasion within the park is called the "Hole-in-the-Donut". This area includes approximately 4000 hectares of previously farmed land. Farming began in 1916 primarily using crude mechanical soil preparation and clearing. In 1934 Congress authorized the establishment of Everglades National Park but excluded this large area of privately owned agricultural land. In the early 1950's rock-plowing was developed. By crushing the natural limestone rock, rock-plowing produces a substrate much better suited for crops than the existing substrate (Ewel et al. 1982). This pedogenesis changed the area from primarily low nutrient, anaerobic conditions to higher nutrient, aerobic conditions which has been tied to increased susceptibility to exotics (Gerrish and Mueller-Dombois 1980, Bridgewater and Backshall 1981, Huenneke, et. al. 1990). Rock-plowing continued in the Donut through 1975 by which time approximately 2000 hectares of land had been rock-plowed. The remaining 2000 hectares of non rock-plowed land were variously abandoned from around 1930 through the early 1960's. The majority of non rock-plowed land has returned primarily to native vegetation, with only a small portion dominated by *Schinus* (Ewel et al. 1982). The oldest areas dominated by *Schinus* are about 35 years past abandonment (Figure 1). The 2000 hectares of rock-plowed land formerly consisted of approximately 1600 hectares of wetland prairies, 140 hectares of sawgrass glade, 40 hectares of ponds, 180 hectares of pineland, with the remainder in bayhead or hammocks (Krauss 1987). In 1975 the park acquired the remainder of the Hole-in-the-Donut, and farming ceased with this acquisition.

Once farming was discontinued, the Park Service perceived a dual problem of re-establishing native vegetation and preventing invasion of exotic species, particularly *Schinus*. Virtually no information was available regarding the successional trends of abandoned rock-plowed farm land in southern Florida (Alexander 1973). Several attempts to quantitatively and qualitatively define and describe old field succession were made. Regional studies on the processes and stages of old-field succession have been detailed by Oosting (1942), Keever (1950), McCormick and Buehl (1957), Odum (1960), and Egler (1952). Robertson (1953, 1955), Hilsenbeck (1976), and Alexander (1972) attempted to quantify succession and early seral stages. Loope and Dunevitz (1981), Ewel et al. (1982), Krauss (1987), and Doren and Whiteaker (1990a) quantitatively examined the patterns of old field succession occurring in the park. Loope and Dunevitz (1981) determined that the *Schinus* was increasing by as much as twenty times its population density per year. Doren and Whiteaker (1990a) found that *Schinus* invasion proceeds from low densities in a mosaic of herbaceous vegetation (five to ten years since abandonment) through extremely high densities (ten to twenty years since abandonment) to a self-sustaining stand with somewhat reduced density but with many very large trees (>20 years since abandonment). Krauss (1987) and Ewel et al. (1982) were unable to relate successional patterns or apparent final stages to farming history, hydrological differences, or substrate variations, but concluded that the successional forests dominated by *Schinus* are maintaining themselves. They also concluded that proximity to seed source, seed rain intensity, and local distribution were primary causes for the expansion of *Schinus* in and around the Donut. Doren and Whiteaker (1990b) determined that fire does not exclude the establishment of *Schinus* and other hardwoods, nor does it promote the establishment or expansion of paragrass (*Brachiaria mutica*), or other grasses, in the Hole-in-the-Donut. Previous work by Allen (1936), Egler (1942), Myers (1983), Ewel (1986), Smith (1985), Harper (1965), Crawley (1987), Sukop and Trepl (1987) and Vitousek and Walker (1989), has shown that perturbation favors the colonization of weedy, principally exotic species, and the elimination or mitigation of the disturbance does not. Further, review of unpublished records pertaining to

PERMIT NO. 132410469

attempts to restore the Donut included various projects such as: 1) planting pine seedlings and saplings; 2) seeding with pine and several species of hardwoods and grasses; 3) transplanting native grasses and sedges; 3) mowing; 4) discing; 4) burning; 5) bulldozing and other forms of mechanical removal of *Schinus*; 6) removal of substrate in a former slough to reestablish hydrological flow; 7) planting hardwood saplings; and 8) chemical control of *Schinus*. Only two of the projects, the substrate removal in the former slough and a portion of the bulldozed site, resulted in the recolonization of previously rock-plowed sites by native vegetation to the exclusion of *Schinus*. While constant mowing or discing prevent *Schinus* invasion, the cost of such a program is prohibitive, and once stopped succession again proceeds to *Schinus*. The net result of the two substrate removal project was the elimination of the effects of the disturbed substrate and subsequent increase in hydroperiod. Both disturbance and shortened hydroperiod have been directly related to changes in secondary successional patterns and exotic invasion by Bridgewater and Backshall (1981), Allen (1936), Egler (1942), Myers (1983), Ewel (1986), Smith (1985), Harper (1965), Crawley (1987), Sukop and Trepl (1987), and others. Additional examples of the effectiveness of substrate removal are demonstrated in several sites in the East Everglades Management Area, where Dade County Department of Environmental Resources Management has required the removal of substrate disturbed by illegal rock-plowing or filling as mitigation for permit violations (Dalrymple 1989).

The project presented here was proposed to systematically examine the results of the removal of rock-plowed substrate as a rehabilitation tool for abandoned farmlands dominated by *Schinus* forest in the Hole-in-the-Donut. The project has the following objectives:

1. Determine the effects of partial and total removal of disturbed substrate in former wetlands on vegetation composition, especially recolonization by *Schinus* and other exotics.
2. Determine the effects of increased hydroperiod due to the lowering of surface elevation on vegetation composition, especially recolonization by *Schinus* and other exotics.
3. Evaluate the synergistic effects of partial and total removal of disturbed substrate and increased hydroperiod on vegetation composition, especially recolonization by *Schinus* and other exotics.
4. Determine the changes in vesicular-arbuscular mycorrhizae fungi associations and their possible effect on plant succession as a result of the removal of disturbed substrate and an increase in hydroperiod.
5. Determine the changes in soil nutrient levels as a result of removal of disturbed substrate, standing vegetation, and increased hydroperiod.

STUDY AREA

The study area is located in the extreme southern everglades in Everglades National Park, Ranges 36 and 37 East, Township 58 South, in Dade County, Florida (Fig. 2). The natural features and vegetation of the area have been described by Davis (1943), Egler (1952), Robertson (1955), Craighead (1971), Alexander and Crook (1973), Hilsenbeck (1976), Wade et al. (1980), and Krauss (1987). Soils were mapped and described by the USDA (1958). The study site is within the Hole-in-the-Donut (Fig. 3, item # 1). Post farming successional vegetation associations have been described by Ewel et al. (1982), Krauss (1987), and Doren and Whiteaker (1990a). The site is

JUN 201

located 335.4m $\pm$ north of the southeast corner of Section 36, Township 58S, Range 36E (Fig. 3). The site extends approximately 570m along the road, and approximately 426.8m perpendicular to the road, and is a total of 24.3 ha. It is subdivided into two sections so as to allow partial removal of the disturbed substrate on the southern most 6.1 ha. Disturbed substrate was removed to the level of undisturbed substrate on the remaining 18.2 ha.

MATERIALS AND METHODS

This study involved the removal of exotic dominated vegetation cover (*Schinus terebinthifolius*) and the disturbed, previously farmed, substrate on 24.3 ha of the Donut. Removal was down to limestone bedrock on 18.2 ha (completely mitigated site), and on 6.1 ha (partially mitigated site) approximately one half of the disturbed substrate was removed. We proposed the study in order to evaluate the use of substrate removal as a means of restoring former wetlands. The two different removal strategies were developed in order to further evaluate the relative effects of soil removal and increased hydroperiod on effectiveness of restoration, and the prevention of *Schinus* reinvasion.

Substrate Removal and Surveying

Prior to vegetation or substrate removal, survey lines were cleared by bulldozer (model D8). Elevation sightings were taken at the edge of the cleared survey lines (outside of the disturbance created by the bulldozer) in order to provide a topographic map prior to soil removal. A 15.24cm (6") contour map was produced from the initial survey. Elevations were determined to ± 0.3 cm (0.01 ft) National Geodetic Vertical Datum, 1929 (NGVD29). After this elevation survey, the vegetation was cleared and piled, allowed to dry, and burned. Soil depths were systematically taken on the 6.1 ha portion of the site. Three depth measurements were taken at each location using a standard soil probe.

Substrate removal began after the vegetation was burned. Substrate removal consisted of bulldozing the substrate into windrows, loading the substrate into dump trucks and hauling the substrate to a previously approved site outside the park for disposal.

After substrate removal, another topographic survey was completed and a six inch contour map was created.

Topography and control sheets were produced from a black and white aerial image taken of the site after substrate removal. The control sheets identify the location of all vegetation plots, seed traps, hydrological wells, site corners with UTM locations, location of bench mark, and topographic survey.

PERMIT NO. 132416479

Data Sampling

Vegetation Sampling

Sixty-three vegetation sample plots were systematically placed in a grid pattern throughout the site. 49 plots on the completely mitigated 18.2 ha site and 14 on the partially mitigated 6.1 ha site. Each plot is 100 m² (10 m X 10 m) in size. Each vegetation plot was placed at an intersection of a 60.75 m² (200 ft²) grid previously surveyed on the site. All vegetation plots are permanently tagged and numbered, and marked at the four corners with 1.27 cm (0.5") rebar. Vegetation is sampled in six layers (1 = submersed, 2 = liana, 3 = 0 - 1m, 4 = >1m < 2m, 5 = >2m < 5m, 6 = >5m), and by life-form (herb, shrub, tree, liana). Occurrence of each species within each plot is evaluated by layer using the Braun-Blanquet cover-abundance scale (1 = numerous but with < 5% cover; 2 = any number with 5 - 25% cover; 3 = any number with 25 - 50% cover; 4 = any number with 50 - 75% cover; 5 = any number with > 75% cover; 8 = few with < 5% cover; 9 = solitary with < 5% cover) (Mueller-Dombois and Ellenberg 1974). Federal wetland category is determined for each species. A complete species list is determined for the site at each sampling interval (including species not found within the designated sampling plots. Vegetation data are collected every six months.

One square meter (1m²) subplots are located in the southeastern corner of each plot. *Schinus* seedlings are counted in each subplot.

In order to estimate the amount and pattern of incoming *Schinus* seeds onto the site, 0.5 m² seed traps were placed adjacent to each vegetation plot. Nine additional seed traps were placed at systematic intervals near the edges of the mitigation site, and nine were similarly placed within the surrounding *Schinus* forest. Seed traps are sampled monthly. Seeds collected in the seed traps are tested for viability by germination under mist, in a greenhouse. Germination is defined as the emergence of the cotyledons.

Total potential for *Schinus* seed germination from the existing substrate seed bank were estimated using substrate samples and allowing for germination. Samples were randomly located and will consist of 10 1m² samples of soil removed to bedrock.

Hydrological Sampling

Hydrological wells were drilled adjacent to each vegetation plot. Each well has an "effective" minimum of 1m deep. Each well was drilled using a standard well drilling rig with a 6 inch (15.24 cm) bit, and cleaned of rubble using the blow-out method - where compressed air is forced down the bottom of each well as drilling proceeds. Each well is then lined with 2 inch (5cm) PVC pipe which is surrounded by pea gravel and capped at ground level with concrete. The top of each well pipe is surveyed to ± 0.3 cm NGVD29. Water levels are measured manually every two weeks using an engineers tape measure.

A continuous water level recorder was placed in an additional well located near the center of the site. This well was drilled using the same drilling rig and clean-out method but used an 18 inch (45.7 cm) drilling bit. The finished well is 12 inch (30.5 cm) wide, has an "effective" minimum depth of 6m, and is lined and finished in the same manner as the other wells. Mean water level is automatically recorded to NGVD29 every hour using a potentiometric data logger.

Substrate Nutrient Sampling

PERMIT NC. 132415479

Twenty substrate samples (approximately one per 1.25 hectares) were systematically taken, using a grid pattern covering the entire site, before substrate removal. Twenty additional samples were taken 2 years after the initial mitigation.

The analysis parameters include: pH, conductivity, ammoniacal nitrogen (ug/g - NH_4), nitrate nitrogen (ug/g - NO_3), total nitrogen (mg/g - Kjeldahl N), total phosphorus (ug/g - Total PO_4), chlorides (ug/g - Cl), total organic matter (%TOM), Aluminum (%Al), Iron (%Fe), Potassium (%K), Magnesium (%Mg), Copper (ppm Cu), Manganese (ppm Mn), and Zinc (ppm Zn). JUN 20 10

Vesicular-Arbuscular Mycorrhizae (VAM) Fungi Sampling

A. Initial Documentation of Host Plant Colonization and Predominate VAM Fungi:

1. Adjacent *Schinus* forest:

The distribution of VAM Fungi and the intensity of VAM fungus colonization of roots in an adjacent site, comparable to the mitigation site, were determined. Twenty-five cores (ca. 15 cm diameter and 20 cm deep) were taken randomly at the site. Roots were washed free of soil. Fine roots (<2mm) were cleared in 10% KOH, stained with 0.05% trypan blue, and percentage of fine root length colonized by VAM fungi were estimated by a gridline-intersect technique. Spores were separated from the soil by wet-sieving and decanting, followed by centrifugation in water and 40% sucrose. Spores were quantified and identified to genus and, where possible from field-collected material, to species. A subsample from each core were mixed into a composite sample from the site for determination of the inoculum potential of VAM fungi, using the Most Probable Number (MPN) method.

2. Partial and full mitigation sites:

Following mitigation and permanent location of vegetation study plots, an assessment were made of the VAM status of the partial and full mitigation areas. Cores were collected adjacent to every other vegetation plot, giving a total of 32 samples. Distribution of spores were determined as noted in A.1. above. For determination of inoculum density, subsamples from cores were mixed to provide material for three and six MPN assays for the partial and full mitigation sites, respectively.

B. Determination of the VAM Status of Recolonizing Plant Species:

1. Root colonization of recolonizing plants:

Approximately 12 and 18 months after mitigation, representative fine root samples were collected from plants growing adjacent to the 63 vegetation monitoring plots. Root samples were processed as noted in A.1. above.

2. Monitoring inoculum potential and predominant VAM species:

Approximately 12 and 18 months after mitigation, cores were collected adjacent to every other vegetation monitoring plot. Spore populations and inoculum potential were determined as noted in A.1. above.

PERMIT NO. 132410479

C. Determination of the VAM Status of Abundant Native Wetland Prairie Vegetation in Undisturbed Natural Communities.

1. Root colonization of native wetland species:

Representative fine root sample of *Cladium jamaicense*, *Muhlenbergia capillaris*, *Eleocharis cellulosa*, *Rhynchospora tracyi*, and *Pluchea rosea* were collected randomly from an area of undisturbed prairie.

2. Monitoring inoculum potential and predominant VAM species:

Cores were collected randomly from an area of undisturbed prairie. Spore populations and inoculum potential was determined as noted in A. 1. above.

Data Analysis

Vegetation Data

The synthesis table technique (Mueller-Dombois and Ellenberg 1974, Gauch 1982) were used to arrange the sample plots in a sequence that brings together plots similar in species composition and to arrange species in a sequence relating to their distributions among samples. Sample plot vegetation data were input into a species/sample plot matrix for use with the COENOS (IBM PC compatible) microcomputer program (Ceska and Roemer 1971).

The data will also be analyzed using the dendrogram technique (Mueller-Dombois 1974). A dendrogram was produced to display the mutual relationships among sample plots. Data were input into a matrix for use with the MVSP (IBM PC compatible) microcomputer program (Kovach 1986).

Comparisons of the number of species were made by their Federal wetland categories to evaluate the numbers of species recolonizing the site and their relative habitat designation.

Seed trap data was used to calculate mean seed rain and standard deviation per m² per month. These calculated values will also be used to describe the variability of seed rain relative to time of year and distance from nearest seed source. Correlations between distance from seed source (and if possible, method of dispersal by bird, mammal, or wind/water) and occurrence of *Schinus* within the vegetation plots was determined.

Percent seed viability of the *Schinus* seed collected was determined using the germination results.

Hydrological Data

Water levels were determined to NGVD29. They were compared to the site topography to determine depth, total area inundated, and period of inundation by month. Water levels from the manual wells were correlated to the continuous reading well in order to determine hydrological conditions over the entire site using only the continuous well. These data were compared with the topographic map and were correlated with vegetation colonization. Data were entered into a GIS using the GRASS III program for geographic analysis.

VAM Fungi Data

JUN 20

The VAM study is being conducted to determine if there is a relationship between successional trends on the various sites and VAM fungi species that colonize these sites in unmitigated areas of the Hole-in-the-Donut, mitigated sites and natural prairie areas. The data collected here were used to establish any VAM fungi - macrophyte species affinities and habitat preferences. Correlations of the occurrence of different VAM fungi species by site (disturbed substrate/*Schinus* dominated forest; mitigated sites; undisturbed native prairie) were determined. These results were instrumental in developing a method, through inoculation of sites, for encouraging more favorable and rapid recolonization by desirable wetland species on mitigated sites.

RESULTS

Substrate Removal and Surveying

Substrate scraping and removal was completed between January 23 and June 13, 1989. A total of 3,437 dump truck loads, or approximately 68,740 cubic meters of rock-plowed substrate, was removed from the site. The number of truck loads removed per work day ranged from 7 to 166 loads per day. The number of trucks working on days that substrate was hauled ranged between 1 and 14 trucks.

Exotic vegetation and rock-plowed substrate was removed from a 24.3 ha area that is 569 meters by 427 meters. Disturbed substrate was removed down to undisturbed substrate (limestone base) on 18.2 ha of the site that is 427 m². Substrate was partially removed from a 6.1 ha site that is 427 meters by 142 meters. Vegetation and substrate were also removed from a 30.5 meters wide "buffer zone" along three sides of the site.

Aerial photography of the site was taken in September, 1989 and adjusted to a scale of 1 inch = 50 feet (2.54cm = 15.2 m) based on targets placed at known points. A topographic map with 6 inch contours was produced at this same scale to overlay the aerial photography. Elevations on the site ranged from -0.9 meters (-3) NGVD29 to +1.1 meters (3.6) NGVD29.

Data Sampling

Vegetation Sampling

The vegetation of the site has been sampled twice from each of the 63 permanently marked vegetation plots. The initial sample was taken in August, 1989 and the second sample was taken in February, 1990. The data from the initial sampling has not yet been analyzed with community analysis methods. However, these data resulted in a list of 101 species that were classified into Federal wetland habitat categories. Eleven percent are obligate wetland species, 39% are facultative wetland species, 2% are submerged species, 29% are facultative upland species, and 20% are upland species. Thus, a total of 54% of the plants listed from the site are wetland species.

Six of the 63 one meter square seedling subplots contained *Schinus* seedlings in August, 1989. Only two of these subplots were in the area where the rock-plowed substrate was completely removed, and four of the subplots were in the partially removed area. In the partially removed section the calculated *Schinus* seedling density is 0.93/m², while in the complete substrate removal area the calculated *Schinus* seedling density is 0.08/m².

PERMIT NO. 182410-69

No seed traps contained seeds in September, 1989, two traps contained two seeds each in October, 1989, ten traps contained from three to 37 seeds in November, 1989, and twelve traps contained from two to 149 seeds in December, 1989. Of the seed traps that contained seeds, both were under the *Schinus* canopy in October, eight of the 10 traps were under the canopy in November, and nine of the 12 were under the canopy in December. Therefore, only five seeds traps outside the *Schinus* canopy contained seeds for the period for which the data has been tabulated. These five traps contained from two to 21 seeds each. The traps under the *Schinus* canopy contained from two to 149 seeds each during this same period, and ranged from 17 to 149 seeds per trap in December.

DISCUSSION

This project was implemented as off-site mitigation for a private wetland development in Dade County. Total project costs of \$640,000.00 were borne entirely by the private developer. Everglades National Park, the U.S. Army Corps of Engineers and the Dade County Department of Environmental Resources Management (DERM) worked cooperatively to develop this project. This cooperative effort was needed to ensure that it would meet the compensatory mitigation needs mandated under Federal, State and local regulations, as well as the National Park's needs to design a management tool for rehabilitating the Hole-in-the-Donut area.

Dade County DERM has had a long standing interest in promoting the development of a practical methods for wetland mitigation that could be applied to certain wetland dredge and fill projects requiring regulatory permits. The project represents a pilot attempt to accomplish such off-site mitigation. If project goals are met, Everglades National Park will consider whether to establish a large-scale funding source for off-site mitigation in the Hole-in-the-Donut. Under this concept, a General Permit mechanism would be approved to allow individual developers within a defined, highly-stressed wetland area of Dade County, to meet mitigation obligations under Federal, State and local regulations, by paying into a fund at a unit cost per acre of wetland impacted. Costs per acre would be based on mitigation ratios established under the General Permit by the regulatory agencies and the Park. It is anticipated that a mitigation rate of \$15,000.00 per acre will be the minimum required. This process will hopefully provide sufficient resources to enable Everglades National Park to eventually rehabilitate the entire Hole-in-the-Donut.

Initial data suggest that the mitigation site is favorable for colonization by native wetland species, since 54 per cent of the species encountered in the initial monitoring have been classified as wetland species. These results also support the sequence of old field succession found by previous studies in the Hole-in-the-Donut (Loope and Dunevitz 1981, Ewel et al. 1982, Krauss 1987) where initial stages of this succession are dominated by weedy herbaceous wetland species (Figure 1). However, *Schinus* seedling colonization on the partially mitigated area is similar in density (0.93 seedlings/m²) to that found on abandoned rock-plowed sites that have succeeded to woody communities dominated by a *Schinus* canopy (0.9 seedlings/m²; Doren and Whiteaker 1990). In contrast, the fully scraped area has a substantially lower density of *Schinus* seedlings (0.08 seedlings/m²). This suggests that the partially scraped area is more likely to follow the successional sequence towards a *Schinus* dominated successional forest, and the fully scraped area is likely to follow the successional sequence towards a community dominated by native plants.

ACKNOWLEDGEMENTS

We thank the engineering contractor, CAS Engineering, Inc., for the work involved with the substrate removal, aerial photography, and topographic survey. We thank the biological consultant, Mark McMahon, for the data collection. We thank Patrick O. Keefe, Larry Bloomer and Klerin O'Malley for their activities in monitoring the engineering work. We thank Terressa Mussetto, Dade County Attorney, for her legal advise and support. We thank Everglades's contracting officer, Sherry Dague, for coordinating the cooperative agreement. We thank George Dalrymple for his time and unqualified support of this project and his excellent ecological advice. We thank The U.S. Army Corps of Engineers personnel, Chuck Schnepfel and Karen Kennedy; U.S. Fish and Wildlife personnel, Bob Turner, Joe Carroll and Dave Ferrel; Environmental Protection Agency personnel, Eric Hughes; and National Park Service SERO personnel, Dominic Dottavio and Trish Patterson, for their support of this project. And finally we thank Everglades National Park Superintendent Michael Finley and Assistant Superintendent Rob Amberger, without whose support this project could never have been implemented. UN 2 9

PERMIT NO

132416479

LITERATURE CITED

- Alexander T. R., and A. G. Crook. 1973. Recent and long-term vegetation changes and patterns in South Florida: Part I: Preliminary Report. South Florida Environmental Project. University of Miami, Coral Gables, Florida. 224 p. PB-231.939.
- Alexander T. R., and A. G. Crook. 1975. Recent and long-term vegetation changes and patterns in South Florida: Part II: Final Report. South Florida Ecological Study. University of Miami, Coral Gables, Florida. 827p.
- Allen, H. H. 1936. Indigine versus alien in the New Zealand plant world. Ecology 17: 187-193.
- Bridgewater, P. B., and D. J. Backshall. 1981. Dynamics of some Western Australian ligneous formations with special reference to the invasion of exotic species. Vegetatio 46: 141-148.
- Ceska, A. and H. Roemer. 1971. A computer program for identifying species-releve-groups in vegetation studies. Vegetatio 23: 255-277.
- Craighead, F. C., SR. 1971. The Trees of South Florida. University of Miami Press, Coral Gable, Florida. 212p.
- Crawley, M. J. 1987. What makes a community invasible? pp. 429-453, in A. J. Gray, M. S. Crawley, and P. J. Edwards (eds.), Colonization, Succession, and Stability. Blackwell Scientific Publications, Oxford.
- Dalrymple, G. H., 1989. Ecological study of wetland mitigations in Dade County, Florida. F.A.U. - F.I.U. Joint Center for Environmental and Urban Problems. Unpublished manuscript, copy at Everglades National Park, P.O. Box 279, Homestead, Florida 33030. 44p.
- Davis, J. H., JR. 1943. Vegetation of the Everglades and conservation from the point of view of the plant ecologist. Proc. Soil Sci. Soc. Fla. 5A: 104-115.
- Mueller-Dombois, D. and H. Ellenberg. Aims and Methods of Vegetation Ecology. John Wiley and Sons. New York, New York. 547p.
- Doren, R. F. and L. D. Whiteaker. 1990a. Comparison of economic feasibility of chemical control strategies on differing age and density classes of *Schinus terebinthifolius*. Natural Areas Journal 10(1) 28-34.
- Doren, R. F., L. D. Whiteaker and A. M. LaRosa. 1990b. Evaluation of Fire as a management tool for controlling *Schinus terebinthifolius* as secondary successional growth on abandoned agricultural land. Environmental Management 14(6) in press.
- Egler, F. E. 1942. Indigine versus alien in the development of arid Hawaiian vegetation. Ecology 23: 14-23.
- Egler, F. E. 1952. Southeast saline Everglades vegetation, Florida, and its management. Vegetatio 3: 213-265.

JUN 20 1994

- Ewel, J. J., D. S. Ojima, D. A. Karl, and W. F. DeBusk. 1982. *Schinus* in successional ecosystems of Everglades National Park. South Florida Research Center Report T-676. 141 pp.
- Ewel, J. J. 1986. Invasibility: lessons from South Florida. pp. 214-230 in H. A. Mooney and J. Drake (eds.), Ecology of Biological Invasions of North America and Hawaii. Springer-Verlag, New York.
- Florida Department of Transportation. 1986. Standard Specifications for Road Bridge Construction. Edition of 1986. Florida D.O.T., Tallahassee.
- Freese, F. 1962. Elementary Forest Sampling. Agriculture Handbook No. 232. U.S. Department of Agriculture, Forest Service.
- Gauch, H. G. 1982. Multivariate Analysis in Community Ecology. Cambridge University Press, New York.
- Gerrish, G., and D. Mueller-Dombois. 1980. Behavior of native and non-native plants in two tropical rainforests on Oahu, Hawaiian Islands. *Phytocoenologia* 8: 237-295.
- Green, R. H. 1979. Sampling Design and Statistical Methods for Environmental Biologists. John Wiley and Sons, New York.
- Greig-Smith, P. 1983. Quantitative Plant Ecology (Studies in Ecology, Volume 9). University of California Press, Berkeley.
- Harper, J. L. 1965. Establishment, aggression and cohabitation in weedy species. pp. 243-265. in H. G. Baker and G. L. Stebbins (eds.), The Genetics of Colonizing Species. Academic Press, New York.
- Hilsenbeck, C. E. 1976. An investigation of old field succession in Everglades National Park, 1st Interim Report. Everglades National Park. 63 pp.
- Huenneke, L. F., S. P. Hamburg, R. Kolde, H. A. Mooney, and P. M. Vitousek. 1990. *Ecology* 71(2): 478-491.
- Keever, P. 1950. Causes of succession on old fields of the Piedmont, North Carolina. *Ecological Monographs* 20: 229-250.
- Kovach, W. L. 1986. A Multivariate Statistics Package for the IBM PC and Compatibles. Indiana University, Bloomington.
- Krauss, P. 1987. Old Field Succession in Everglades National Park. South Florida Research Center Report, SFRC-87/03. 75 pp.
- Little, E. L., JR. 1978. Atlas of United States Trees, Vol. 5. Florida. U.S. Department of Agriculture, Forest Service, Misc. Publ. No. 1361. 256 + maps.
- Long, R. W. 1974. Vegetation of southern Florida. *Florida Scientist* 37: 33-45.

PERMIT NO. 132410169

- Long, R. W., and O. Lakea. 1971. A Flora of Tropical Florida. A Manual of the Seed Plants and Ferns of Southern Peninsular Florida. University of Miami Press, Coral Gables, Florida. 962 pp.
- Loope, L. L., and G. N. Avery. 1979. A preliminary report on rare plant species in the flora of National Park Service areas of South Florida. South Florida Research Center Report M-548. 42 pp.
- Loope, L. L., and V. L. Dunevitz. 1981. Investigations of early plant succession on abandoned farmland in Everglades National Park. South Florida Research Center Report T-644. 65 pp.
- Marriot, F. H. C. 1974. The Interpretation of Multiple Observations. Academic Press Inc., New York.
- McCormick, J., and M. F. Buell. 1957. Natural revegetation of a plowed field in the New Jersey Pine Barrens. *Botan. Gaz.* 118: 261-264.
- Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and Methods of Vegetation Ecology. John Wiley and Sons, New York.
- Myers, R. L. 1983. Site susceptibility to invasion by the exotic tree *Melaleuca quinquenervia* in southern Florida. *Journal of Applied Ecology* 20: 645-658.
- Myers, W. L. and R. L. Shelton. 1980. Survey Methods for Ecosystem Management. John Wiley and Sons, New York.
- Odum, E. P. 1960. Organic production and turnover in old field successions. *Ecology* 41: 34-49.
- Oosting, H. J. 1942. An ecological analysis of the plant communities of Piedmont, North Carolina. *American Midland Naturalist* 28: 1-126.
- Porter, C. L., Jr. 1967. Composition and Productivity of a Subtropical Prairie. *Ecology* 48, No. 6: 937-942.
- Robertson, W. B., JR. 1953. A survey of the effects of fire in Everglades National Park. Mimeo Report. 169 pp.
- Robertson, W. B., JR. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Dissertation. University of Illinois. 599 pp.
- Small, J. K. 1904. Report upon further exploration of southern Florida. *Jour. N.Y. Bot. Gard.* 5: 157-164.
- Small, J. K. 1929. From Eden to Sahara: Florida's Tragedy. Science Press Printing Co., Lancaster, Pa. 123 pp.
- Smith, C.W. 1985. Impact of alien plants on Hawaii's native biota. pp. 180-250 in C. P. Stone and J. M. Scott (eds.), Hawaii's Terrestrial Ecosystems: Preservation and Management. Cooperative National Park Resources Study Unit, University of Hawaii, Honolulu.

JUN 20 199

- Sokal, R. R. and F. J. Rohlf. 1969. Biometry: The Principles and Practice of Statistics in Biological Research. W. H. Freeman and Co., San Francisco.
- Sukopp, H., and L. Trepl. 1987. Extinction and naturalization of plant species as related to ecosystem structure and function. pp. 245-276. in E. D. Schulze and H. Zolfer (eds.), Potentials and Limitations of Ecosystem Analysis. Springer-Verlag, Berlin.
- Tomlinson, P. B. 1980. The Biology of Trees Native to Tropical Florida. Harvard University Printing Office, Allston, MA. 480 pp.
- USDA. 1958. Soil survey of Dade County, Florida. Series 1147, No. 4. Soil Conservation Service and the University of Florida Agricultural Experiment Station.
- Vitousek, P.M. and L.R. Walker. 1989. Biological invasion by *Myrica faya* in Hawaii: plant demography, nitrogen fixation, ecosystem effects. *Ecological Monographs* 50(3):247-254.
- Wade, D., J. Ewel, and R. Hofstetter. 1980. Fire in South Florida Ecosystems. U.S. Department of Agriculture, Forest Service. General Technical Report SE-17. Southeast Forest Experiment Station. Asheville, North Carolina. 125 pp.
- Whiteaker, L. and R. F. Doren. 1989. Exotic Plant Species Management Strategies and List of Exotic Species in Prioritized Categories for Everglades National Park. U. S. Department of the Interior, National Park Service, Research/Resources Management Report SER-89/04. Southeast Regional Office, Atlanta, Georgia 30303. 21 pp.

PERMIT NC. 132416479

Table 1. Partial listing of species colonizing the mitigation site in the Hole-in-the-Donut.

Aeschynomene spp.
Ammania coccinea
Ammania latifolia
Andropogon glomeratus
Aster subulatus
Boehmeria cylindrica
Caperonia palustris
Conoclinium coelestinum
Cyperus brevifolius
Cyperus distinctus
Cyperus odoratus
Cyperus polystachyos
Cyperus surinamensis
Dichromena colorata
Diodia virginica
Erigeron quercifolius
Eupatorium leptophyllum
Chloris glauca
Ludwigia microcarpa
Ludwigia octovalvis
Lythrum alatum
Mikania scandens
Cynoctonum petiolata
Myrica cerifera
Phyla nodiflora
Pluchea odorata
Salix caroliniana
Senecio glabellus
Solidago stricta
Typha spp.
Sagittaria spp.
Carex spp.
Rhynchospora spp.
Najas spp.
Pontederia cordata
Cladium jamaicensis
Schoenus nigricans
Eleocharis spp.
Alettris farinosa
Muhlenbergia capillaris
Schizachyrium spp.
Flaveria spp.

Periphyton

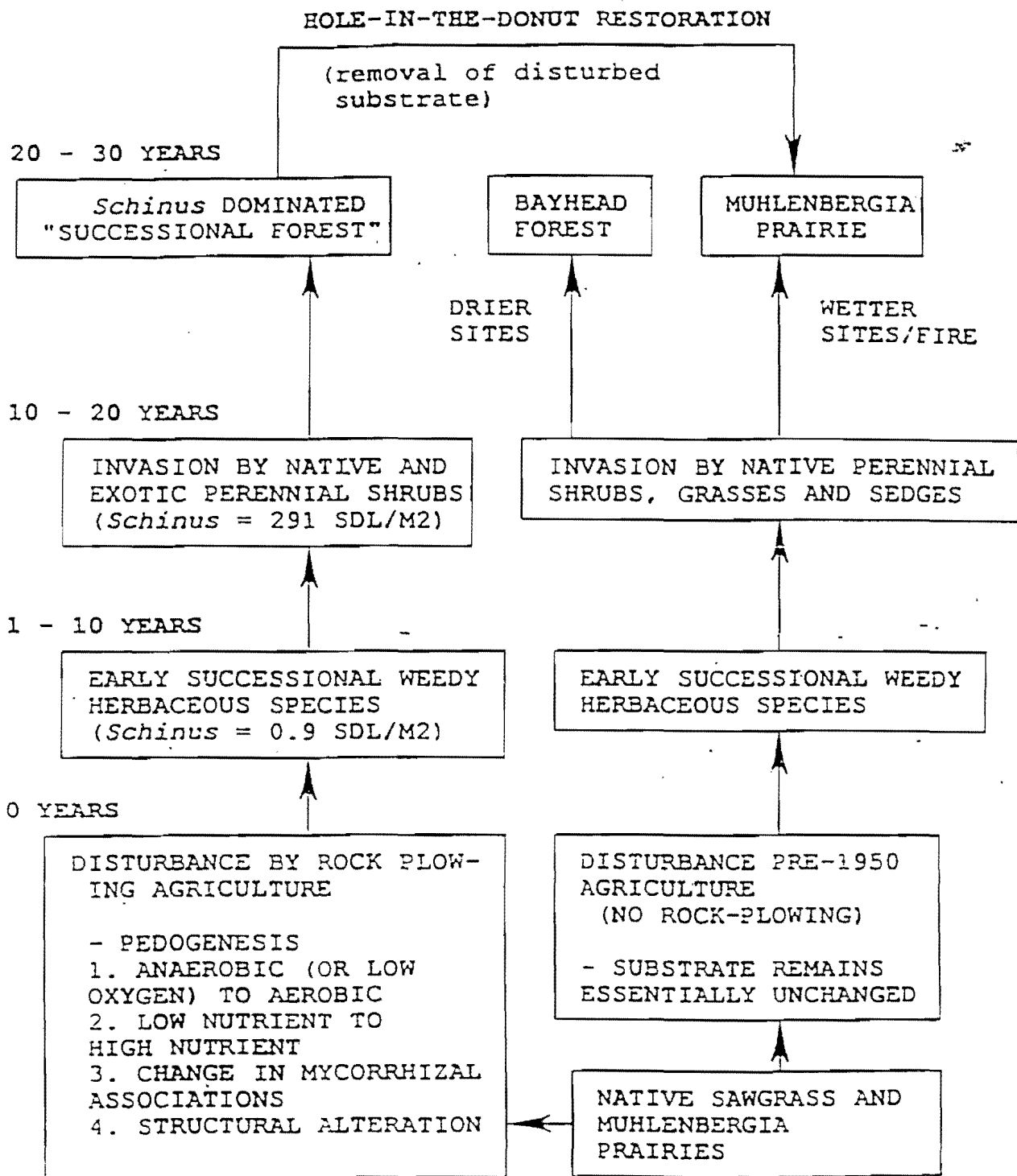
PERMIT NO. 132410419

JUN 20 1994

Figure 1. Flow chart showing general pattern of succession on farmland abandoned without the effects of rock-plowing and with the effects of rock-plowing.

PERMIT NC. 132410479

OLD FIELD SUCCESSION IN THE HOLE-IN-THE-DONUT



PERMIT NO. 132416479

Sources: Loope and Dunneville 1981, Krauss 1987, Doren & Whitaker 1990.

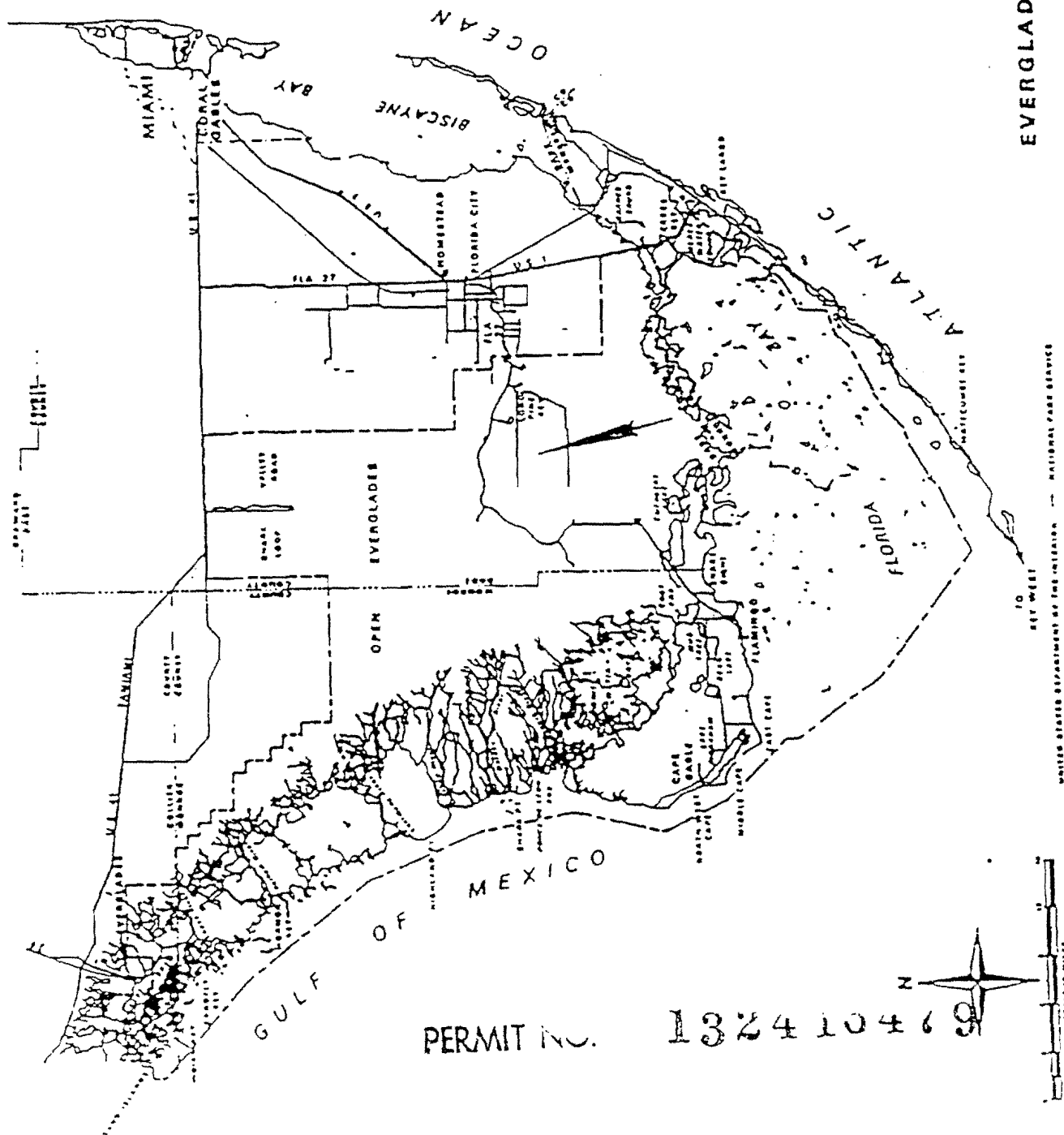
DBS 0028248

JUN 4 0 1994

Figure 2. Map of southern Florida and Everglades National Park, indicating the area of the Hole-in-the-Donut.

PERMIT NO. 132410469

EVERGLADES NATIONAL PARK
FLORIDA

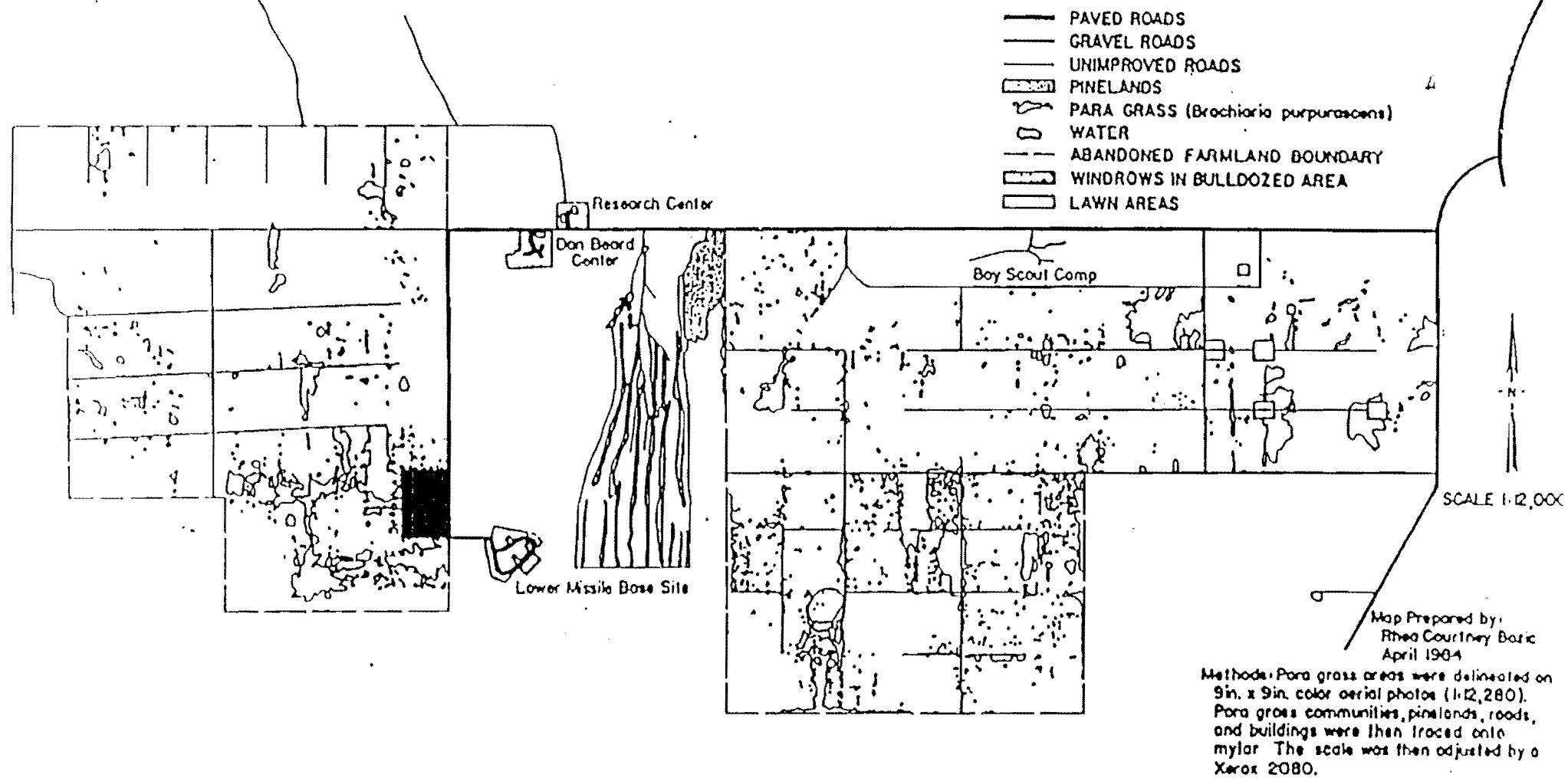


JUN 20 1994

Figure 3. Map of the Hole-in-the-Donut showing the location of the mitigation site.

PERMIT NO. 132410469

PARA GRASS AREAS IN THE HOLE-IN-THE-DONUT,
1980 EVERGLADES NATIONAL PARK



PERMIT NO. 192416479

065 0028252

ENGINEERING SPECIFICATIONS

JUN 26 1994

A. Topography and Control Sheets

Soil depths are to be taken on a 100 X 100 foot grid on each site. Three depth measurements shall be taken at each sample site before vegetation and soil removal, using a standard soil depth probe.

A Topography and Control Sheet shall be done after substrate removal and final grading are completed in order to provide before and after substrate contours and profile. The control sheet will have three inch (3") contour lines plotted on black and white aerial photography using a scale of one inch equals one hundred feet (1 inch = 100 feet). The contour map shall be produced using a minimum 10 foot control grid. Additional elevation 'shots' are to be taken within each 10 X 10 foot grid to capture all elevation changes ≥ 3 inches for individual topographic features greater than 3 ft² in extent. All topographic features smaller than 3 ft² in extent do not have to be included in the elevation survey. The Topography and Control Sheet will be a reproducible negative, and five blackline copies of the sheet will be provided in 'D' size format. An additional 'E' size format will be provided for all sites where 'D' size format will not encompass the entire site at the indicated scale.

A separate registered overlay of the survey grid with all elevations at all surveyed points is to be provided at the same scale as the topography and control sheet. All surveys are to be performed and certified in writing by a surveyor licensed and insured in the State of Florida. All survey points are to be accurate ± 0.1 feet (± 0.3 cm) NGVD29. Proof of State licensing and insurance shall be provided with bid package.

The following control items are to be represented on all Topography and Control Sheets:

- North Arrow
- Scale Bar (Scale ratios are NOT acceptable)
- UTM location for all photographic targets
- Survey grid; surveyed locations of all study plots, wells, equipment; survey corners of entire site, or other important features as determined by EVER
- Bench mark and UTM location and elevation for bench mark

In addition to hard-copy maps all geographic data are to be provided in digital format compatible with park GIS hardware and software configurations. Specifications for GIS compatibility are available from the Computer Sciences section at the Center for Everglades Restoration, Everglades National Park.

B. Aerial Photography for Production of the Topography and Control Sheets

All aerial photographs are to be black and white. All aerial photographs are to be taken AFTER substrate removal. Flight height above the ground will be such that the negatives will have an average scale of one (1) inch equals one-hundred (100) feet. Negatives having a departure from the specified scale by more than 5% because of tilt or abrupt changes in flying altitude must be corrected. Ground control targets are to be set out within each site. A minimum of 5 targets are to be placed within each site, or if a site requires more than one photographic image to capture the entire area, then 5 targets are to be placed within each photographic frame. The targets are to be placed such that there is one at approximately each corner of the site (or frame) and one in

PERMIT NO.

132410479

the approximate middle of the site (or frame). The targets will be a minimum of one meter square (1 m^2) with distinct alternate black and white checkerboard pattern. Each black area will be 0.5 m^2 alternating with each white area of the same size. The coordinates of each target center will be determined to within ± 0.25 meter accuracy using a Geographic Positioning System. The final coordinates will be noted on the Topography and Control Sheets in Universal Transverse Meridian (UTM). Should the 'site' require more than one photographic image, then end lap will be sufficient to provide full stereoscopic coverage of the area. End lap shall average 63%, plus or minus 5%. End lap of less than 58% or more than 68% in one or more negatives will be cause for rejection of such negatives. Negatives shall be made with the optical axis of the aerial camera in the vertical position. Tilt of any negative by more than three degrees, an average tilt of more than one degree for the entire project, or tilt between any two successive negatives exceeding four degrees may be cause for rejection. Crab in excess of three degrees may be cause for rejection. The photographs and resulting Topography and Control Sheets, will be clear and sharp in detail and of average uniform density. They shall be free from all clouds, cloud shadows, light streaks, static marks or other blemishes. All photography shall be taken at such time as to ensure a minimum solar angle of 30 degrees. The photographs shall be exposed using a distortion free 6 inch focal-length precision aerial mapping camera. A precision camera calibration report from the National Bureau of Standards shall be included in the bid proposal, for the camera to be used. If more than one image is required for the 'site' a photo index will be prepared by directly photographing on safety base film, at a convenient scale, the assembly of contact from all indexed and evaluated prints used. Each photo index shall carry a suitable title, scale bar and north arrow.

C. Bench Mark

A permanent bench mark, to U.S. Geological Survey or Army Corps of Engineers standards is to be established in the vicinity of the mitigation site (it shall be included within the aerial photographic coverage of the site, and shall be clearly marked on the photographs). The bench mark is to be constructed of concrete poured into a 12 inch diameter section of PVC pipe. It shall be extend into the ground at least 24 inches. It shall have a brass control plate firmly imbedded in the concrete. The top of the monument shall extend no more than three inches (3") above ground, but shall not be below the surface level of the ground. The elevation (accurate to within ± 0.01 feet; ± 0.03 cm), and the coordinates (accurate to within ± 0.25 meters using a GPS) shall be stamped into the brass control plate. All topographic surveys on the site shall be made using the benchmark established for that site. The locations for existing triangulation stations within Everglades National Park will be provided as reference for initial survey points.

D. Vegetation Clearing

Vegetation clearing is to be done using chopping or slash producing equipment that reduces the vegetation to manageable slash. This may require several passes by such equipment. After sufficient time to dry, the slashed vegetation may be burned on site if the existing slash is determined to be too bulky to include with substrate removal. Mulching and removal of mulch may be considered as an option.

E. Substrate Removal

PERMIT NO. 132410469

JUN 20 1994

Once substrate removal begins a crew superintendent will be on site at all times work is in progress. All interactions with EVER personnel regarding substrate removal specifications and directions on the site will be with the crew superintendent and/or site engineer, or other appropriate representative of the contractor, only.

Substrate is to be cleared and grubbed using appropriate equipment, such as bulldozers (ex. D8, D9), front-end loaders and dump trucks for hauling. All substrate, rubble, rock, vegetation, etc. removed from the site is to be completely removed from the site and deposited at a location previously identified and designated as part of this project. A map indicating the dumping location will be provided to the Contractor. The areas shall be bladed to remove all windrows, rubble piles, hillocks, or other raised sites or coarse disturbance which may serve as locations for re-invasion of *Schinus*. In order to reduce final disturbance and ensure minimum remaining rubble, the final two passes with bulldozer used to remove the soil must be done using equipment fitted with double Grouser treads. The entire removal process, in order to achieve the objective of total substrate removal and surface rock clearing, may take as many as six to eight passes with bulldozers. The total number of passes needed will be determined based on review of results by EVER personnel. Substrate that may be compacted by dump trucks during the removal of substrate windrows must be rescraped and removed as well. Resultant rock and rubble from fine grading is to be disposed of as all other substrate, rock, vegetation, rubble, etc.. All soil pockets, depressions, holes, or other topographic features of the site that can be cleared using heavy equipment are to be cleaned of disturbed substrate to ensure that variations in natural rock surfaces and micro-topographic features are restored and not filled and leveled with the disturbed substrate.

After final substrate removal the entire area is to be compacted with a multiple rubber-tired traffic roller. The compacting shall consist of two passes of the roller in one direction and then two more passes perpendicular to the first. Compacting does not have to include holes or depressions difficult for the compactor to negotiate, but shall include all negotiable portions of the site and shallow hard-bottom depressions.

No portion of the final scraped site shall have an elevation greater than +3.0 feet NGVD29. No minimum elevation applies.

F. Continuous-Monitoring Hydrological Well

An hydrological well is to be placed near the center of the site, but not in an extreme topographic position. Placement of these hydrological wells shall be as indicated on a GIS well grid-map as provided by Everglades National Park. The top of the well shall have a mounting platform that is a minimum of 36 inches (88 cm) and maximum of 40 inches (98 cm) above ground level.

The wells shall be installed according to the standards set by the Everglades National Park Hydrology Department to operate within a range of 12 feet (3.5 meters) below and 29 inches (0.75 meters) above ground level. In order to accomplish this quality of finished well, the unfinished well must be a minimum of 18 inches (44 cm) in diameter and be fully slotted starting at a depth of 1 foot (30 cm) below the top of the bedrock. The well must be blown-out during the drilling process using airlifting or comparable technology. The well must be lined with a minimum of 12" inside diameter PVC pipe. The pipe must have slots every 6 inches around the pipe to within 1 foot (30 cm) of the surface of the bedrock to ensure good water equilibrium within the well. The annular space shall be back-filled with coarse gravel to the top of the slotted screen, then completed with a concrete collar to the ground surface and a 4" X 3' X 3' poured concrete pad to

PERMIT NO. 13411018

anchor the well casing. The finished well shall be fully developed until all remaining sediment has been removed.

A PVC collar no less than 2 inches wide, shall be attached to the top end of the PVC well pipe to serve as a mounting platform for EVER environmental monitoring equipment. All well mounting platforms are to be placed level using a bubble level and the elevation of the top surface of the platforms are to be surveyed to within ± 0.1 feet (± 0.3 cm) NGVD.

G. Staging Area

If requested, a staging area will be made available for the refueling and staging of equipment and will be designated by EVER. All equipment maintenance (other than necessary on-site repairs) office or equipment trailers, vehicles or any other equipment or supplies that must be stored or warehoused are to be kept at this location. Storage of fuel, if not delivered by fuel truck(s) but stored in stationary tanks, must meet OSHA and NPS standards for fuel storage facilities. The staging area must be maintained and/or returned to original condition or better after completion of the project.

H. Time Frames

All earth-work is to begin when the substrate is reasonably dry and workable. This will usually be during the dry season from approximately December through May. No work is to begin until final approval to begin is provided in writing by the Park. Approximate timing for commencement of earth-work will be December through May, each year. Contractors work for each site shall be completed within the dry season the work starts, barring any "Acts of God" that would create environmental conditions precluding this type of earth-work. No contract will be awarded that would require more than one dry season for completion. No earth-work should be planned outside of the December to May period or planned to extend into the following December to May season.

I. Final Considerations - Engineering Specifications

Prior to commencement of work, the contractor is to develop a tentative schedule for all engineering work, including time frames, type and number of pieces of equipment and approximate number of vehicles passing through park entrance station daily with approximate numbers of dump truck trips expected per day through the entrance station or along park roads. After completion of substrate removal and final grading of the mitigation site, any and all damage or disturbance to the road shoulder is to be repaired and the shoulder graded to approximately a 7:1 slope into the mitigation site in order to prevent drop-offs into the restored area. The road shoulder is to be reseeded with Bahia grass.

All motor vehicles, trucks, trailers or other equipment must meet Florida highway road weight specifications. If dump trucks are equipped with a third axle, it must be placed down (except on turns) in order to properly distribute the vehicle weight. Trucks must not be overfilled, are to be covered while traveling on roads, and are to be reasonably free of loose rubble before leaving the work site in order to prevent rubble on road, and to eliminate hazards to other vehicles from falling debris.

PERMIT NO.

132410469

The contractor must inform the designated EVER contact person(s) prior to bringing heavy equipment into the park. As each new piece(s) of equipment is needed the contractor must call the designated EVER contact.

All access roads created within the Hole-in-the-Donut for access to and from work sites must be created only from existing disturbed substrate within the Hole-in-the-Donut, and all traces of access road(s) must be removed from the restoration site(s).

Portions of these engineering specifications were developed using standard methodologies and procedures where available, and some were developed on site through trial and error for all cases where no standard methods were available. As such work is unique and in most cases unprecedented in scale and venture, these specifications may be modified as the project proceeds in order to enhance the quality or efficacy of this work.

MONITORING AND STUDY SPECIFICATIONS

JUN 20 1994

Overview

The study of plant community ecology has many methods available and almost as many proponents of one method or another. Approaches have varied from the subjective description (no longer considered scientifically valid) of vegetation with or without reference to associated environmental factors to complex quantitative analyses of the characteristics of the vegetation under consideration (Mueller-Dombois and Ellenberg 1974, Greig-Smith 1983, Green 1979, Myers and Shelton 1980, Sokal and Rolf 1969, Gauch 1982, USDA 1962, Marriot 1974). Since the purpose of this study is to monitor the response of the vegetation to a management action and the associated changes, community sampling and multivariate analysis methods have been chosen as the principal methods since they have the advantages of objectivity, speed and low cost, effective correlation with other factors, relevance to other study interests, and compatibility and comparability with similar studies in the literature (Gauch 1982). Total floristic composition is an important aspect of this study to evaluate effectiveness of exclusion of exotic species and for comparison to similar projects on other sites, and to undisturbed native prairies (Gauch 1982, Mueller-Dombois and Ellenberg 1974).

As is understandably the case with such studies, many questions arise as data from existing studies are analyzed. When such questions inevitably occur additional studies may be developed and implemented. Restoration has become an important element in many natural areas today, and these additional studies will assist everyone involved in the restoration of natural areas in understanding the dynamics of the restoration process, the processes relating to succession in highly disturbed sites, comparisons with natural relatively undisturbed sites, the function of wetlands and the links between these processes and environmental factors effecting or affecting them, and the management implications of land restoration. As results from previous and ongoing studies and other work are analyzed, procedures, specifications or methods for carrying out this project work, studying or monitoring these sites will be modified to incorporate new information for the purposes of enhancing or improving the quality or efficacy of this project.

A. Vegetation Sample Plots

PERMIT NO.

136210763

Vegetation sample plots will be placed throughout the site in order to best cover the expected range of variation of the environmental factors found throughout the site, and vegetation that will colonize the site (Mueller-Dombois and Ellenberg 1974, Krauss 1987). Each plot will be at least 100 m² in size in order to sample the upper limit of the empirical area given by Mueller-Dombois and Ellenberg (1974) to sample the total species composition of grassland and agricultural weed communities. The plot size chosen is also significantly larger than required for sampling everglades prairie communities (Porter 1967). The corners of all plots and subplots will be permanently marked with 1/2 inch rebar stakes driven into the substrate, and each plot will be permanently tagged and numbered for future reference. All plot corners will have GPS locations that will be labeled as part of the aerial photography and site survey work. Smaller subplots may be located in each plot in order to evaluate and monitor smaller scale phenomena. Separate plots may be established for other individual monitoring or biological or environmental evaluations that may be deemed important to further the understanding of wetland restoration.

Each plot will be sampled at the time of completion and at specified intervals (to be determined by sampling design and protocol for each element of the monitoring program) for the term on the project. All plots, subplots, sampling locations and wells are to be field numbered using tags of a permanent type material such as aluminum, and identification information (including GPS UTM location) is to be located on one blackline copy of the Topography and control sheet. Periphyton shall be considered as a species for sampling protocols involving macrophytes where appropriate.

B. Photopoints

Photopoints will be taken of each area before vegetation clearing, after vegetation clearing but before substrate removal, and after substrate removal. Additional photographs will be taken from the same locations once each year for the duration of funding for this study. Additional photographs of individual mitigation site will be established after substrate removal.

C. Hydrological Sampling

Continuous water level recorders shall be placed in within each project area. This finished wells are to be 18 inches (30.5 cm) wide, have an "effective" minimum depth of 6m. Mean water level shall be automatically recorded to NGVD29 every minute and averaged on the hour using a potentiometric data logger.

D. Additional Environmental Monitoring

Evapotranspiration and rainfall sampling will be added to the sensor arrays placed within the study area. These additional parameters will be used to assist in understanding the relationship to restoration dynamics of the site and environmental parameters.

E. Substrate Nutrient Analysis

A standard substrate analysis will be performed on the site before substrate removal. A minimum of one sample per 3 acres shall be taken. Samples are to be collected in a systematic grid pattern that covers the entire site. Analysis will include: a physical description of the soil, analysis for: N (ammoniacal nitrogen NH₄, nitrate nitrogen, and total nitrogen), P (phosphorous), K (potassium), Mg (Magnesium), Mn (Manganese), Fe (Iron), Cu (Copper), Zn (Zinc), organic content, chlorides, conductivity and pH. A second set of twenty samples are to be taken at the 12, 24, and 36 month monitoring intervals.

F. Additional Responsibilities of Contractor(s)

The contractor shall develop a schedule for monitoring all variables described in A, C, D and E above, which will be subject to the approval of EVER personnel. Standardized data collection formats and computer data entry methods will be used for data collection and data entry. Quality of data and entry will be subject to the review and approval of EVER personnel. All raw data and data formatted for analysis as specified below, maps, drawings, photographs, tables, etc. shall be available to EVER personnel within 30 days after each monitoring cycle and become the sole property of Everglades National Park at the end of the period for which the contractor is responsible for the monitoring program.

DATA ANALYSIS

JUN 20 1994

A. Vegetation

The synthesis table technique as described by Mueller-Dombois and Ellenberg (1974) and Gauch (1982) will be used to arrange the sample plots in a sequence that brings together plots similar in species composition and, similarly, to arrange the species in a sequence that brings together species similar in their distributions in the samples. Thus, groups of sample plots can be identified that are similar in their vegetation structure and floristic composition. Sample plot vegetation data will be input into a species/sample plot matrix with the appropriate format for use in the COENOS program, which is an adaptation for use on a IBM PC or 100% compatible computer of an earlier main frame program for synthesis table analysis (Ceska and Roemer 1971).

To supplement the synthesis table analysis, the data will also be analyzed with the dendrograph technique as described by Mueller-Dombois and Ellenberg (1974). A dendrograph will be produced which displays the mutual relationships among the sample plots whose pairwise similarities are given. The dendrograph will be entirely based on a similarity matrix that will be calculated using several calculation methods. Data will be input into a matrix in ASCII format appropriate for input into MVSP, a program to analyze sample plot data on an IBM PC or 100% compatible computer using the dendrogram technique (Kovach 1986).

Previously identified and permanently marked plots where the vegetation communities recolonizing the Donut area at various time intervals since abandonment have been described, will serve as controls.

B. Hydrology Data

Water table levels will be determined relative to mean sea level and substrate surface. Hydroperiod at each well site will then be determined and analyzed for correlations with vegetation colonization.

PERMIT NO. 132415479

LITERATURE CITED

- Alexander, T. R., and A. G. Crook. 1973. Recent and long-term vegetation changes and patterns in South Florida: Part I: Preliminary Report. South Florida Environmental Project. University of Miami, Coral Gables, Florida. 224 p. PB-231.939.
- Alexander, T. R., and A. G. Crook. 1975. Recent and long-term vegetation changes and patterns in South Florida: Part II: Final Report. South Florida Ecological Study. University of Miami, Coral Gables, Florida. 827p.
- Allen, H. H. 1936. Indigine versus alien in the New Zealand plant world. *Ecology* 17: 187-193.
- Bridgewater, P. B., and D. J. Backshall. 1981. Dynamics of some Western Australian ligneous formations with special reference to the invasion of exotic species. *Vegetatio* 46: 141-148.
- Ceska, A. and H. Roemer. 1971. A computer program for identifying species-releve-groups in vegetation studies. *Vegetatio* 23: 255-277.
- Craighead F. C., SR. 1971. The Trees of South Florida. University of Miami Press, Coral Gable, Florida. 212p.
- Crawley, M. J. 1987. What makes a community invasible? pp. 429-453, in A. J. Gray, M. S. Crawley, and P. J. Edwards (eds.), Colonization, Succession, and Stability. Blackwell Scientific Publications, Oxford.
- Davis, J. H., JR. 1943. Vegetation of the Everglades and conservation from the point of view of the plant ecologist. *Proc. Soil Sci. Soc. Fla.* 5A: 104-115.
- Doren, R. F. and L. Whiteaker. in prep. Fire effects on secondary successional communities in Everglades National Park: the Hole-in-the-Donut.
- Egler, F. E. 1942. Indigine versus alien in the development of arid Hawaiian vegetation. *Ecology* 23: 14-23.
- Egler, F. E. 1952. Southeast saline Everglades vegetation, Florida, and its management. *Vegetatio* 3: 213-265.
- Ewei, J. J., D. S. Ojima, D. A. Karl, and W. F. DeBusk. 1982. *Schinus* in successional ecosystems of Everglades National Park. South Florida Research Center Report T-676. 141 pp.
- Ewei, J. J. 1986. Invasibility: lessons from South Florida. pp. 214-230 in H. A. Mooney and J. Drake (eds.), Ecology of Biological Invasions of North America and Hawaii. Springer-Verlag, New York.
- Florida Department of Transportation. 1986. Standard Specifications for Road Bridge Construction. Edition of 1986. Florida D.O.T., Tallahassee.
- Freese, F. 1962. Elementary Forest Sampling. Agriculture Handbook No. 232. U.S. Department of Agriculture, Forest Service.

- Gauch, H. G. 1982. Multivariate Analysis in Community Ecology. Cambridge University Press, New York.
- Gerrish, G., and D. Mueller-Dombois. 1980. Behavior of native and non-native plants in two tropical rainforests on Oahu, Hawaiian Islands. *Phytocoenologia* 8: 237-295.
- Green, R. H. 1979. Sampling Design and Statistical Methods for Environmental Biologists. John Wiley and Sons, New York.
- Greig-Smith, P. 1983. Quantitative Plant Ecology (Studies in Ecology, Volume 9). University of California Press, Berkeley.
- Harper, J. L. 1965. Establishment, aggression and cohabitation in weedy species. pp. 243-265. in H. G. Baker and G. L. Stebbins (eds.), The Genetics of Colonizing Species. Academic Press, New York.
- Hartman, H. T., D. E. Kester 1968. Plant Propagation Principles and Practices. Prentice-Hall, Inc., New Jersey.
- Hilsenbeck, C. E. 1976. An investigation of old field succession in Everglades National Park. 1st Interim Report. Everglades National Park. 63 pp.
- Keever, P. 1950. Causes of succession on old fields of the Piedmont, North Carolina. *Ecological Monographs* 20: 229-250.
- Kovach, W. L. 1986. A Multivariate Statistics Package for the IBM PC and Compatibles. Indiana University, Bloomington.
- Krauss, P. 1987. Old Field Succession in Everglades National Park. South Florida Research Center Report, SFRC-87/03. 75 pp.
- Little, E. L., JR. 1978. Atlas of United States Trees, Vol. 5. Florida. U.S. Department of Agriculture, Forest Service, Misc. Publ. No. 1361. 256 + maps.
- Long, R. W. 1974. Vegetation of southern Florida. *Florida Scientist* 37: 33-45.
- Long, R. W., and O. Lakela. 1971. A Flora of Tropical Florida. A Manual of the Seed Plants and Ferns of Southern Peninsular Florida. University of Miami Press, Coral Gables, Florida. 962 pp.
- Loope, L. L., and G. N. Avery. 1979. A preliminary report on rare plant species in the flora of National Park Service areas of South Florida. South Florida Research Center Report M-548. 42 pp.
- Loope, L. L., and V. L. Dunevitz. 1981. Investigations of early plant succession on abandoned farmland in Everglades National Park. South Florida Research Center Report T-644. 65 pp.
- Marriot, F. H. C. 1974. The Interpretation of Multiple Observations. Academic Press Inc., New York.

PERMIT NO. 132410769

- McCormick, J., and M. F. Buehl. 1957. Natural revegetation of a plowed field in the New Jersey Pine Barrens. *Botan. Gaz.* 118: 261-264.
- Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and Methods of Vegetation Ecology. John Wiley and Sons, New York.
- Myers, R. L. 1983. Site susceptibility to invasion by the exotic tree *Melaleuca quinquenervia* in southern Florida. *Journal of Applied Ecology* 20: 645-658.
- Myers, W. L. and R. L. Shelton. 1980. Survey Methods for Ecosystem Management. John Wiley and Sons, New York.
- Odum, E. P. 1960. Organic production and turnover in old field successions. *Ecology* 41: 34-49.
- Oosting, H. J. 1942. An ecological analysis of the plant communities of Piedmont, North Carolina. *American Midland Naturalist* 28: 1-126.
- Porter, C. L., Jr. 1967. Composition and Productivity of a Subtropical Prairie. *Ecology* 48, No. 6: 937-942.
- Robertson, W. B., JR. 1953. A survey of the effects of fire in Everglades National Park. Mimeo Report. 169 pp.
- Robertson, W. B., JR. 1955. An analysis of the breeding-bird populations of tropical Florida in relation to the vegetation. Ph.D. Dissertation. University of Illinois. 599 pp.
- Small, J. K. 1904. Report upon further exploration of southern Florida. *Jour. N.Y. Bot. Gard.* 5: 157-164.
- Small, J. K. 1929. From Eden to Sahara: Florida's Tragedy. Science Press Printing Co., Lancaster, Pa. 123 pp.
- Smith, C.W. 1985. Impact of alien plants on Hawaii's native biota. pp. 180-250 in C. P. Stone and J. M. Scott (eds.), Hawaii's Terrestrial Ecosystems: Preservation and Management. Cooperative National Park Resources Study Unit, University of Hawaii, Honolulu.
- Sokal, R. R. and F. J. Rohlf. 1969. Biometry: The Principles and Practice of Statistics in Biological Research. W. H. Freeman and Co., San Francisco.
- Sukopp, H., and L. Trepl. 1987. Extinction and naturalization of plant species as related to ecosystem structure and function. pp. 245-276. in E. D. Schulze and H. Zedler (eds.), Potentials and Limitations of Ecosystem Analysis. Springer-Verlag, Berlin.
- Tomlinson, P. B. 1980. The Biology of Trees Native to Tropical Florida. Harvard University Printing Office, Allston, MA. 480 pp.
- USDA. 1958. Soil survey of Dade County, Florida. Series 1147, No. 4. Soil Conservation Service and the University of Florida Agricultural Experiment Station.

Wade, D., J. Ewel, and R. Hofstetter. 1980. Fire in South Florida Ecosystems. U.S. Department of Agriculture, Forest Service. General Technical Report SE-17. Southeast Forest Experiment Station. Asheville, North Carolina. 125 pp.

Whiteaker, L. and R. F. Doren. 1989. Exotic Plant Species Management Strategies and List of Exotic Species in Prioritized Categories for Everglades National Park. U.S. Dept. of Interior, National Park Service, Research/Resource Management Report SER-89/04. Southeast Regional Office, Atlanta, GA. 21 pp.

JUN 20 1994

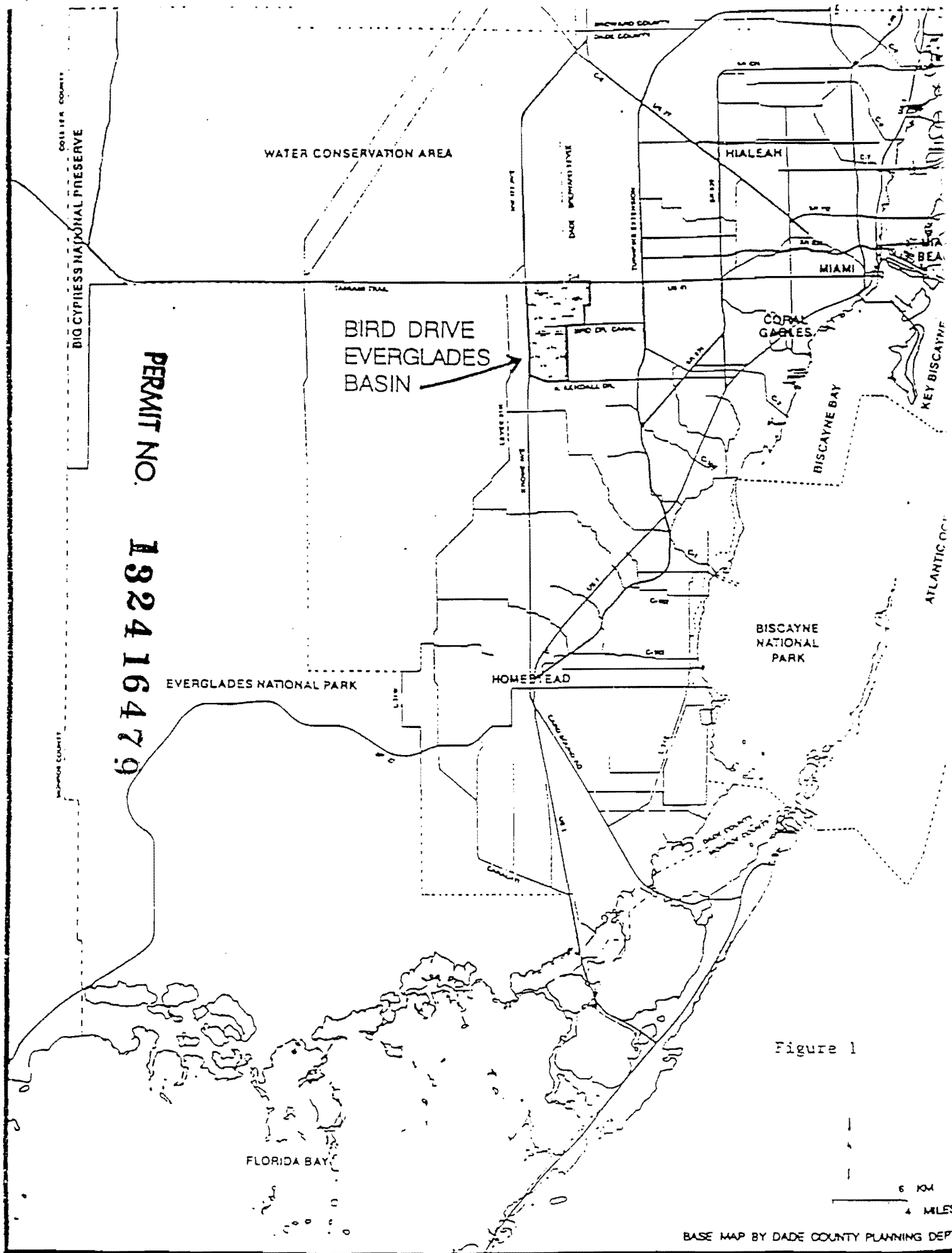
PERMIT NC. 132416479

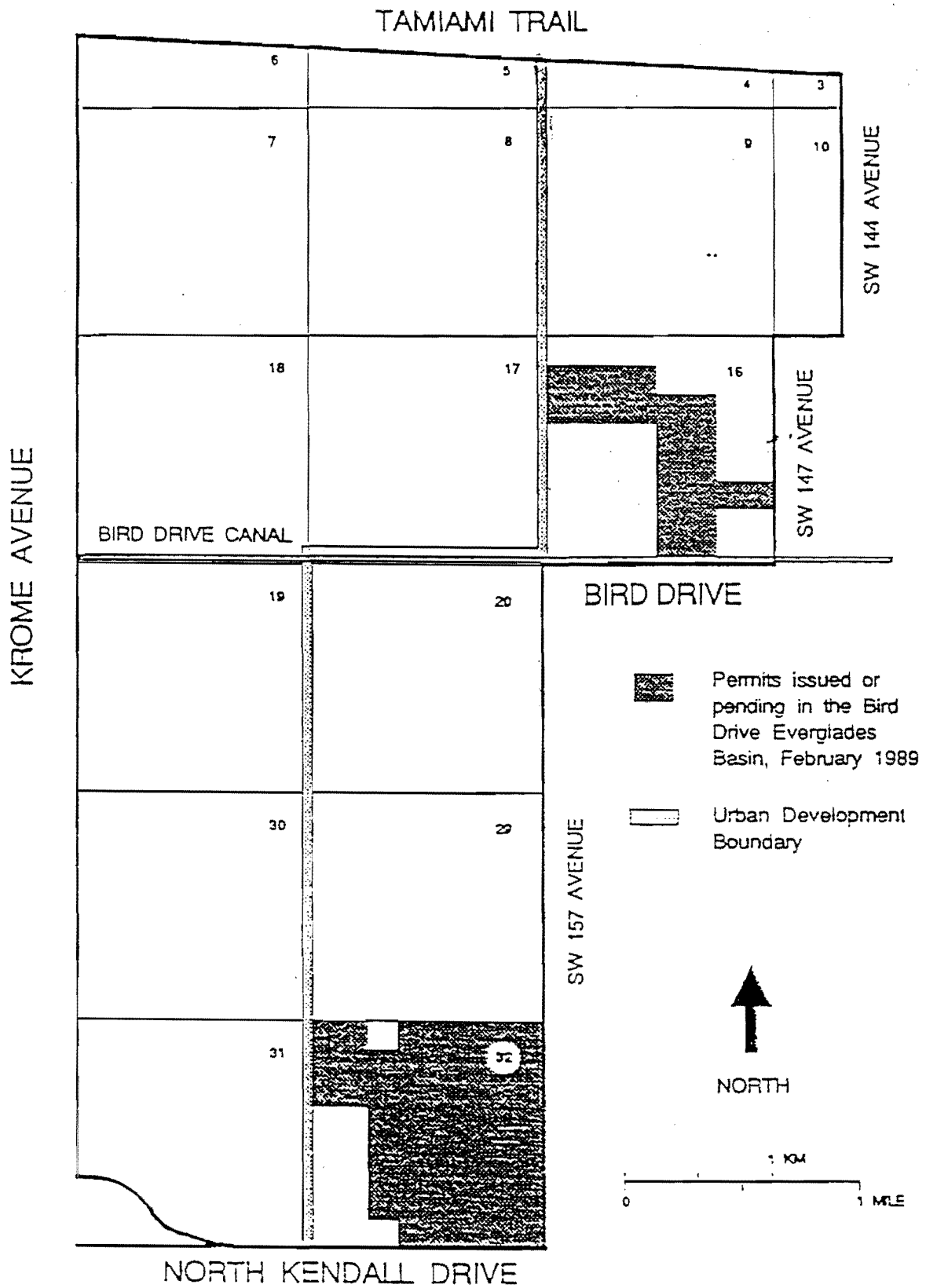
TABLE 2.- Per Acre Budget

Per acre costs based on previous project costs and cost estimates and attached specifications.

Land clearing, vegetation and substrate removal	7,800.00
Aerial Photography	70.00
Topographic surveys	350.00
Hydrological well construction, placement and survey	10.00
USACOE cost for contracting of earth-works (7% of contract costs)	576.10
Monitoring and Study of Physical and Biological Parameters	5,600.00
15% Administrative and Project Support Costs - EVER	2,160.92
TOTAL COST PER ACRE	16,567.02

PERMIT NO. 1324 10479





PERMIT NO. 132410469

(2.)

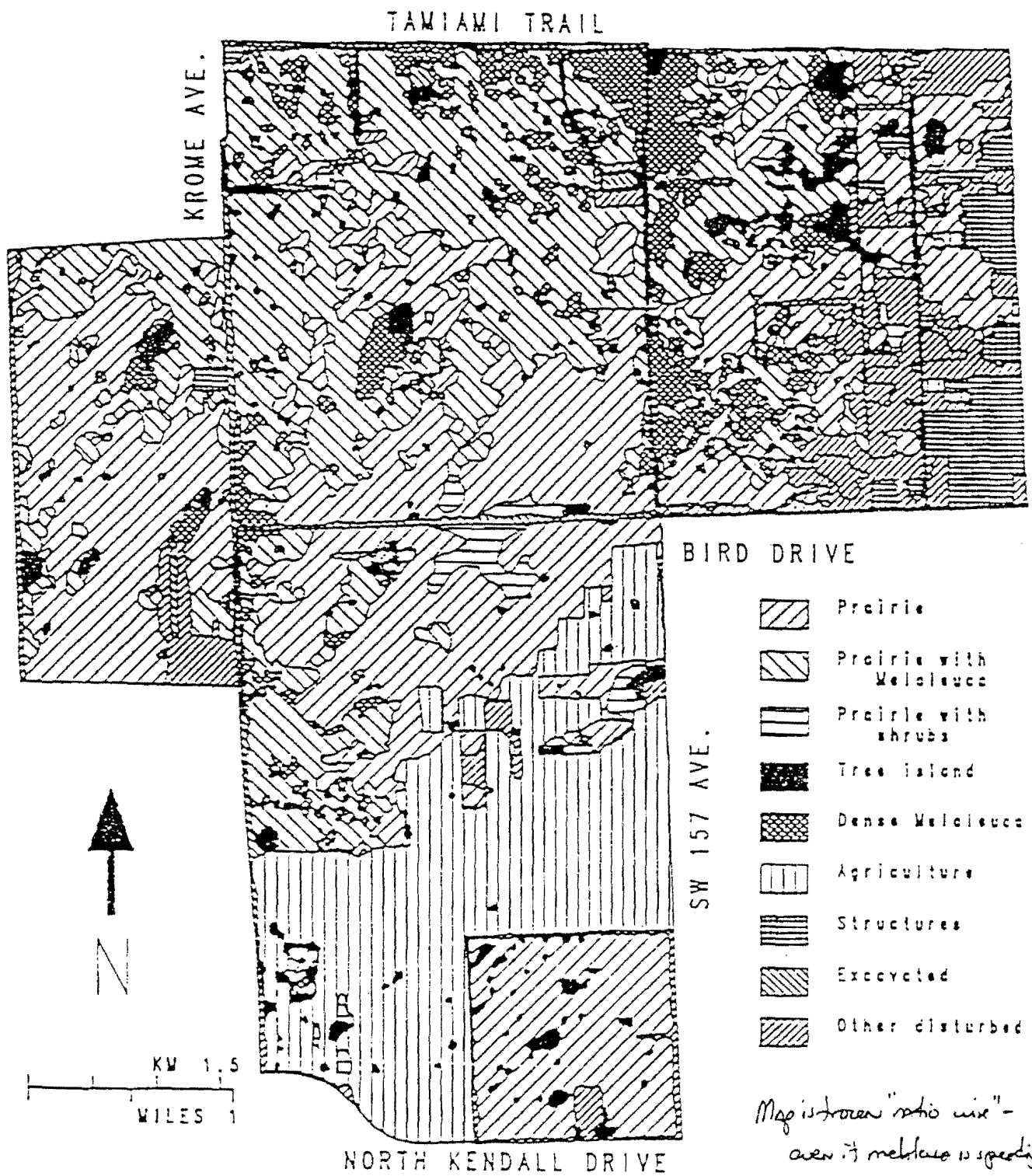


Figure 8

PLANT 1 3 4 1 1 4 7 8

TABLE 1
BIRD DRIVE EVERGLADES BASIN
VEGETATION/LAND USE

VEGETATION/LAND USE	AREA (ACRES)
Prairie	2109
Prairie with shrubs	162
Prairie with Melaleuca	2312
Tree Islands	168
Dense Melaleuca	771
Agriculture	1635
Structures	17
Disturbed - forested with excavation	82
Disturbed - open	217
Disturbed - forested	200
Disturbed - excavated	<u>94</u>
	7767

PERMIT NO. 1324 16479

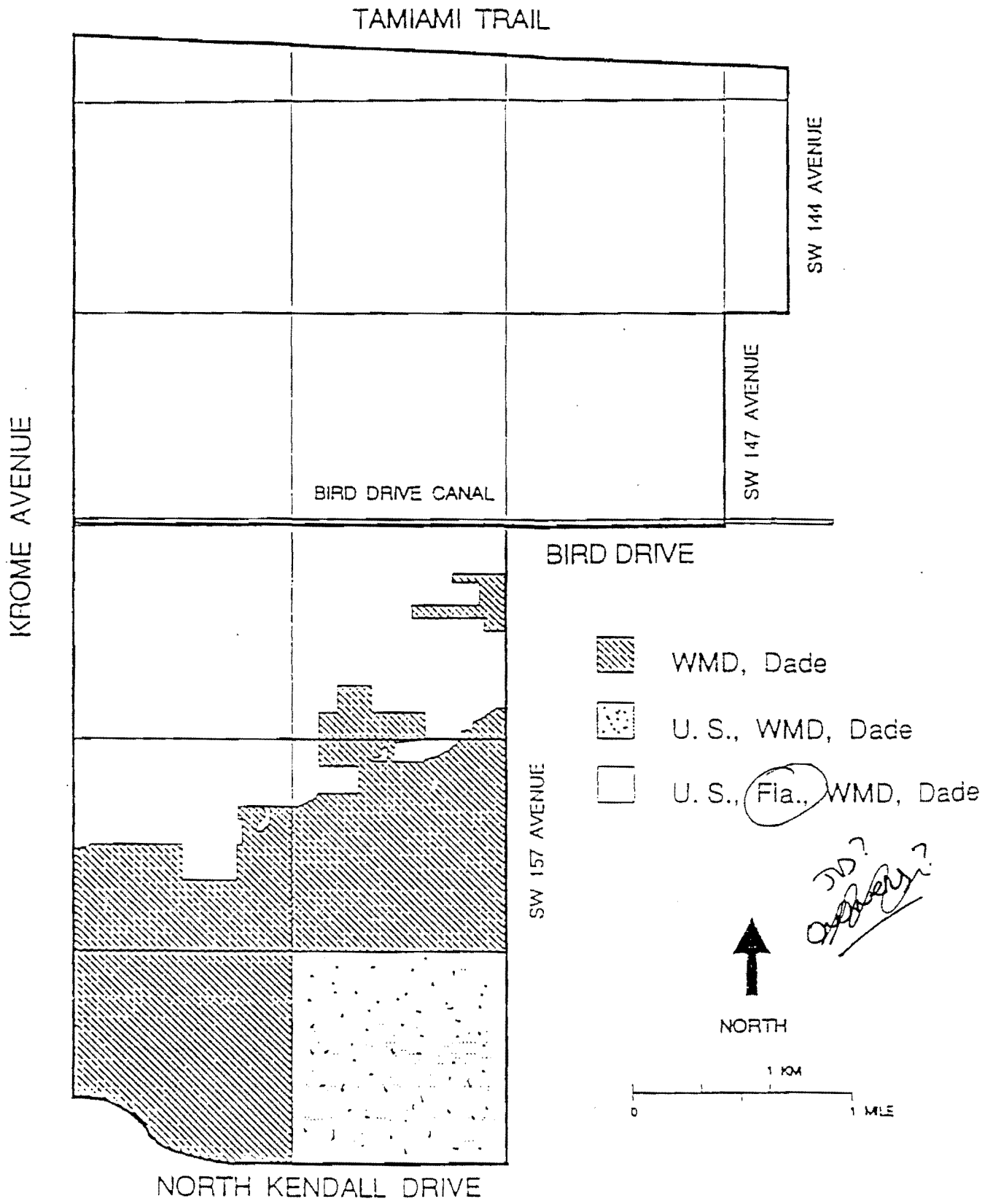


Figure 7

PERMIT NO. 1324 10469

5

WEST WELLFIELD INTERIM PROTECTION BOUNDARIES

BASED ON 140 MGD'S FROM THE NE SITES

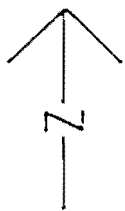
DRAWING INTERIM3
DATE: 12/12/88

025 FT DRAWDOWN LDE

SR 836

TAMIAMI CANAL

1
MILE



L-31

30 DAYS
LDE

H.E.F.T.

KENDALL DR

SW 112 ST

SW 120 ST

SW 137 AVE

TAMIAMI
AIRPORT

SW 152 ST

PERMIT NO.

132416479

METRO DADE COUNTY
DEPARTMENT OF ENVIRONMENTAL
RESOURCES MANAGEMENT

WEST WELLFIELD

(6.)

SCALE:
1" = 10000'

PROPOSED OFF-SITE MITIGATION AREAS

WATER CONSERVATION AREA

PERMIT NO.

1324164,9

EVERGLADES
NATIONAL
PARK

FLORIDA BAY

TAMIAMITRAIL

6

HOMESTEAD

BISCAYNE
NATIONAL
PARK

LEGEND

1. The Frog Pond
2. The North C-111 Basin
3. The North Card Sound Basin
4. The Pennsuko Everglades
5. ENP (Hole-in-the-Donut)
6. East Everglades Purchase Area

FIGURE 2

TABLE 2

MITIGATION PLAN EVALUATION MATRIX

POTENTIAL MITIGATION AREA	PROPOSED MITIGATION CREDIT (IN SQ. MI.)	TOTAL AREA IN SITE (IN SQ. MI.)	ESTIMATED CAPITAL COSTS (IN \$ MILLION)	ESTIMATED MAINT. COSTS (IN \$ MILLION)	SIMILARITY TO BASIN WETLANDS (HYDROLOGICAL)	DISTANCE FROM BASIN WETLANDS	OFF-SITE BENEFITS	ADMINIS. DIFFICULTY (OWNERSHIP PATTERNS)	PROBABILITY OF SUCCESS	NET WETLAND CREATION	OVERALL MITIGATION POTENTIAL
THE FROG POND	2.6	2.00	4.21 ¹	0.056	HIGH MODERATE	LONG	HIGH	LOW	HIGH MODERATE	HIGH	HIGH
NORTH C-111 BASIN	1.47	7.63	14.27	0.12	MODERATE	LONG	MODERATE	HIGH MODERATE	MODERATE	MODERATE	MODERATE
NORTH CARD SOUND BASIN	1.41	7.0	14.64	0.11	MODERATE	LONG	MODERATE	HIGH MODERATE	MODERATE	MODERATE	MODERATE
PEMBUCCO EVERGLADES	3.7	10.4	21.7 ²	0.57	LOW MODERATE	ADJACENT	MODERATE	MODERATE	HIGH	LOW	HIGH MODERATE
EVERGLADES NATIONAL PARK HOLE-IN- THE-DOUGH	5+	5+	20.0	0.00	LOW MODERATE	LONG	HIGH MODERATE	N/A	MODERATE	LOW	MODERATE
EAST EVERGLADES PURCHASE AREA	6.3	6.3	24.2 ³	1.0	HIGH MODERATE	MODERATE	HIGH MODERATE	³ N/A	HIGH	LOW	MODERATE

1. Includes canal work but not scrape down.

2. Does not include matching land acquisition funds from SFRMD SOR program.

3. Does not include land cost or administrative efforts.

PERMIT NO. 182416479

Vegetation Existing

PERMIT NO 132416479

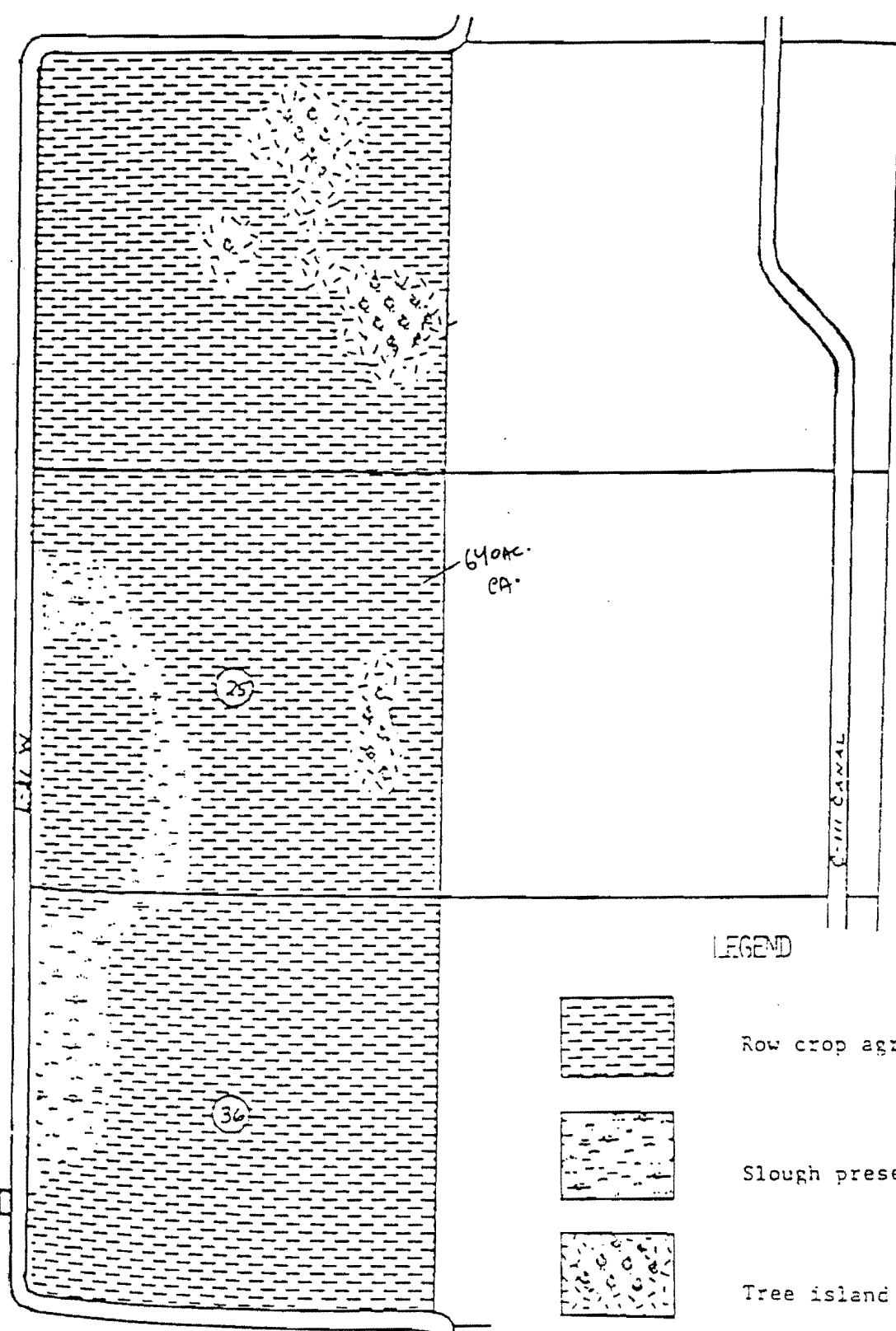
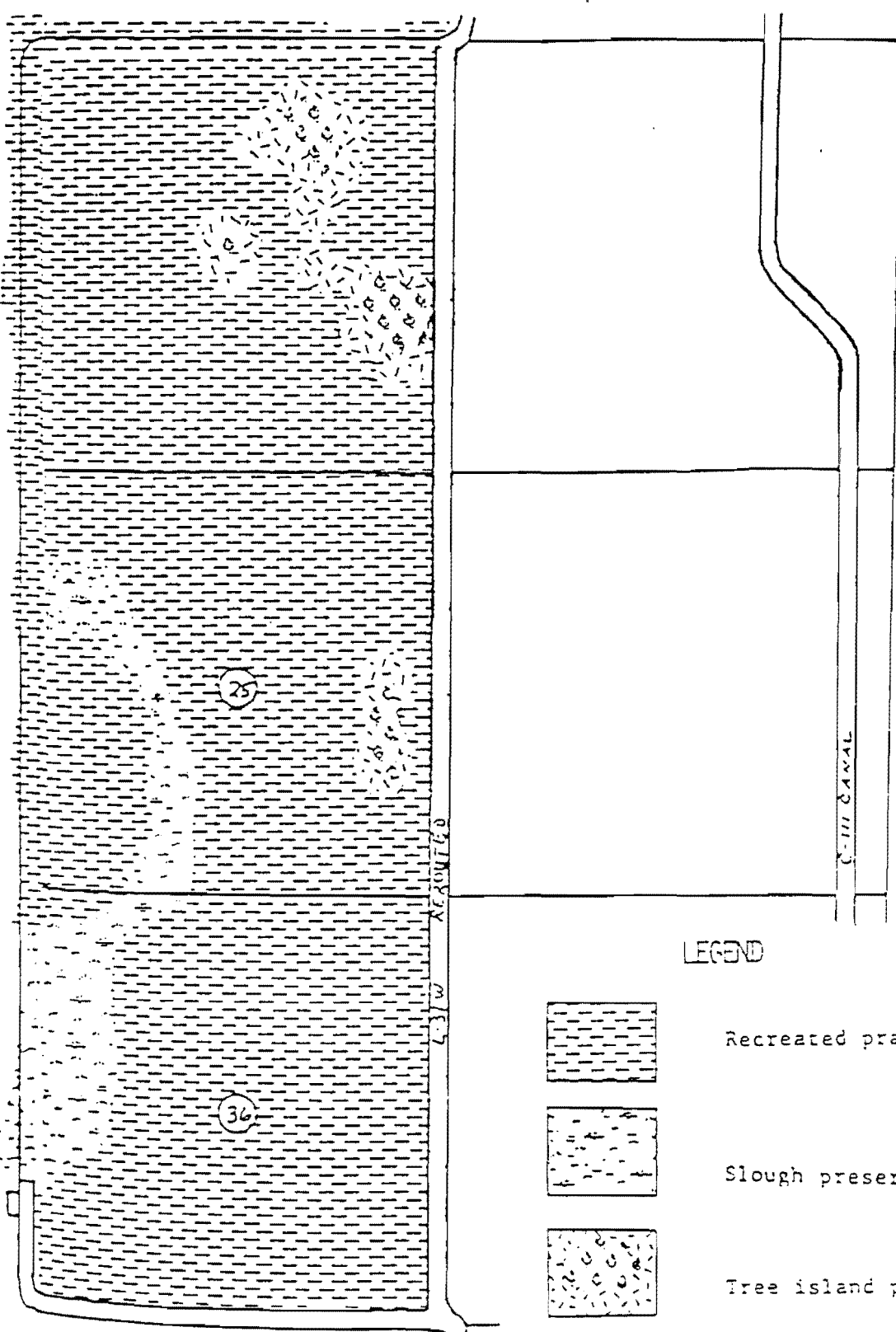


FIGURE A1

The Frog Pond Vegetation Mitigation

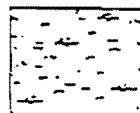
PERMIT NO. 132416479



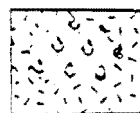
LEGEND



Recreated prairie



Slough preservation area



Tree island preservation area

SCALE 1:24000

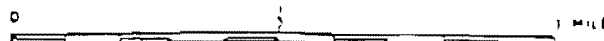


FIGURE A4

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
AND
METROPOLITAN DADE COUNTY
(DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT)

THIS AGREEMENT is made and entered into this 27th
day of APRIL 1993, by and between the Florida Department of
Environmental Regulation (hereinafter the "DER") and
Metropolitan Dade County, a political subdivision of the
State of Florida, by and through its Department of
Environmental Resources Management (hereinafter the
"COUNTY").

ARTICLE I. BACKGROUND AND OBJECTIVES

13 sq. miles

WHEREAS, the Bird Drive Everglades Wetland Basin and
the North Trail Wetland Basin are part of a vast expanse of
seasonally-inundated lands, known as the Everglades;

WHEREAS, the Bird Drive Wetland Basin is that
freshwater wetland described as that portion of Section 3,
Township 54 South, Range 39 East lying south of U.S. Highway
41 (Tamiami Trail) and lying west of S.W. 143 Avenue north of

PERMIT NO. 132410479

MAY 16 1993

S.W. 9th Terrace and lying west of S.W. 144 Avenue south of S.W. 9th Terrace; those portions of Sections 4,5, and 6, Township 54 South, Range 39 East lying south of U.S. Highway 41 (Tamiami Trail); that portion of Section 10, Township 54 South, Range 39 East lying west of S.W. 144 Avenue; that portion of Section 31, Township 54 South, Range 39 East, lying north of S.W. 88th Street (North Kendall Drive); and Sections 7,8,9,16,17,18,19,20,29,30 and 32, Township 54 South, Range 39 East; and

WHEREAS, the North Trail Wetland Basin is that freshwater wetland described as that portion of Section 3, Township 54 South, Range 39 East lying north of U.S. Highway 41 (Tamiami Trail); that portion of Section 4, Township 54 South, Range 39 East lying north of U.S. Highway 41 (Tamiami Trail); Government Lot 2, located between Townships 53 and 54 South, Range 39 East; Government Lot 3, located between Townships 53 and 54 South, Range 39 East and Government Lot 4 located between Townships 53 and 54 South, Range 39 East; and

WHEREAS, the Bird Drive Everglades Wetland Basin and the North Trail Wetland Basin have been the subject of agricultural, residential and industrial development; and

WHEREAS, in 1987, the County, at the request of the U.S. Army Corps of Engineers, convened the Special Area Management Plan (SAMP) Committee for the purposes of

PERMIT NO. 132410469

MAY 19 1987

evaluating the environmental resources of the Bird Drive Everglades Wetland Basin and developing a management plan which would identify the types, locations and time-phasing of acceptable development activities for this basin, water management activities and regulations; the location and type of wetland protection and mitigation areas; and the implementation strategies, including a financing plan and required environmental regulations; and

WHEREAS, the SAMP Committee included representatives of the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish & Wildlife Service, the Florida Department of Environmental Regulation, the South Florida Water Management District, the Dade County Planning Department and the Dade County Department of Environmental Resources Management (DERM); and

WHEREAS, in 1989 and 1990, the COUNTY prepared, and the SAMP Committee reviewed and approved, several resource identification studies including: the Bird Drive Everglades Basin / Pennsuco Wetlands Vegetation and Cover Type Mapping Study (DERM Technical Report 89-5); Bird Drive Everglades Basin Special Area Management Plan: Baseline Studies and Resource Evaluation (DERM Technical Report 90-6) and Bird Drive Everglades Basin Special Area Management Plan: Off-site Mitigation Alternatives (DERM Technical Report 90-5); and

PERMIT NO. 1324 10479

ALL PERMITS
MAY 19 1990

WHEREAS, in 1991, the COUNTY prepared, and the SAMP Committee reviewed, the North Trail Basin: Baseline Studies and Resource Evaluation Report (DERM Technical Report 91-3); and

WHEREAS, upon the review of all the aforementioned technical documents and site inspections of each wetland basin, the SAMP Committee agreed that both wetland areas have been adversely impacted by past drainage and the invasion of exotic plant species (in particular Melaleuca quinquenervia) and concluded that the restoration of portions of these basins was neither practical nor feasible; and

WHEREAS, the member agencies of SAMP Committee are prepared to permit limited development within those portions of the Bird Drive Everglades Wetland Basin and North Trail Wetland Basin located within the Year 2000 Urban Development Boundary Line as depicted on the 1988 Comprehensive Development Master Plan's Land Use Map, which is maintained by the Dade County Planning Department; and

WHEREAS, the SAMP Committee has determined that, given the existing hydrologic conditions in each basin and the potential impacts associated with the proposed Dade County West Wellfield, on-site mitigation is not feasible; and

PERMIT NO. 132410478

RECEIVED
JAN 10 1992

WHEREAS, the member agencies of the SAMP Committee and Everglades National Park (hereinafter referred to as "the Park") have agreed to establish a cooperative program to restore freshwater wetlands in the area of the Park known as the "Hole-in-the-Donut" (a description of which is attached as Attachment "A"); and

WHEREAS, on July 21, 1992, the Dade County Board of County Commissioners created Section 24-58.21 of the Code of Metropolitan Dade County, which established the Freshwater Wetland Mitigation Trust Fund for receiving mitigation contributions from developers in the Bird Drive Everglades Wetland Basin and the North Trail Wetland Basin; and

WHEREAS, the Freshwater Wetlands Mitigation Trust Fund was created for use in acquiring, (including by eminent domain,) restoring, enhancing, managing or monitoring wetlands within Dade County.

NOW, THEREFORE, in consideration of these premises and mutual covenants contained herein, the parties agree as follows:

PERMIT NO. 132410409

State of Florida
MAY 10 1993

ARTICLE II. STATEMENT OF WORK

1) The COUNTY shall be responsible for the collection of the mitigation contributions for work approved by the COUNTY and the DER, in the amounts determined by the COUNTY and the DER as part of that approval, for those properties located within the Urban Development Boundary Line in the Bird Drive Everglades Wetland Basin and the North Trail Wetland Basin. Said funds shall be deposited by the COUNTY into the Dade County Freshwater Wetlands Mitigation Trust Fund (the "FWMT Fund"); which, pursuant to Section 24-58.21(A)(3) of the Code of Metropolitan Dade County, shall not be commingled with other County Funds until disbursed for an authorized purpose pursuant to Section 24-58.21(A)(4) of the Code of Metropolitan Dade County.

2) The COUNTY shall disburse monies from the FWMT Fund, in accordance with the provisions of Section 24-58.21(A)(4) of the Code of Metropolitan Dade County, for mitigation projects selected and approved pursuant to paragraph 4 of this Article. Specifically, funds may only be disbursed for the acquisition, (including by eminent domain,) restoration, enhancement, management or monitoring of wetland properties located within Dade County. Funds may also be disbursed for all costs associated with each such acquisition (as applicable) including, but not limited to, appraisals, surveys, title search work, real property taxes, documentary

PERMIT NO. 1324 16479

RECEIVED BY
REAL ESTATE DIVISION
MAY 1 1985

stamps and surtax fees, and other transaction costs. Costs of administering the activities identified above will be funded from the proceeds of the Freshwater Wetlands Trust until such time as the fund is closed.

3) The COUNTY shall disburse funds to Everglades National Park, for use in the restoration of that area of the Park known as the "Hole-in-the-Donut". The cumulative amount payable to the Park in any calendar year shall not exceed the monetary figure equal to that percentage of the total amount collected which has been designated (by consultation with the SAMP Committee and approval by DER, DERM, and the Corps of Engineers) for use in restoring the Hole-in-the-Donut. Interest accrued on this principal amount prior to disbursement to the Park may be retained by the COUNTY for use for reimbursement for reasonably-incurred administrative costs.

4) The COUNTY shall maintain the balance of the total contribution amount collected for work in the subject wetland basins in Trust until DER, DERM and the Corps of Engineers, following consultation with the SAMP Committee, have selected and approved mitigation project(s) located in Dade County for which those monies are to be utilized, at which time, disbursement of those funds for such project(s) shall be made.

PERMIT NO. 132410479

RECEIVED
FEB 20 1977

5) The COUNTY shall keep accounting records which conform with generally accepted accounting principles which shall include, but not be limited to, a cash receipt journal, cash disbursement journal, general ledger, and all such subsidiary ledgers as reasonably necessary. All such reports will be retained by the COUNTY for not less than five (5) years beyond the term of this Agreement.

6) The COUNTY shall provide access to all of its records which relate to this Agreement and agrees to provide such assistance as may be necessary to facilitate their review by the DER when deemed necessary by the DER to insure compliance with accounting and financial standards. The DER shall have the right to access all such records for not less than five (5) years beyond the term of this Agreement.

7) The COUNTY shall make all records or documents which relate to this Agreement available to the DER at the office of the DERM during regular business hours.

ARTICLE III. TERM OF AGREEMENT; EXTENSION

(a) Initial Term. This Agreement shall be for an initial term of five (5) years; beginning on the date of execution.

(b) Extension Term(s). This Agreement may be extended upon the same terms and conditions by mutual written agreement of

PERMIT NO. 132410479

RECEIVED
MAY 10 1982

both parties.

(c) Continuation of this Agreement (in whole or in part) beyond the term specified in paragraph (a) above is contingent upon the availability of funds.

ARTICLE IV. KEY OFFICIALS

THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION :

The Secretary, or authorized delegatee, will provide review and approval of terms of all agreements, and will exercise the authority to approve conduct of cooperative projects with regards to the conditions contained herein. The Chief of the Bureau of Wetland Resource Management shall act as the authorized technical representative for DER with regard to the technical scope of this Agreement.

The DER shall provide written notice to DERM of any change in key officials within four (4) weeks of such change.

DERM: Frank Bernardino, Assistant to the Director, shall act as the authorized technical representative for DERM with regard to the technical scope of this Agreement. The COUNTY shall provide written notice to the DER of any change in authorized technical representative within four (4) weeks of such change.

PERMIT NO. 132410479

MAY 10 1983

ARTICLE V. PROPERTY UTILIZATION N/A

ARTICLE VI. PRIOR APPROVAL N/A

ARTICLE VII. REPORTS

1) Quarterly reports will be generated by Everglades National Park for the restoration work occurring in the "Hole-in-the-Donut" and provided to the member agencies of the SAMP Committee to communicate progress of the program.

2) The COUNTY shall provide to the DER a monthly statement in writing, showing the net amount remaining in the FWMT Fund (which "net amount" shall equal the monthly gross income to the FWMT Fund, plus the accrued monthly interests, minus any disbursements made pursuant to Article II, Paragraphs 2 and 3 of this Agreement, including payment of invoices for project costs associated with the restoration of that area of the Park known as the "Hole-in-the-Donut"), by no later than thirty (30) days after the end of each month.

3) The COUNTY shall submit an annual report to the DER for the previous fiscal year (October 1st through September 30th), due on January 1st of every year, detailing the amounts of monies collected and disbursed, including any disbursement to the COUNTY for administrative costs pursuant to Article II, Paragraph 3.

PERMIT NO. 132410479

ARTICLE VIII. AMENDMENT

This Agreement may be modified by amendment upon mutual written agreement of both parties.

ARTICLE IX. TERMINATION

(a) This Agreement shall terminate automatically unless the same is extended pursuant to Article III by mutual written agreement prior to the expiration date of this Agreement.

(b) Either the DER or the COUNTY may terminate this Agreement at any time by providing sixty (60) days written notice to the other party, provided that all monies have been disbursed to the Park as required by DER permit conditions and that no other monies required to be deposited into the FWMT Fund by DER permit conditions remain in the fund.

ARTICLE X. REQUIRED CLAUSES

*During the performance of this Agreement, the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their

PERMIT NO. 132416479

RECEIVED
JULY 12 1982
100-10-1000

race, color, religion, sex or national origin."

"No member or delegate to Congress, the State Legislature, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit."

ARTICLE XI. NOTICES

All notices required or permitted to be given under the terms and provisions of this agreement by either party to the other shall be in writing and shall be sent by registered or certified mail, return receipt requested, to the parties as follows:

As to the COUNTY:

John W. Renfrow, Director
Attn.: Frank Bernardino
111 N.W. 1st Street, Suite 1310
Miami, Florida 33128

As to the DER:

Virginia B. Wetherell, Secretary
Attn.: Janet Llewellyn
Florida Department of Environmental Regulation
2600 Blair Stone Road
Twin Towers
Tallahassee, Florida 32399

or to such other address as may hereafter be provided by the

PERMIT NO. 132410479

parties in writing. Notices by registered or certified mail shall be deemed received on the delivery date indicated by the U.S. Postal Service on the return receipt.

ARTICLE XII. . VENUE

Any litigation hereunder shall be brought in the applicable state or federal court in Dade County or Leon County, Florida.

PERMIT NO. 132410160

RECEIVED
MAY 19 1961

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representative(s) on the latest day and year noted below.

FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

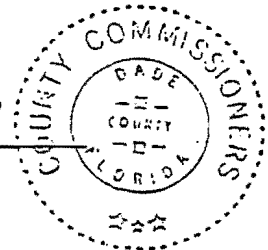
By: Virginia B. Wetherell 6/29/93
Virginia B. Wetherell Date
Secretary

METROPOLITAN DADE COUNTY

By: Joaquin G. Avino
Joaquin G. Avino Date
P.E., P.L.S.
County Manager

Attest:

Charles Avino
By: Deputy Clerk



Approved by County Attorney
as to form and legal sufficiency TM

PERMIT NO. 132416479

MAY 18 1994

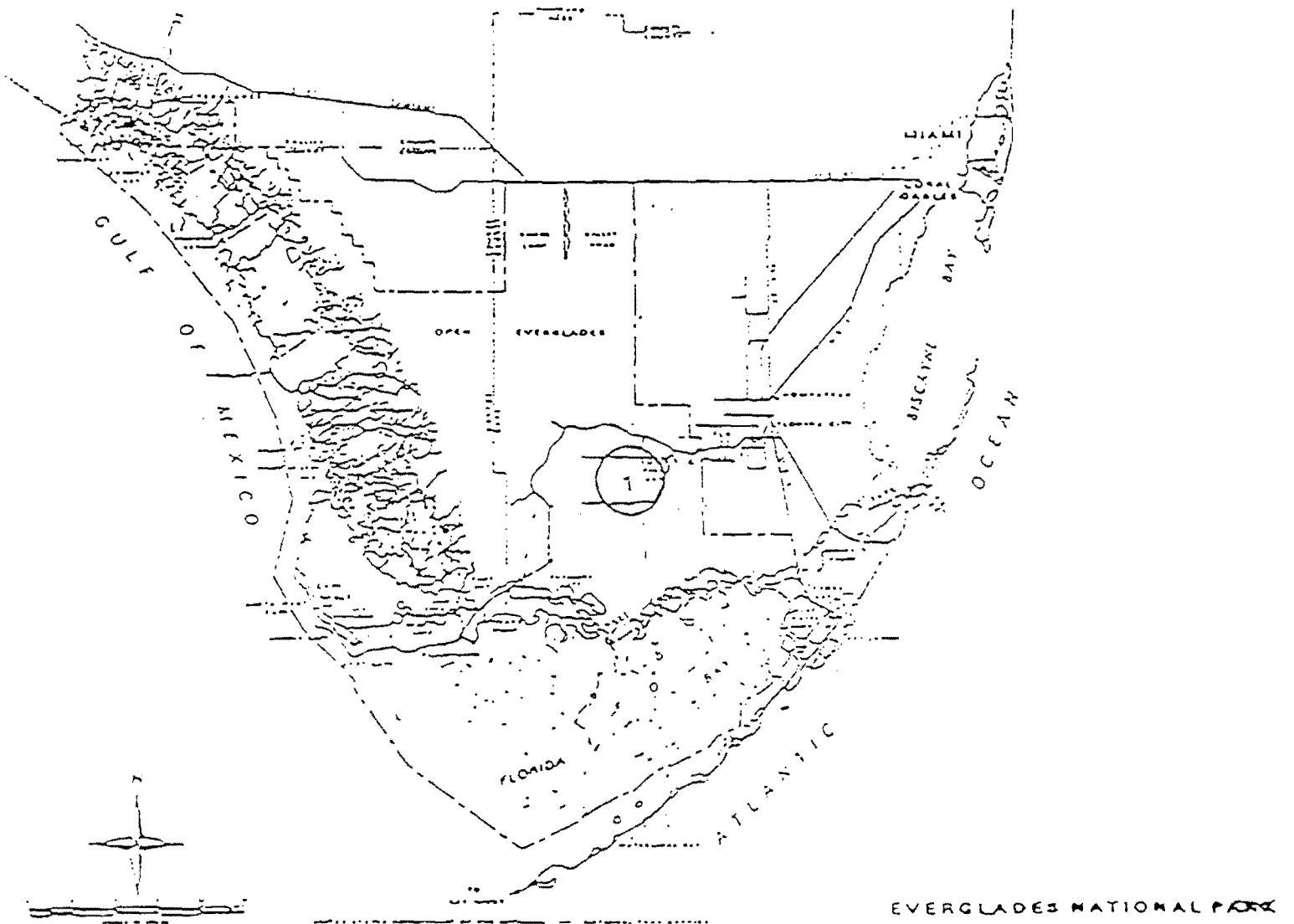
4/2/93

Figure 2. Map of southern Florida and Everglades National Park. Indicating the area of the Hole-in-the-Donut.

PERMIT NO. 1324108-3

RECEIVED
FBI
APR 2 1993

4/2/93



PERMIT NO. 132410479

RECEIVED
JUL 1993

4/2/93

Figure 3. Map of the Hole-in-the-Donut showing the location of the mitigation site.

PERMIT NO. 132410479

4/2/93

RA GRASS AREAS IN THE HOLE-IN-THE-DONUT,
SSO EVERGLADES NATIONAL PARK

- PAVED ROADS
- GRAVEL ROADS
- UNIMPROVED ROADS
- PINELANDS
- PRAIRIE GRASS (Spartina patens)
- WATER
- ABANDONED FARMLAND BOUNDARY
- WINDROWS IN BULLDOZED AREA
- LAWN AREAS

Donkey Center

Donkey Center

Boy Scout Camp

3

SCALE 1:2,000

Map Prepared by:
Rene Courney Balle
April 1994

Map Notes: PRAIRIE GRASS areas were identified on
5m x 5m color aerial photos (1:2,500).
PRAIRIE GRASS communities, pinelands, roads,
and windrows were then traced onto
map. The scale was then adjusted by a
factor of 2000.

PERMIT NO. 132416479

4/2/93

ENGINEERING SPECIFICATIONS

A. Topography and Control Sheets

Soil depths are to be taken on a 100 X 100 foot grid. Three depth measurements shall be taken at each sample site after vegetation removal, using a standard soil depth probe. Soil depth measurements shall be used to determine elevation changes after excavation.

A Topography and Control Sheet shall be done after substrate removal and final grading are completed in order to provide before and after substrate contours and profile. The second control sheet will have three inch (3") contour lines plotted on black and white aerial photography using a scale of one inch equals one hundred feet (1 inch = 100 feet). This contour map shall be produced using a minimum 20 foot control grid. Additional elevation 'shots' are to be taken within each 20 X 20 foot grid to capture all elevation changes ≥ 3 inches for individual topographic features greater than 3 ft² in extent. All topographic features smaller than 3 ft² in extent do not have to be included in the elevation survey. The Topography and Control Sheet will be a reproducible negative, and five blackline copies of the sheet will be provided in 'D' size format. An 'E' size format will be used for all sites where 'D' size format will not encompass the entire site at the indicated scale.

A registered overlay of the survey grid with all elevations at all surveyed points is to be provided at the same scale as the topography and control sheets. All surveys are to be performed and certified in writing by a surveyor licensed and insured in the State of Florida. All survey points are to be accurate ± 0.1 feet (± 0.3 cm) NGVD. Proof of State licensing and insurance shall be provided with bid package.

The following control items are to be represented on all Topography and Control Sheets:

- North Arrow
- Scale Bar (Scale ratios are NOT acceptable)
- UTM location for all photographic targets
- Survey grid: surveyed locations of all study plots, wells, equipment, survey corners of entire site, or other important features as determined by EVER
- Bench mark and UTM location and elevation for bench mark

B. Aerial Photography for Production of the Topography and Control Sheets

All aerial photographs are to be black and white. All aerial photographs are to be taken AFTER substrate removal. Flight height above the ground will be such that the negatives will have an average scale of one (1) inch equals one-hundred (100) feet. Negatives having a departure from the specified scale by more than 5% because of tilt or abrupt changes in flying altitude must be corrected. Ground control targets are to be set out within each site. A minimum of 5 targets are to be placed within each site, or if a site requires more than one photographic image to capture the entire area, then 5 targets are to be placed within each photographic frame. The targets are to be placed such that there is one at approximately each corner of the site (or frame) and one in the approximate middle of the site (or frame). The targets will be a minimum of one meter square (1 m²) with distinct alternate black and white checkerboard pattern. Each black area will be 0.5

APR 10 1993
FBI - TAMPA

Table 1

Date: _____

<u>Maximum number of mitigation credits available</u>	<u>Total number of mitigation credits released</u>	<u>Number of mitigation credits released since last report</u>	<u>Number of acres of wetlands restored to date</u>
---	--	--	---

PERMIT NO.

132410419

STATE OF FLORIDA
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

In Re:

Everglades National Park
c/o Mr. Robert Doren
Post Office Box 279
Homestead, Florida 33030

Permit No. 132416479

AGREEMENT FOR COVENANT RUNNING WITH LAND

In consideration of Everglades National Park's promises contained herein, and the Florida Department of Environmental Protection ("Department") acceptance of Everglades National Park's promise to enter into this agreement as part of the reasonable assurances provided by Everglades National Park in its application for the above designated permit, Everglades National Park and the Department agree as follows:

I. BACKGROUND

1. Everglades National Park has submitted to the Department an application for, and the Department has issued, Permit No. 132416479 (the "permit"), authorizing certain dredging and filling activities for the establishment of a mitigation bank in the Hole in the Donut section of Everglades National Park. The permit expires on _____. The terms and requirements of the permit are incorporated herein by reference.

II. MITIGATION REQUIREMENT AND ENFORCEABILITY

2. Specific permit conditions require the mitigation activities of the area described in Paragraph 1, which are located on certain land situated in Township 58 South and Range 36 East, Township 58 South and Range 37 East, Township 57 South and Range 38 East, and Township 58 South and Range 38 East, in Dade County, Florida, and which is more particularly described as follows:

(attach a legal description)

As required by Specific Condition No. 27 of the permit, Everglades National Park acknowledges and agrees that its obligation to perform the monitoring and mitigation required by the permit continues until the mitigation is determined to be

PERMIT NO. 132416479

successful (as described below), notwithstanding that the permit expires on _____.

3. This Agreement is enforceable as a contract or as an order of the Department.

III. DETERMINATION OF SUCCESS OF MITIGATION

4. The required mitigation will be determined to be successful when the requirements of Specific Condition No. 24 of the permit have been met. Specific Condition No. 24 provides:

24. The restoration work authorized by this permit shall be constructed in phases. Freshwater herbaceous wetland restoration within each phase shall be considered successful when all of the following criteria have been continuously met for a period of at least one growing season, without intervention in the form of irrigation, removal of undesirable vegetation, or replanting of desirable vegetation.

- a. Percent cover by non-nuisance, non-exotic wetland species shall be 80% or more. Percent cover for the aggregate of those wetland species, and of non-wetland species, bare ground and water shall be reported relative to the total area. A list of the wetland species included in the aggregate shall be included. Wetland species shall be those listed in Rule 62-340, F.A.C.;
- b. Nuisance species and exotic species are limited to 5% or less of the total cover;
- c. The restored herbaceous wetland has a similarity of 0.6 (as determined using Morisita's index) and 75% of the species richness of a mutually agreed upon undisturbed, control wetland (based on literature values, if possible). The control wetland shall be a good quality, freshwater, herbaceous wetland, characterized by a vegetative community that is typical of the type proposed to be restored;
- d. Not less than the total acreage of each parcel of freshwater herbaceous wetlands are determined by Department staff to be jurisdictional pursuant to Rule 62-340, F.A.C.; and
- e. The restored wetlands are constructed in accordance with the permit requirements.

5. Whenever Everglades National Park believes the mitigation is successful, Everglades National Park may notify the Department and afford Department personnel the opportunity to conduct an

PERMIT NO.

128416479

on-site inspection of the mitigation area. This notice shall be directed to Chief, Bureau of Submerged Lands and Environmental Resources and to the Office of General Counsel, both at the Department of Environmental Protection, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, and shall be by certified mail. Within one hundred twenty (120) days of receipt of this notice, the Department shall (1) notify Everglades National Park of the Department's determination that the mitigation has been successfully completed, or (2) notify Everglades National Park that the Department has determined the mitigation is not successful or cannot be determined to be successful, identifying specifically those elements of the mitigation that, in its judgment, have not been successful in accordance with applicable permit conditions, or the reasons why it is not possible to determine whether the mitigation is successful. Notification shall be in writing and by certified mail.

6. When the Department notifies Everglades National Park that the mitigation is successful, or, if the Department fails to notify Everglades National Park within the time period prescribed by this Agreement, then Everglades National Park's mitigation obligation under the terms of the permit and this Agreement shall be deemed satisfied.

7. Department personnel will be permitted to conduct an on-site inspection of the mitigation areas in a reasonable manner and at reasonable times.

8. If Everglades National Park fails to perform the required mitigation in accordance with the specified conditions of the permit within the time periods set forth in the permit, the Department (1) may inquire as to the status of the mitigation and require Everglades National Park to take appropriate remedial action, (2) may commence an enforcement action pursuant to Chapter 403, Florida Statutes, (3) may commence legal proceedings to enforce this Agreement, or (4) may extend the time allowed for the required mitigation in accordance with the specific conditions of the permit. In any such action or proceedings to enforce this agreement in which the Department prevails, Everglades National Park shall be liable for the Department's reasonable attorney's fees, costs and expert witness fees in both trial and appellate courts, and Everglades National Park consents that venue for such actions shall lie exclusively in Leon County, Florida.

9. Notwithstanding any of the above, the mitigation requirements of the permit may be modified by the Department if it determines that Everglades National Park has been unable to perform successfully the required mitigation based on causes beyond (Everglades National Park's) control. Such causes may include, but

PERMIT NO

198412403

are not limited to, unusual climatological and meteorological conditions.

10. Everglades National Park may request that this Agreement be modified for good cause. Good cause may include, but is not limited to, changes in dredging, filing or mitigation plans necessitated by or resulting from actions of federal, state or local governmental agencies. Requests for modification of this agreement shall be in writing and shall be served upon the Department in the same manner as provided in Paragraph No. 5 above. The Department shall have sole discretion to grant or deny such requests for modification.

11. The Department may require the Everglades National Park to publish in a newspaper of general circulation in Dade County, Florida, notice of any proposed modification of the mitigation requirements set forth in the permit or this Agreement. The text of such notice shall be supplied by the Department and shall be consistent with the provisions of Rule 17-103.150, Florida Administrative Code.

IV. REQUIRED AGREEMENT

12. This Agreement constitutes the agreement required by Specific Condition No. 27 of the permit.

V. RECORDATION AND RELEASE

13. Within thirty (30) days from the date of execution of this Agreement, Everglades National Park shall cause this Agreement to be recorded in the public records of each county wherein the affected lands are situated, and shall provide the Department with a copy of the recorded agreement certified by the Clerk of the Court.

14. Upon the satisfaction of the entire mitigation obligation under the terms of the permit and this Agreement, the Department shall execute a release in recordable form. If the Department determines that mitigation has been successful over part of the mitigation area, the Department may, at its discretion, execute a release for those portions which have attained success.

15. This agreement runs with the land and is binding upon Everglades National Park, its successors and assigns.

IN WITNESS WHEREOF, the Department and Everglades National Park set their hand and seal as follows:

PERMIT NO. 132416479

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

EVERGLADES NATIONAL PARK

Virginia B. Wetherell
Secretary

<Name>
<Title>

Dated _____, 1994

Dated _____, 1994

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before this _____
(date) by _____ (name of person acknowledging), who
is personally known to me or who has produced _____
(type of identification) as identification and who did (did not)
take an oath.

(SEAL)

Signature

Print Name

Title

Serial Number

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before this _____
(date) by _____ (name of person acknowledging), who
is personally known to me or who has produced _____
(type of identification) as identification and who did (did not)
take an oath.

PERMIT NC. 132416479

(SEAL)

Signature

Print Name

Title

Serial Number

This document was prepared by:

Name

Address

PERMIT NO. 132416479

Attachment V

Minimum Annual Mitigation Monitoring Requirements

Permit No. _____, [Permittee], Mitigation Site No. _____

Freshwater Herbaceous Wetland Restoration and Creation

Criterion to Monitor for	Year		
	1	2	3
Acreage of Jurisdiction	x	x	x
Desirable vegetation % cover	x	x	x
documented evidence*			
normal, healthy vegetative spread	x	x	
seedling establishment & survival	x	x	
Nuisance species % cover	x	x	x
Similarity #		x	x
Species richness #		x	x
Supplemental information	x	x	x

* For desirable species

As compared to the reference wetland

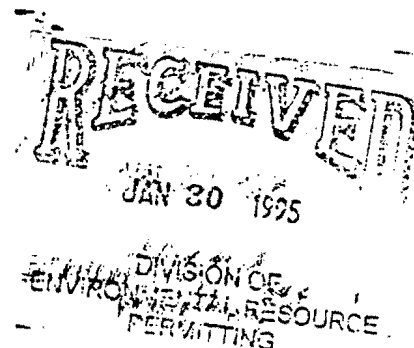
PERMIT NO. 192415456

Plant Community Types Vegetation Classification System for South Florida National Parks

Based on a review of several vegetation classification schemes developed by researchers of the Everglades National Park and Big Cypress National Preserve including a classification scheme devised by Craighead (1971), the following Vegetation Classification System was developed by the South Florida Research Center, National Park Service and the Center for Remote Sensing and Mapping Science (CRMS) at the University of Georgia for use in mapping the vegetation of Everglades National Park (EVER), Big Cypress National Preserve (BICY) and Biscayne National Park (BIS).

Plant Community Types

- I. Forest
- II. Scrubland
- III. Hammock
- IV. Savannah
- V. Exotics
- VI. Marsh
- VII. Swamp
- VIII. Prairie
- IX. Open water
- X. Additional Categories



Under these Plant Community Types are hierarchically arranged Plant Associations which are defined by typical dominant species. The species listed under the Plant Associations were compiled from South Florida Research Center Reports (1980-1983) for the Everglades and Big Cypress, Craighead (1971) and Davis and Ogden (1994). In order to indicate the degree of compatibility between this vegetation classification system and other existing systems, designations from the Florida Biological Diversity Project (FBDP) are indicated in parentheses. The designation, (?-FBDP) indicates no compatible FBDP category.

Plant Community Associations

I. FOREST - defined as areas dominated by trees greater than approximately 5 metres in height 0100-F

A. Buttonwood Forest 0110-BF

1. *Conocarpus erectus* (buttonwood)

PERMIT NO. 132410469

B. Mangrove Forest 0120-MF

1. *Rhizophora mangle* (red mangrove) 0121-RMF
2. *Avicennia germinans* (black mangrove) 0122-BMF
3. *Laguncularia racemosa* (white mangrove) 0123-WMF
4. Mixed mangrove 0124-MMF

RECEIVED
JAN 30 1995
DIVISION OF
ENVIRONMENTAL RESOURCES
PERMITTING

C. Pine Forest 0130-PF

1. *Pinus elliotti* var. *densa* (South Florida slash pine) with understory of palms including *Sabal palmetto* (cabbage palm), *Serenoa repens* (saw palmetto). [Typical of pinelands in BICY] 0131-PFp
2. *P. elliotti* var. *densa* with understory of hardwoods including *Rhus copallina* (southern sumac), *Myrica cerifera* (wax myrtle), *Myrsine* (red bay), *Ilex cassine* (dahoon) and forbs. [Typical of pinelands in EVER] 0132-PFhw

D. Hardwood Forest 0140-HWF

1. *Quercus virginiana* (live oak), *Q. laurifolia* (laurel oak), *Acer rubrum* (red maple), *Bursera simaruba* (gumbo-limbo) [Typical of BICY]

II. Scrubland- low density forest with tree height generally less than 5 metres 0200-SCR

A. Buttonwood scrub (Need to verify if this association exists) 0210-BSCR

B. Mangrove scrub 0220-MSCR

1. *Rhizophora mangle* (red mangrove) 0221-RMSCR

III. Hammock - Relatively small and self contained islands of hardwoods growing on slightly higher and drier soil in pine flatwoods, prairies or glades 0300-H

A. Tropical Hardwood Hammocks 0310-THH

1. *Lystroma latissiliquum* (wild tamarind), *Bursera simaruba*, *Quercus virginiana*, *Coccoloba diversifolia* (pigeon plum), *Nectandra coraicea* (lancewood)

B. Oak-Sabal Hammocks 0320-OSH

PERMIT NO. 132410469

1. *Quercus laurifolia* (laurel oak), *Sabal palmetto* (cabbage palm), with shrub understory of *Ficus aurea* (strangler fig), *Myrcianthes fragrans* (stopper), *Myrsine floridana* (myrsine), *Psychotria nervosa* (wild coffee)

C. Fan Palm Hammocks 0330-FPH

1. *Thrinax radiata* (tahtch palm), *Casasia clusiifolia* (seven-year apple), *Erithalis fruticosa* (black torch).

D. Buttonwood Hammocks 0340-BH

1. *Conocarpus erectus*, *Swietenia mahogoni* (mahogany/madeira), *Piscidia piscipula* (jamaica dogwood), *Bursera simaruba*, *Metopium toxiferum* (poisonwood), *Roystonea elata* (royal palm), *Sabal palmetto* (cabbage palm)

E. Sabal Palmetto Hammocks 0350-PH

1. *Sabal palmetto* (cabbage palm)

IV. Savannah - generally open tree canopy in moist, acid soil; coastal plain flatland, 0400-SAV

A. Palm Savannah 0410-PSAV

1. *Sabal palmetto* (cabbage palm), *Cladium jamaicense* (saw grass) and a variety of graminoids

B. Cypress Savannah 0420-CSAV

1. Dwarf Cypress Savannah - *Taxodium ascendens* (pond cypress), *Cladium jamaicense* (saw grass) and graminoids [Characteristic of cypress in EVER] 0421-dCSAV
2. Tall Cypress Savannah - *Taxodium ascendens/distichum* (pond/bald cypress), *Cladium jamaicense* (saw grass) and graminoids [Characteristic of cypress in BICY] 0422-tCSAV

V. **Exotics** - non-native species introduced to South Florida as ornamentals or wind breaks and now growing unchecked as nuisance or noxious plants. The following exotic plants are widespread in the Parks and have an established potential to invade and disrupt native plant communities. This makes them "Category I" exotics following the Exotic Pest Plant Council's (EPPC) classification. 0500-EX

PERMIT NO. 132416479

- A. *Melaleuca quirquenervia* (cajeput) 0510-MEX
- B. *Casuarina* spp. (Australian pine) 0520-CaEX
- C. *Colubrina asiatica* (lather leaf) 0530-CoEX
- D. *Shinus terebinthifolius* (Brazilian pepper) 0540-SEX
- E. *Ardisia elliptica* (= *A. solanacea*) 0550-AEX

VI. Marsh - low, flat, normally flooded areas of grasses, sedges and broad-leaved emergents 0600-M

- A. *Juncus roemerianus* Marsh (black rush) 0610-JM
- B. *Spartina* spp. Marsh (cordgrass) 0620-SM
- C. *Cladium jamaicense* Marsh (saw grass) 0630-CM
- D. *Muhlenbergia filipes* Marsh (hair grass) 0640-MM
- E. *Eleocharis cellulosa* Marsh (spike rush) 0650-EM
- F. Mixed Graminoids Marsh (Mixtures of these various grasses, sedges and rushes, e.g., "Cladium-Eleocharis Marsh" where Cladium is dominant over Eleocharis); can also include Utricularia spp. (bladderwort) 0660-MixM
- G. Broad-leaved Emergent Marsh 0670-BEM
 - 1. *Pontedaria lanceolata* (pickerel weed), *Sagittaria* spp. (arrowhead), *Typha* spp (cattail), *Nymphaea odorata* (white water lily)
- H. *Typha* spp. (cattail) 0680-TM

VII. Swamp - low, flat, normally flooded area dominated by trees 0700-S

- A. Hardwood, Mixed 0710-HS
 - 1. *Quercus laurifolia/virginiana* (laurel/live oak), *Acer rubrum* (red maple), *Persea borbonia* (red bay), *Annona glabra* (pond apple), *Fraxinis caroliniana* (pop ash) [Found in BICY]
- B. Cypress Swamp 0720-CS
 - 1. Cypress Strands - *Taxodium ascendens/distichum* (pond/hald cypress), understory of *Magnolia virginiana* (sweet bay), *Persea borbonia* (red bay),

PERMIT NO. 1324104

Chrysobalanus icaco (cocoplum), *Metopium toxiferum* (poisonwood), *Myrica cerifera* (wax myrtle), forbs 0721-CSS

2. Cypress Domes/Heads - [As above] 0722-Cd/hS

3. Cypress/Mixed Hardwood - *Taxodium ascendens/disticum* (pond/bald cypress), *Fraxinus caroliniana* (pop ash), *Acer rubrum* (red maple), *Annona glabra* (pond apple), *Sabal palmetto*, *Myrica cerifera* (wax myrtle), *Persea borbonia* (red bay) [This association occurs in BICY] 0723-CMHS

C. Bay Head 0730-BHS

1. *Magnolia virginiana* (Sect bay), *Metopium toxiferum* (poisonwood), *Acoelorrhaphe wrightii* (paurotis palm), *Persea borbonia* (red bay), *Annona glabra* (pond apple), *Cephalanthus occidentalis* (buttonbush), *Ilex cassine* (dahoon holly), *Myrica cerifera* (wax myrtle)

D. Willow Head 0740-WHS

1. *Salix caroliniana* (willow), *Thalia geniculata* (alligator flag), *Phragmites australis* (reed), *Annona glabra* (pond apple), encircled by *Cladium jamaicense* (sawgrass), *Ponteduria cordata* (pondweed) and other emergents

IX. Prairie - periodically flooded, usually moist, open grasslands 0800-P

A. Coastal Prairie - 0810-CP

1. *Juncus roemerianus* (black rush) 0811-JCP
2. *Cladium jamaicense* (sawgrass) 0812-CCP
3. *Muhlenbergia filipes* (hairgrass) 0813-MCP
4. Mixed Graminoids (Mixtures of these various grasses, sedges and rushes, e.g., "Cladium-Eleocharis Marsh" where *Cladium* is dominant over *Eleocharis*); can also include *Utricularia* spp. (bladderwort) 0814-MixCP

B. Dry Prairie 0820-DP

1. *Serenoa repens* (saw palmetto) [Jim Snyder of BICY needs to comment on this category] 0821-SDP

PERMIT NO.

1824-047

C. Halophytic Herbaceous Prairie -0830-HHP

1. *Distichlis spicata* (saltgrass), *Sporobolus* spp. (smutgrass) [Comprised mainly of graminoid monocots] 0831-DSHP
2. *Batis maritima* (saltwort), *Salicornia* spp. (glasswort), *Sesuvium* spp. (sea purslane) [Comprised mainly of succulent, shrubby dicots] 0832-BSHP

D. Pine Prairie 840-PP

1. *Pinus elliotti* var. *densa* (slash pine) interspersed with *Sabal palmetto*, *Serenoa repens*, and grasses/sedges such as *Cladium* and *Muhlenbergia* [This association occurs in the ecotone between pinelands and glades]

X. OPEN WATER 0900-WAT

- A. Lakes 0910-L
- B. Ponds 0920-P
- C. Rivers 0930-
- D. Streams 0940-
- E. Canals - (man-made) 0950-c
ditches 0951-d
- F. air boat trail 0960-ABT

XL ADDITIONAL CATEGORIES (Refer to Craighead (1971) "vegetation outline")
-1000

- A. Beaches - 1010-Bch
- B. Mud (Tidal) Flats 1020-Mud
- C. Florida Bay Keys Mangroves and Flats ??
- D. Exposed Rock (i.e., pinnacle rock) 1030-PR
- E. ATV trails 1040-ATV
- F. Brush 1050- Brush

SPECIAL MODIFIERS:

A. Density classes (5th digit)

1. low (0 - 25% trees)
2. medium (26% - 75% trees)
3. high (> 75% trees)

B. Hurricane Damage Classes for all canopy species (6th digit)

PERMIT NO. 132410469

1. >0% to 25% damage
2. 26% to 50% damage
3. 51% to 75% damage
4. 76% to 100% damage

References

These references were used in determining plant associations within community types and community type definitions:

Bell, C.R. and B.J. Taylor. 1982. Florida Wild Flowers. Laurel Hill Press, Chapel Hill, 308 pages.

Craighead, F.C. 1971. The Trees of South Florida. University of Miami Press Coral Gables, 212 pages.

Davis, S.M. and J.C. Ogden. 1994. Everglades: The Ecosystem and Its Restoration. St. Lucie Press, Delray Beach, 826 pages.

Duncan, W.H. and M.B. Duncan. 1988. Trees of the Southeastern United States. University of Georgia Press, Athens, 322 pages.

The majority of the Plant Associations were compiled from a summary report of all plant communities defined in vegetation studies from South Florida Research Center Reports during 1980 - 1983. This summary was compiled by Mr. David Jones of the Everglades National Park, South Florida Research Center.

PERMIT NC 132416479

Table 1

RELATIONSHIP OF MITIGATION ACTIONS AND RISK ADJUSTMENTS TO
MITIGATION ACTIONS

<u>Mitigation Action</u>	<u>Credit Ratio</u>	<u>Risk Adjustment</u>
Wetland creation via scrapedown	1:1	1.5 or 1.25 : 1
Wetland creation via reflooding	1:1	1.5 or 1.25 : 1
Enhancement of moderately impacted wetlands	5:1	1.1 : 1
Enhancement of minimally impacted wetlands	~~1:5~~	1.1 : 1
Preservation/enhancement of high quality wetlands	~~1:10~~	1.1 : 1

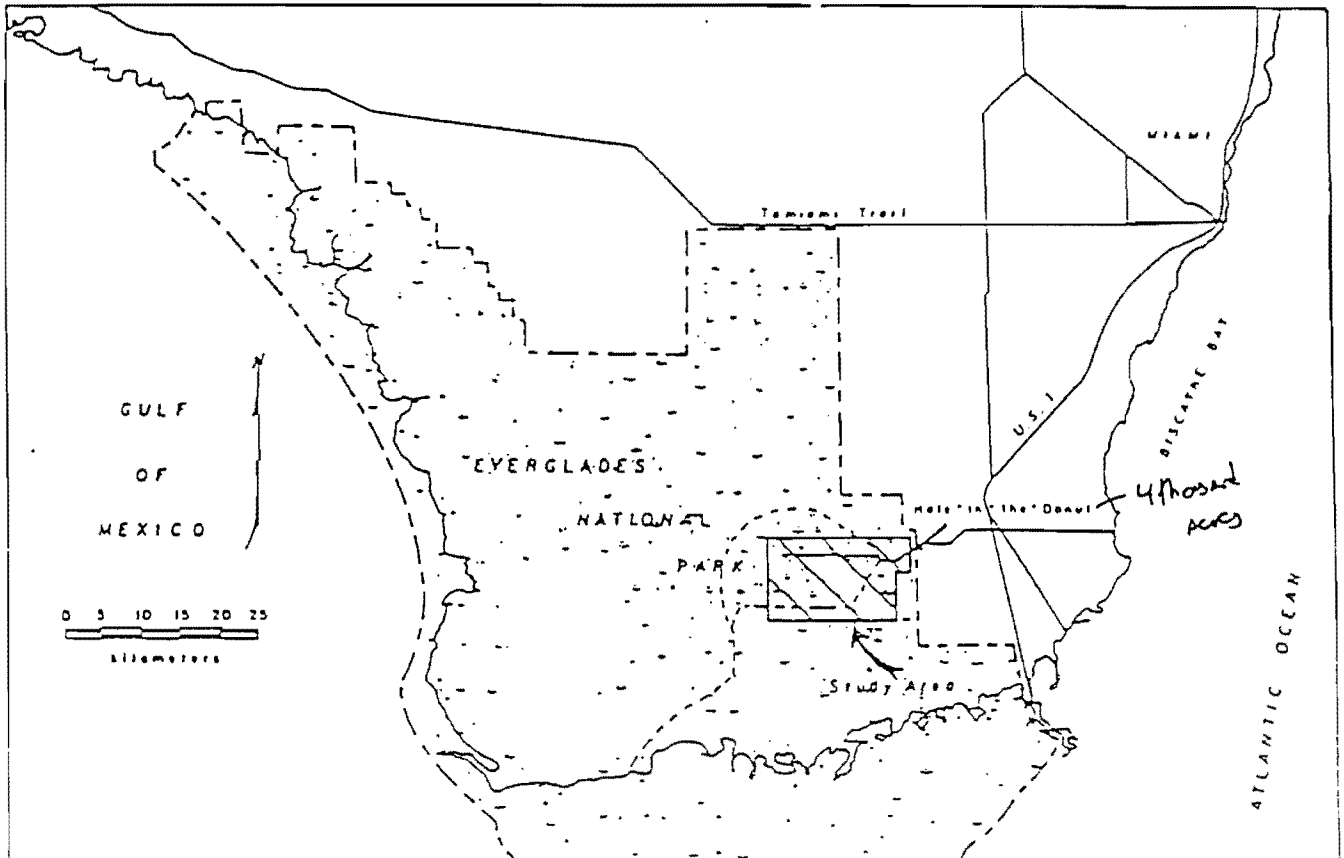
CONCEPTS AND CREDIT ANALYSIS

ERIC2

PERMIT NO. 132416479

(17)

ENP Hole-In-The-Donut



MODIFIED FROM KRAUSS (1987)

PERMIT NO 132416479

PAID
OFFICE OF THE

1847

THE UNIVERSITY OF CHICAGO

Table ni

PERMIT NO.

132416479

STATION NUMBER	PUBLISHED ORDER	FUND SOURCE	MITIGATION ACTIONS/CREDITS					FINANCEMENT				MITIGATION COSTS (\$ MIL.)	TOTAL COSTS (\$ MIL.)	
			CREATION			ACQUISITION		FINANCEMENT						
			CREDIT (1) RATIO	CREDIT (2) RATIO	CREDIT (3) RATIO	ACRES 50. MI.	CREDIT (4) RATIO	CREDIT (5) RATIO	RISK (6) ADJUST	RISK (7) ADJUST	RISK (8) ADJUST			
			100.0 50. MI.	1:1	1:1.25	1:1.5	201 0.31	1:9	1:10					
	1043 2.00	2.91	1642 2.57								2.6	3.03	1.74	4.21

this proposed credit ratio is based on 100% success of creation efforts.
 this proposed credit ratio is based on a risk adjustment of 25%.
 this proposed credit ratio is based on a risk adjustment of 50%.
 this proposed credit ratio is based on 100% success of enhancement efforts.
 this proposed credit ratio is based on a risk adjustment of 10%.
 this is the proposed sectional mitigation credit based on 100% success.
 this is the proposed sectional mitigation credit based on risk adjustment of 1.25 for creation and 1.1 for enhancement.
 this is the proposed sectional mitigation credit based on risk adjustment of 1.5 for creation and 1.1 for enhancement.
 this cost above hydrologic changes will be incorporated through raising canal stages and does not include earthwork.



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 15, 1996

Everglades National Park
c/o Mr. Robert Doren
Post Office Box 279
Homestead, Florida 33030

Dear Mr. Doren:

File No. 132416479, Dade County
Everglades National Park

Your request to modify this permit has been received and reviewed by Department staff. The modifications are to create up to six upland forest sites and restore up to eight borrow pits to long hydroperiod (8+ months) wetlands within the project area using excavated material instead of hauling the excavated material off-site or creating visitor outlooks.

This modification has been requested for several reasons. Complete on-site disposal of excavated material will result in significant cost savings to the permittee. Hauling excavated material off-site may cause unnecessary impacts to Everglades National Park infrastructure, tourists, and wildlife. Creating upland forest sites and restoring long hydroperiod wetlands will provide habitats that more closely mimic historic conditions at the Hole-in-the-Donut site. The elimination of the mounded over-looks does not constitute a negative impact, as the upland forest sites will provide relief similar to the original design, while providing greater restoration benefits.

The above changes are not expected to adversely affect water quality and will not be contrary to the public interest provided the following permit conditions are amended/added to the permit as issued (underlining indicates additions, ~~strikethroughs~~ indicate deletions):

PROJECT DESCRIPTION:

To restore approximately 6,250 ac. of wetlands within the Hole in the Donut area of Everglades National Park by removing exotic vegetation and excavating to limestone base; creating 3 upland mounded over-looks from former wetlands, totaling 10 ac. and using excavated material to create up to six upland forest sites and restore up to eight borrow pits to long hydroperiod wetlands

Notice of Permit Modification
Everglades National Park
File No.: 132416479
Page 2

within the project area to and disposing the remaining excavated material on uplands within the Frog pond, or other areas within the C-111 basin in coordination with U.S. Army Corps of Engineers. This restoration project will be managed as a mitigation bank for wetland impacts associated with projects within the Bird Drive and North Trails Basins.

SPECIFIC CONDITIONS:

12. Excavated materials may be temporarily stockpiled on-site pending removal to the approved disposal sites or placed on-site for construction of the three overlook mounds in accordance with the designs and in the locations indicated on Sheets 2 and 5 of the permit drawings of the upland forest sites and filling borrow pits in accordance with the designs indicated on the attached permit drawings.

13. [delete entire condition - replace with the following language]

All forested uplands to be constructed using the excavated material shall be on former wetlands. No existing wetland may be impacted for this work. Upon completion of grading the upland sites, they shall be planted with native vegetation and shall be maintained free of exotic plant species. The borrow pits shall be restored to a depth that will ensure an 8-month or longer hydroperiod. The borrow pits shall also be maintained free of exotic plant species.

15. ~~Off-site Disposal of the excavated materials shall occur in upland areas within the Frog Pond as indicated on Sheet 3 of~~ on-site in former wetland areas and borrow pits, as indicated on the attached permit drawings, within the proximal agricultural areas east of the C-111 canal, or within other upland areas in coordination with the U.S. Army Corps of Engineers Central and South Florida Project within the C-111 Basin. The proposed locations of specific spoil sites must be submitted to the Bureau of Submerged Lands and Environmental Resources Office of Intergovernmental Programs, Tallahassee, for review and approval prior to disposal.

Since the proposed modification with the above permit conditions is not expected to result in any adverse environmental impact or water quality degradation, the permit is hereby modified as requested. By copy of this letter and the attached drawings, we are notifying all necessary parties of the modification.

This letter of approval does not alter the February 15, 2015 expiration date, Specific or General Conditions, or monitoring requirements of the permit, except as indicated above. This letter and accompanying drawings must be attached to the original permit.

Notice of Permit Modification
Everglades National Park
File No.: 132416479
Page 3

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
- (d) A statement of the material facts disputed by petitioner, if any;
- (e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt

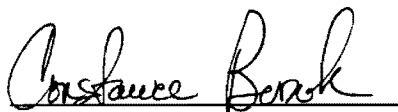
Notice of Permit Modification
Everglades National Park
File No.: 132416479
Page 4

of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,

A handwritten signature in cursive script, appearing to read "Constance Bersok", written over a horizontal line.

Constance J. Bersok
Environmental Administrator
Submerged Lands and Environmental
Resources Program

Notice of Permit Modification
Everglades National Park
File No.: 132416479
Page 5

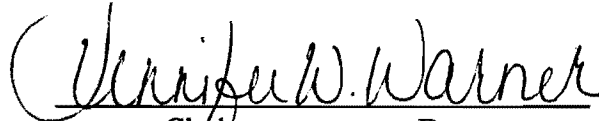
cc:

Marion Hedgepeth, DEP, Southeast District
Florida Game and Fresh Water Fish Commission
U. S. Army Corps of Engineers, Jacksonville
Silvia Morrell Alderman
Submerged Lands and Environmental Resources File

CERTIFIED MAIL NUMBER
RETURN RECEIPT REQUESTED

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.


Clerk Date 8/16/96

LONG PINE KEY / HOLE IN THE DONUT DISPOSAL SITE - Alternative 1

PIT	NAME	ACRES
B	Hayes Barn Road BP	1.4
C	Long Pine Key BP	1.5
D	Hidden Lake	8.0



0 1 inch - 1 Mile 4
Kilometers



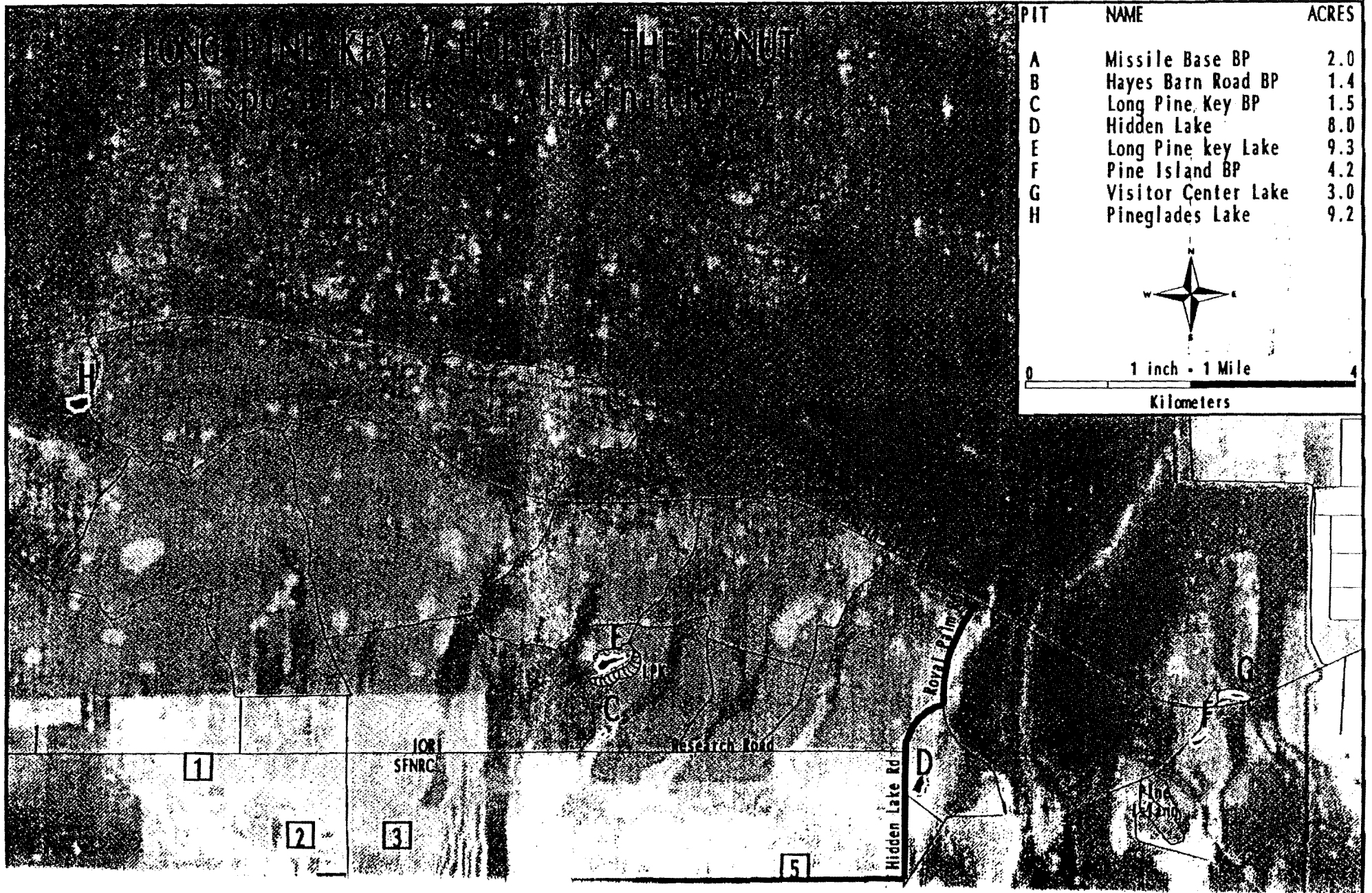
LONG PINE KEY, FLORIDA - IN THE DONUT

Disposal Site Alternatives

PIT	NAME	ACRES
A	Missile Base BP	2.0
B	Hayes Barn Road BP	1.4
C	Long Pine Key BP	1.5
D	Hidden Lake	8.0
E	Long Pine Key Lake	9.3
F	Pine Island BP	4.2
G	Visitor Center Lake	3.0
H	Pineglades Lake	9.2



0 1 inch = 1 Mile 4
Kilometers



Total volume in
sloped sides =
92,700yd³

Total volume
923'x923'x20'
central area =
632,000yd³

20 ft

60 ft

923 ft

Top of site = 1
acres

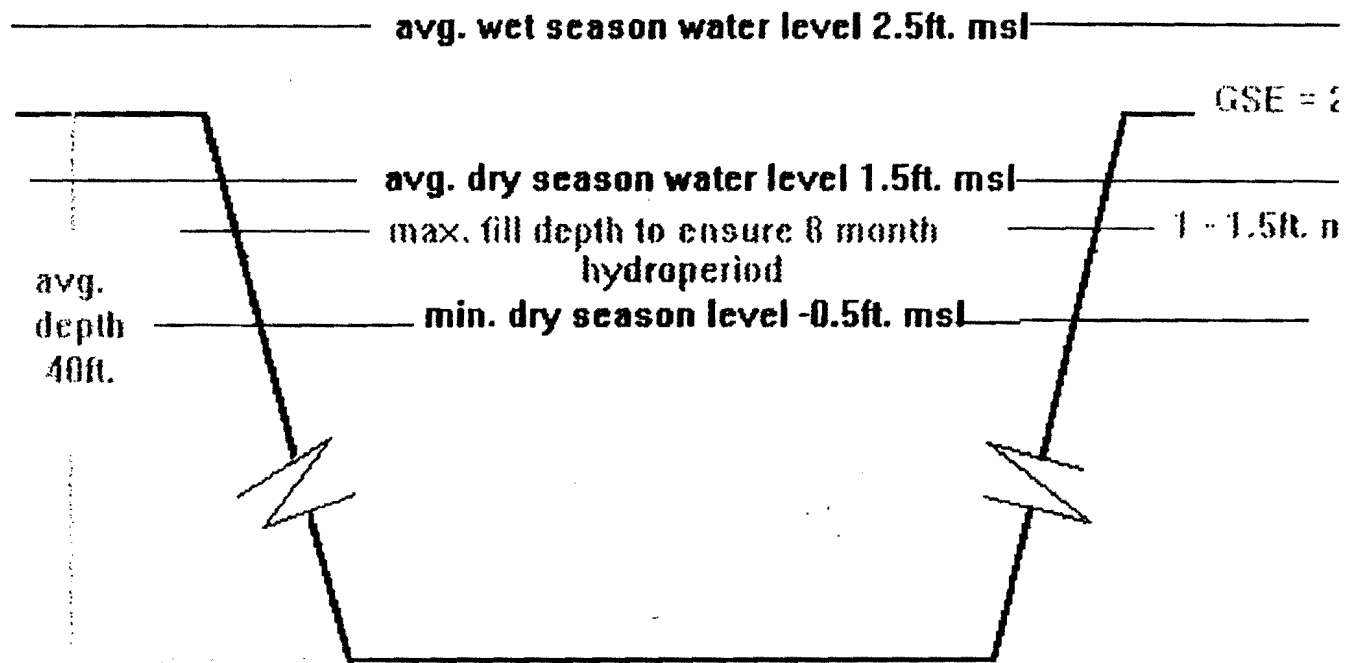
1040 ft

Base of site = 25
acres

Volume of entire
upland forest site
= 724,000yd³

Typical Borrow Pit Cross Section

GSE = Ground Surface Elevation



APPENDIX III

**ESTIMATED WETLANDS TRUST FUND SAVINGS THROUGH CONSTRUCTION
OF UPLAND FOREST SITES - HOLE-IN-THE-DONUT**

Cost Savings For Year One, Anticipated If All Soil Is Maintained Within Hole-In-The-Donut

South Florida Soil and Water Conservation District	\$70,000.00
Harden existing roadways in Park against heavy truck use	\$75,000.00
Law enforcement for road patrol during hauling operations	\$50,000.00
Purchase special speed limit signs for haul vehicle	\$1,200.00
Reduce hauling distance from 14.5 to 1.5 miles (estimated)	400,000 - \$600,000.00
Park impact minimization (estimated)	\$21,000.00
Total Savings Year One of Project (estimated)	<u>\$617,000 - \$817,200</u>

Estimated Per Year Savings Of Successive Years of Project \$1,234,400 - \$1,634,400

Estimated Savings Over The Life Of The Project \$24,688,000 - \$32,688,000