



New Directions In Planning, Design & Engineering

TURKEY POINT:

D-NORTH

D-MID

RED BARN

TEST COOLING CANAL BERMS

Time Zero/Baseline Monitoring Report
for the
November 2005 Monitoring Event

ACOE permit # SAJ-2004-813
Conditions of Certification PA 03-45

Prepared for:

Florida Power & Light
Turkey Point Facility
9700 SW 344th Street
Homestead, Florida 33035

Prepared by:

WilsonMiller, Inc.
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January 2005

Record #
18311

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LETTER OF TRANSMITTAL

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Project Name: Turkey Point

Ref: Quarterly Monitoring Report

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1			Turkey Point: D-North, D-Mid, Red barn, Test Cooling Canal berms First of Eight Quarterly Mitigation Monitoring Reports – Corps Permit # SAJ – 2004-813 and Power Plant Siting Act Conditions of Certification PA 03-45

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TABLE OF CONTENTS

1.	INTRODUCTION.....	1
2.	PROJECT LOCATION	1
3.	LICENSE/PERMIT INFORMATION.....	1
4.	SUCCESS CRITERIA	2
5.	VEGETATIVE ANALYSIS	2
6.	OBSERVED WILDLIFE UTILIZATION	4
7.	W.A.T.E.R. SCORES	4
8.	NEXT MONITORING REPORT.....	5
9.	SUMMARY.....	5
10.	DISCUSSION OF MONITORING RESULTS OVER TIME	6

APPENDICES

Appendix A Location Map

Appendix B Transect and Photo Station Map

Appendix C Vegetative Coverage, Plant Survivorship, and W.A.T.E.R. Tables

Appendix D Red Barn Planting List

Appendix E Observed Wildlife

Appendix F Photographs

Appendix G Monitoring Report Schedule

1. INTRODUCTION

The purpose of this monitoring program is to evaluate the success of the on-site wetland mitigation implemented to mitigate impacts due to the construction of Unit 5 at the Turkey Point power generation facility. This monitoring program was developed in accordance with Conditions of Certification XXIX, XXXVI.C.7, XXXVI.G, XXXVI.J, the Army Corps of Engineers (Corps) Permit SAJ-2004-813, and the approved Mitigation Plan. More specifically, the purpose is to verify site conditions and document the ecological trends of the mitigation and restoration sites toward the required success criteria.

This Time Zero/Baseline Monitoring report documents the conditions of Area D-Mid (west of transmission patrol road), Area D-North (west of transmission patrol road), Red Barn tree hammocks, and Ribs 3-5 of the Test Cooling Canal Berms. Please note that culverts were installed underneath the transmission road. Also, the planting on Ribs 1-2 of the Test Cooling Canal Berms was not complete in November at the time of the monitoring described in this report. The Time Zero monitoring for the Ribs 1-2 of the Test Cooling Canal Berms will be conducted in February at the same time as the next monitoring event for the areas described in this report.) Vegetative monitoring transects, water quality monitoring stations, and photo stations were established. A map showing the transect locations and photo stations is attached as Appendix B. Please refer to Appendix F for the photographs documenting site conditions. A functional assessment using Wetland Assessment Technique for Environmental Review (W.A.T.E.R.) was executed where required.

2. PROJECT LOCATION

The project is located adjacent to Biscayne Bay immediately north and west of the existing Turkey Point Power Plant in Section 27 and 28, Township 57s, Range 40E in Florida City, Dade County, Florida. Latitude - 25°26'09" North. Longitude - 80°19'52" West. Refer to Appendix A (Location Map) for site location and Appendix B for site configuration.

3. LICENSE/PERMIT INFORMATION

The Army Corps of Engineers has issued permit SAJ-2004-813 for activities associated with construction at the Turkey Point Expansion Project and associated mitigation activities. The Turkey Point Expansion Project and mitigation activities are also authorized under the Power Plant Siting Act, Conditions of Certification PA 03-45.

4. SUCCESS CRITERIA

Success criteria specified in the Corps permit and in Certification PA 03-45 are for the most part assessed 2, 3, or 5 years after implementation of the mitigation activity or they require documentation of changes in the mitigation areas through time. As a result, most of the success criteria will be discussed at the appropriate time in subsequent monitoring reports.

One criterion that characterizes the ongoing health status of the mitigation areas relates to aerial coverage of exotic or nuisance vegetation. Success is achieved if invasive exotic vegetation is controlled to below 1% aerial coverage in the monitored areas (Condition of Certification XXXVI.G. As a result, this criterion will be addressed in each monitoring report.

5. VEGETATIVE ANALYSIS

General

During the monitoring session, information was collected concerning species composition, percent coverage, and relative health of vegetation. Transects were established to evaluate the full range of existing water depths, vegetation interfaces, topographic gradients, and other environmental variants. The end points of each sampling transect were established with rebar and sleeved in PVC for durability and ease of location in subsequent monitoring efforts. To monitor vegetative re-colonization, 3 sampling stations with a radius of 5' were established at the mid and end points of each transect. This mid-point sampling station was also established with rebar and sleeved with a PVC stake. All PVC stakes were labeled with a permanent marker, identified with a scratched metal dog tag, and located with hand-held GPS. These transect and sampling station locations shall remain permanent throughout the monitoring period. Refer to the Appendix B for transect and sample station locations. Vegetative sampling at each sampling station was performed to document species-specific percent cover of recruited species, percent cover by planted species, percent cover by exotic and nuisance species, and indications of plant reproduction.

Area D-Mid & Area D-North

A total of 10 non-overlapping transects (three in D-North and seven in D-Mid) were established to effectively represent vegetative community conditions within both areas, as described above. Sampling stations were used to quantify the vegetative cover along each transect as described above. Permanent, fixed photo stations were set at one end of each transect, oriented facing the opposite transect end. Additionally, a functional analysis was performed in each area using W.A.T.E.R. Area D Mid achieved a W.A.T.E.R. score of 0.65 (76% of success criteria of 0.86); Area D North achieved a W.A.T.E.R. score of 0.67 (78% of success criteria of 0.86). Please refer to Appendix C for the results of the vegetation sampling and W.A.T.E.R. analyses.

Test Cooling Canal Berms

During clearing and grading of Ribs 3, 4, and 5, the mangrove fringe on each Rib was preserved, and is visible in the photos in Appendix F. The Mitigation Plan did not require preservation of the mangrove fringe, therefore, the mangrove fringe was not included as part of the baseline monitoring. However, the removal of Australian pines that previously shaded the mangroves will undoubtedly enhance the ability of the mangrove fringe to function and provide habitat support for the adjacent cooling canals and reconstructed portions of the ribs. The presence of mangroves is accounted for in Section 2f of the W.A.T.E.R. analysis.

Within the graded surface of each Rib, a total of 10 non-overlapping transects (two on Rib #5, four on Rib #4, and four on Rib #3) were established to effectively represent vegetative community conditions. Sampling stations were used to quantify the vegetative cover along each transect, as described above. Though not specifically included in the monitoring transects, several piles of vegetative debris, generated during exotic vegetation eradication on Rib #5, were left in order to increase habitat diversity, specifically for the Eastern Indigo snake. The initial supplemental planting on Ribs #1 and #2 of the Test Cooling Canals had not yet occurred at the time of monitoring. As a result, these Ribs were not monitored. They will be incorporated into the monitoring events once planting is complete. Ribs #1 and #2 have been graded to plan and initial planting will be complete prior to the first quarterly monitoring event. Initial planting of these two Ribs has been delayed due to disruption in local nursery plant stock availability due to Hurricanes Katrina, Rita, and Wilma in August, September, and October, 2005, respectively. Permanent fixed photo stations were set at one end of each transect, facing the opposite transect end. W.A.T.E.R. scores were assessed collectively for Ribs #3 and #4 (wetland), and Ribs #3, #4, and #5 (upland). Ribs #3 & #4 wetland achieved a W.A.T.E.R. score of 0.38 (84% of success criteria of 0.45); Ribs #3, #4 & #5 upland achieved a W.A.T.E.R. score of 0.46 (>100% of success criteria of 0.25). Please refer to Appendix C for W.A.T.E.R. results.

Resprouting Australian pine and the mikania (vine) observed on the ribs should be eradicated prior to the next monitoring event. Observed exotics were less than 1% of coverage.

Red Barn (Upland Hammocks)

A total of 2 non-overlapping transects (one in the north hammock, and one in the middle hammock) were placed to effectively represent vegetative community conditions in the planted hammock. Three sampling stations were installed along each transect to quantify species-specific vegetative coverage. To quantify vegetation growth through time, five shrubs and five trees per transect were tagged with pink-and-black striped tape, along with lime green tape and heights were measured. To assess plant survivorship, 8' wide belt transects were conducted along each transect alignment. Trees and shrubs that occurred within the belt transects were tagged with pink-and-black stripe tape only, and recorded as alive or dead. Permanent, fixed photo stations were set at one end of each transect, facing the opposite transect end. Please

refer to Appendix C for baseline coverage, survivorship and growth results. At the time of this writing, survivorship within the transects is 100%.

In August, 2005, the three hammocks in the Red Barn mitigation area were planted with 4,023 shrubs and trees. The species, sizes, and quantities planted are itemized in Appendix D. Later, on September 22, 2005, planted trees and shrubs that died as a result of hurricane damage were replaced species for species. With the passing of Hurricane Wilma, pine straw mulch was augmented and trees and shrubs that blew over in the storm were erected. No replanting occurred at that time.

The cypressvine observed in the hammocks should be eradicated prior to the next monitoring effort. Observed exotics were less than 1% of coverage.

6. OBSERVED WILDLIFE UTILIZATION

Two individual groups of approximately 50 wood storks (*Mycteria americana*) were observed on the project site. One group was observed in Area D-Mid, and the other group was utilizing the northern portion of Rib #4 around a crocodile pond. A group of 12 white ibis (*Eudocimus albus*) was also observed around this crocodile pond. Crocodilian tracks and scat were observed on the Test Cooling Canal Berms. American Crocodiles (*Crocodylus acutus*) are known to displace American alligators (*Alligator mississippiensis*) that occur in the same area. Additionally, through regular monitoring by FPL staff, there is extensive documented evidence over many years of crocodiles being present in the cooling canals located immediately south of the test cooling canal ribs. Therefore, it is a reasonable conclusion that the tracks and scat were from a crocodile and not an alligator. One little blue heron (*Egretta caerulea*) and one tricolor heron (*Egretta tricolor*) were observed on Rib #3. Several species of fish and invertebrates were observed utilizing Areas D-North and D-Mid, along with the Test Cooling Canal Berms. A table of all wildlife species observed foraging in, or utilizing, the monitored areas is included in Appendix E.

7. W.A.T.E.R. SCORES

W.A.T.E.R. scores were evaluated for Areas D-Mid, D-North, and the Test Cooling Canal Berms (Ribs #3 & #4 (wetland) and Ribs #3, #4, and #5 (upland)). These areas were assessed one score per mitigation area, not per transect or sample station. Water quality is one of the several parameters measured in the W.A.T.E.R. analysis. Based upon the scoring criteria for this parameter, it suggests that in order to achieve a mid to high water quality score, water samples would need to be quantitatively analyzed and compared against state water quality standards. Since there is little reason to expect that the site has any potential to have elevated levels of compounds regulated by state standards (i.e., pesticides, herbicides, fecal coliforms, etc.), due to the lack of adjacent pollution-prone land uses, it was determined that measurement of salinity and turbidity was sufficient for water quality analysis. A VISTA A366ATC hand held

refractometer and a LaMotte Model 2008 meter were used to measure salinity and turbidity, respectively. Please refer to Appendix C for results of the W.A.T.E.R. analysis.

In March 2005, prior to installation of culverts under the access road flanking the eastern limits of D-North and D-Mid, salinity samples were taken from one location in D-Mid (D-1) and two locations in D-North (D-2 and D-3) to serve as a baseline for post-culvert-installation salinity comparison. Refer to Appendix B for salinity sample locations and Appendix C for baseline salinity results.

8. NEXT MONITORING REPORT

The first quarterly monitoring event for Turkey Point: D-North, D-Mid, Red Barn, and Test Cooling Canal Ribs will be in February 2006, and the report will be generated and submitted in March 2006. The report will include a brief description of the work completed since November 2005, if any, and work anticipated for the next period, if any, in addition to the monitoring data. Observations will be noted from sampling locations and will include, as appropriate, an approximate number of plants surviving from the initial planting, additional plants planted, and expectations of survivorship trends. The report will include photographs documenting site conditions, taken from the same permanent photo stations. Refer to Appendix G for a schedule of forthcoming monitoring events/reports.

9. SUMMARY

The purpose of this monitoring program is to evaluate the success of the on-site wetland mitigation implemented to mitigate impacts due to the construction of Unit 5 at the Turkey Point power generation facility. More specifically, the purpose is to verify site conditions and document the ecological trends of the mitigation and restoration sites toward the required success criteria.

During the monitoring session, information was collected concerning species composition, percent coverage, and relative health of vegetation. The project site is healthy overall. The areas that exhibited very little plant coverage were areas that have very recently been created. The Test Cooling Canal Ribs 3-5 have not had sufficient time for visible natural recruitment. Test Cooling Canal Ribs 1 & 2 initial plantings were delayed due to disruption in local nursery plant stock availability due to Hurricanes Katrina, Rita, and Wilma in August, September, and October, 2005, respectively. Vegetative coverage is expected to increase through time and meet the success criteria. A group of approximately 50 wood storks were observed utilizing the ribs, along with other species such as the endangered American crocodile. The Red Barn Hammock plantings appeared healthy and are expected to survive and increase in size over the monitoring period. Areas D-Mid and D-North are healthy red mangrove habitat, which contained numerous species of mammals, birds, reptiles, fish, and invertebrates. Natural hydrology has

been restored to the area with the installation of culverts under the access road that borders the area. A group of approximately 50 wood storks were observed utilizing Area D-Mid.

Where appropriate, W.A.T.E.R. scores were assessed to each area to determine success. Areas D-North, D-Mid, and Test Cooling Canal Ribs 3 & 4 (wetland) received scores of 0.67, 0.65, and 0.38, respectively. Although these scores do not meet the success criteria, they fall within 75-85% achievement. Test Cooling Canal Ribs 3, 4, & 5 (upland) received a W.A.T.E.R. score of 0.46, which is 184% of the success criteria. This score is anticipated to increase further as natural recruitment progresses.

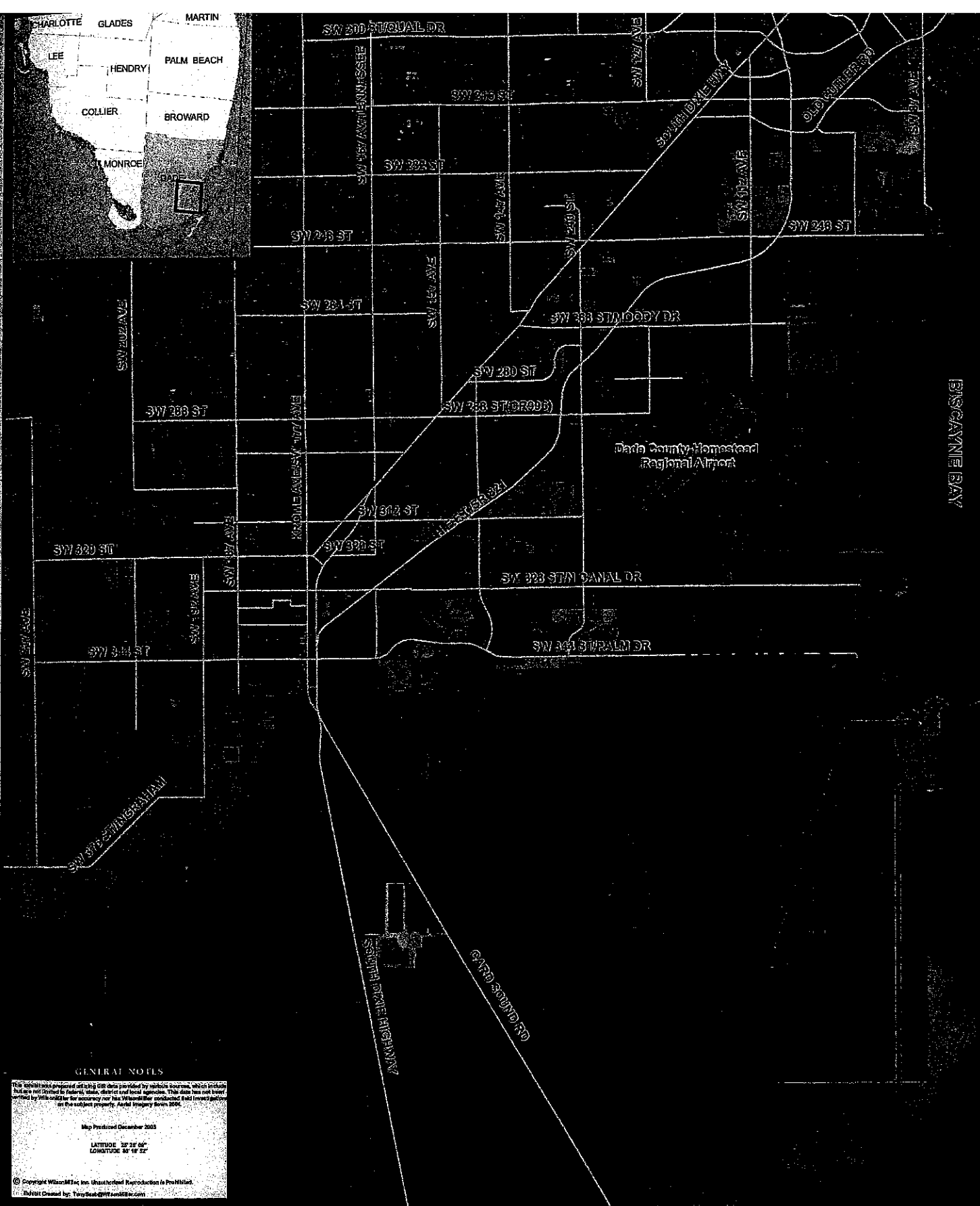
The next monitoring event is scheduled for February, 2006.

10. DISCUSSION OF MONITORING RESULTS OVER TIME

This section will be used in future reports to discuss current monitoring results in relation to previous results, with the goal of continued progress toward achieving the success criteria.

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix A Location Map



GENERAL NOTES

This information was prepared using data provided by various sources, which include but are not limited to aerial photography, maps, and field surveys. This data has not been verified by WilsonMiller for accuracy nor has WilsonMiller conducted field investigation on the subject property. Aerial Imagery from 2004.

Map Prepared December 2003

LATITUDE: 25° 27' 00"
LONGITUDE: 80° 18' 00"

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Editorial Created by: Tony Seab@WilsonMiller.com



0 0.5 1 Miles

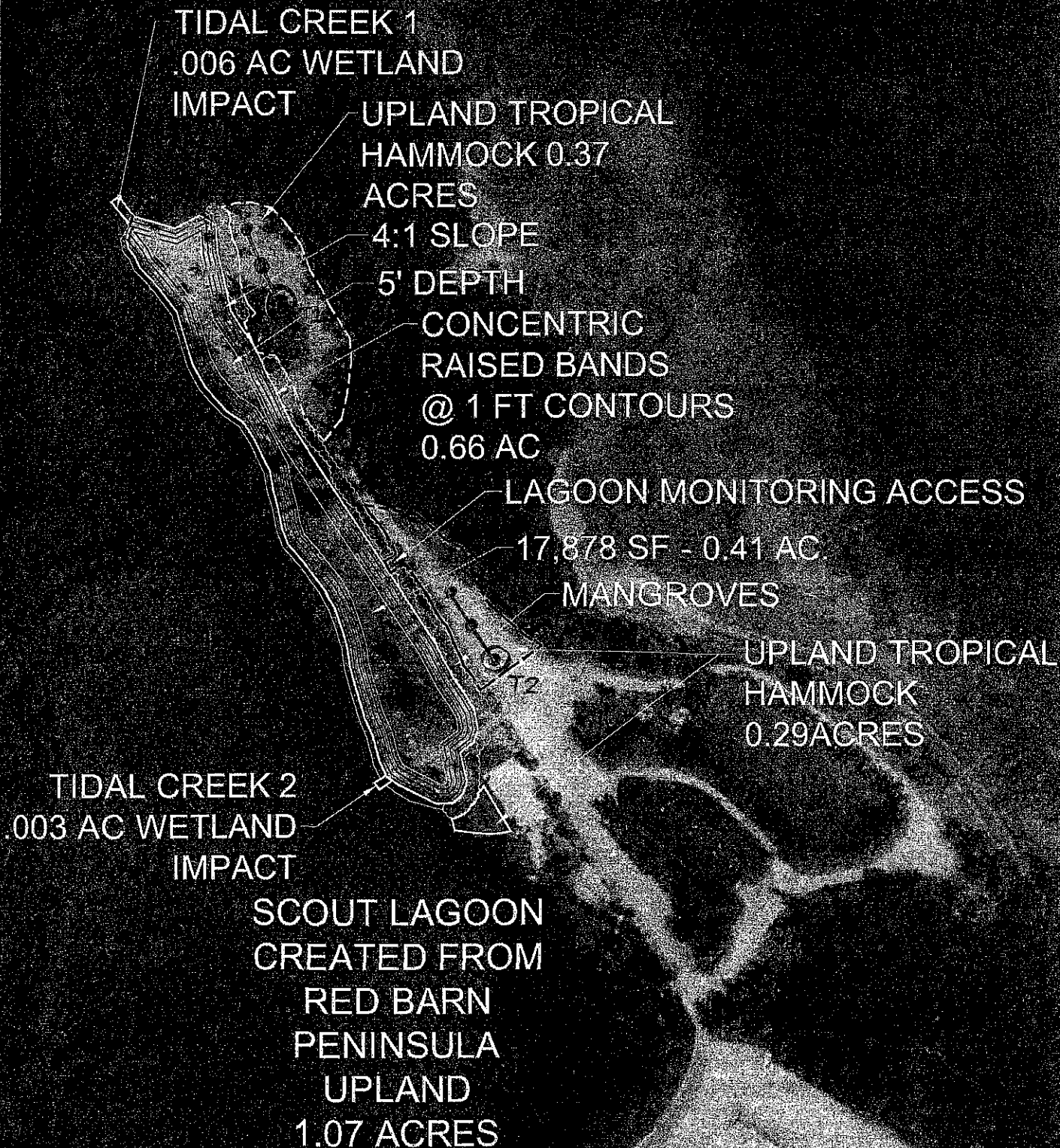
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Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix B Transect, Photo Station, and Sample Location Map



Turkey Point Expansion

Scout Lagoon's & Tidal Creek Connection &
Tropical Hammock Planting Area

DATE: 10-15-04

NOT TO SCALE



North



**Cotleur
Hearing**

1934 Commerce Lane
Suite 1
Jupiter, Florida 33458
888-747-6336 Fax: 747-1377

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix C Vegetative Coverage, Plant Survivorship, and W.A.T.E.R. Tables

AREA D-MID

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
Red Mangrove	62.6%							
White Mangrove	0.1%							
Midstory spp.								
	0.0%							
Groundcover spp.								
Needle Rush	0.3%							
Exotic/Nuisance spp.								
	0.0%							

Notes:

- 1) There was no supplementary planting in this area.
- 2) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 3) Species coverage represents mean of all sample stations in mitigation area.
- 4) Baseline salinities in D-Mid collected on March 11, 2005 were 33 ppt and 22 ppt (samples D2 & D3, respectively).

Success criteria: 0.86

W.A.T.E.R. Score
Percent Complete

	W.A.T.E.R.							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
W.A.T.E.R. Score	0.65							
Percent Complete	76							

AREA D-NORTH

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
Red Mangrove	53.9%							
White Mangrove	2.8%							
Midstory spp.								
	0.0%							
Groundcover spp.								
Needle Rush	1.9%							
Exotic/Nuisance spp.								
	0.0%							

Notes:

- 1) There was no supplementary planting in this area.
- 2) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 3) Species coverage represents mean of all sample stations in mitigation area.
- 4) Baseline salinity in D-North collected on March 11, 2005 was 31 ppt (sample D1).

Success Criteria: 0.86

W.A.T.E.R. Score
Percent Complete

W.A.T.E.R.							
Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
0.67							
78							

COOLING CANALS RIBS #1 & #2 (wetland)

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
Green Buttonwood	N/A							
Dahoon Holly	N/A							
Pond Apple	N/A							
White Mangrove	N/A							
Red Mangrove	N/A							
Midstory spp.								
Wax Myrtle	N/A							
Coco Plum	N/A							
Buttonbush	N/A							
Groundcover spp.								
	N/A							
Exotic/Nuisance spp.								
	N/A							

Notes:

- 1) Supplementary planting in this area has not yet occurred.
- 2) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 3) Species coverage represents mean of all sample stations in mitigation area.
- 4) Initial planting was delayed due to disruption in local nursery plant stock availability due to Hurricanes Katrina, Rita, and Wilma.

Success Criteria: 0.75

W.A.T.E.R. Score
Percent Complete

	W.A.T.E.R.							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
W.A.T.E.R. Score	N/A							
Percent Complete	N/A							

COOLING CANALS RIBS #3 & #4 (wetland)

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
	0.0%							
Midstory spp.								
	0.0%							
Groundcover spp.								
<i>Chara</i> spp.	0.3%							
Exotic/Nuisance spp.								
	0.0%							

Notes:

- 1) There was no supplementary planting in this area.
- 2) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 3) Species coverage represents mean of all sample stations in mitigation area.

Success Criteria: 0.45

W.A.T.E.R. Score
Percent Complete

W.A.T.E.R.							
Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
0.38							
84							

COOLING CANALS RIBS #3, #4, & #5 (upland)

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
	0.0%							
Midstory spp.								
Green Buttonwood	0.2%							
Groundcover spp.								
Eustaches spp.	0.1%							
Scorpion tail	0.1%							
Exotic/Nuisance spp.								
Mikania	0.1%							
Australian pine	0.1%							

Notes:

- 1) There was no supplementary planting in this area.
- 2) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 3) Species coverage represents mean of all sample stations in mitigation area.

Success Criteria: 0.45

W.A.T.E.R. Score
Percent Complete

	W.A.T.E.R.							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
W.A.T.E.R. Score	0.46							
Percent Complete	184							

RED BARN HAMMOCKS

SPECIES BY STRATUM	PERCENT COVERAGE							
	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Canopy spp.								
Silver Buttonwood	5.3%							
Gumbo Limbo	0.7%							
Red Bay	1.2%							
Pigeon Plum	1.2%							
Seagrape	5.2%							
Midstory spp.								
White Stopper	3.0%							
Red Stopper	0.2%							
Wax Myrtle	1.2%							
Myrsine	1.0%							
Firebush	2.0%							
Groundcover spp.								
Bay Cedar	1.5%							
Necklacepod	0.5%							
Beggarweed	0.2%							
Saw Palmetto	0.7%							
Exotic/Nuisance spp.								
Cypressvine	0.2%							

Notes:

- 1) Stratum based upon anticipated species size at maturity and not species size at time of monitoring.
- 2) Species coverage represents mean of all sample stations in mitigation area.

RED BARN HAMMOCKS TREE SURVIVORSHIP

	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Transect #1 (count)	28							
Transect #2 (count)	49							
Total (count)	77							
% Survivorship	100%							

RED BARN HAMMOCKS PLANT GROWTH

	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Average Tree Height (in.)	116.6							
Average Shrub Height (in.)	23.1							

Note:

Averages based upon 10 trees and 10 shrubs.

Trees and shrubs tagged for repeated measurement.

COOLING CANALS RIBS 1 & 2 (wetland) PLANT SURVIVORSHIP

	Nov. 05	Feb. 06	May. 06	Aug. 06	Nov. 06	Feb. 07	May. 07	Aug. 07
Transect #1 (count)	N/A							
Transect #2 (count)	N/A							
Total (count)	N/A							
% Survivorship	N/A							

Note:

Initial planting is pending.

Mitigation Bank Wetland Function Evaluation Matrix

W.A.T.E.R. - Wetland Assessment Technique for Environmental Reviews

Based on WBI, WQI, WRAP, HGM and 4th Priority Project List (PPL) with technical advice from EPA, FDEP, ACOE, NMFS, USF & W, SFWMD & Dade County

Project: FPL - Turkey Point

Reviewer: Justin Styer and Josh Houser

Date:

			Polygon	Polygon	Polygon	Polygon	Polygon
			D-North	D-Mid	Cooling Canals, Ribs 3, 4, 5 - upland	Cooling Canals, Ribs 1 & 2 - wetland	Cooling Canals, Ribs 3 & 4 - wetland
1. Fish & Wildlife Functions Apply to freshwater, saltwater, brackish and mitigation systems							
a. Waterfowl, wading birds, wetland dependent, or aquatic birds of prey. (Mit. Bank - High specie count w/ low pop. #'s score 1)	7 or more species commonly observed	3	1	1	3	*	1
	3-6 species commonly observed	2					
	1-2 species commonly observed	1					
	0 species commonly observed	0					
b. Fish (Mit. Bank - High specie count w/ low pop. #'s score 1) Restoration that causes 12% pop. Increases-higher score)	7 or more species commonly observed	3	2	2	N/A		0
	3-6 species commonly observed	2					
	1-2 species commonly observed	1					
	0 species commonly observed	0					
c. Mammals (Mit. Bank - High specie count w/ low pop. #'s score 1) Restoration that causes 12% pop. Increases-higher score)	Top predator (carnivore) &/or large mammals	3	2	2	2	*	0
	Medium sized mammals, (adult weight > 6 lbs.)	2					
	Small animals (rodents, etc.), (adult weight < 6 lbs.)	1					
	0 species present	0					
d. Aquatic macroinvertebrates, amphibians (Mit. Bank - High specie count w/ low pop. #'s score 1) Restoration that causes 12% pop. Increases-higher score)	7 or more species commonly observed	3	1	1	0	*	1
	3-6 species commonly observed	2					
	1-2 species commonly observed	1					
	0 species commonly observed	0					
e. Aquatic reptiles (Mit. Bank - High specie count w/ low pop. #'s score 1) Restoration that causes 12% pop. Increases-higher score)	Large species observed	3	3	3	3	*	3
	Aquatic turtles	2					
	Snakes & lizards	1					
	No evidence of species present	0					

* = Planting incomplete, so W.A.T.E.R. not executed.

Mitigation Bank Wetland Function Evaluation Matrix

W.A.T.E.R. - Wetland Assessment Technique for Environmental Reviews

Based on WBI, WQI, WRAP, HGM and 4th Priority Project List (PPL) with technical advice from EPA, FDEP, ACOE, NMFS, USF & W, SFWMD & Dade County

Project: FPL - Turkey Point

Reviewer: Justin Styer and Josh Houser

Date:

			Polygon	Polygon	Polygon	Polygon	Polygon
			D-North	D-Mid	Cooling Canals, Ribs 3, 4, 5 - upland	Cooling Canals, Ribs 1 & 2 - wetland	Cooling Canals, Ribs 3 & 4 - wetland
2. Vegetative Functions Apply to freshwater, saltwater, brackish and mitigation systems							
a. Overstory/shrub canopy	Desirable trees/shrub healthy & providing appropriate habitat (seedlings present) & no inappropriate species	3	3	3	N/A	*	N/A
	Desirable trees/shrubs exhibit signs of stress (no seedlings) few inappropriate species present	2					
	Inappropriate trees/shrubs shading or overcoming desirable tree/shrubs	1					
	Very little or no desirable tree/shrubs present (evidence suggests there should be)	0					
b. Vegetative ground cover	Assessment area exhibits <2% inappropriate herbaceous ground cover for specific wetland systems and groundcover is present	3	2	2	0	*	N/A
	Assessment area contains >2% but <30% inappropriate herbaceous groundcover, or lack of groundcover >2% but < 30%	2					
	Assessment area contains >30% to <70% inappropriate herbaceous groundcover, or lack of ground cover >30% to <70%	1					
	Assessment area >70% inappropriate herbaceous groundcover or lack of groundcover >70%	0					
c. Periphyton mat coverage	Periphyton (Blue-green algae) present with average mat thickness >1 1/4 in. (measure active & dead layer)	3	0	0	N/A	N/A	0
	Periphyton (Blue-green algae) present with average mat thickness between 3/4 in. to 1 1/4 in. (active & dead layer)	2					
	Periphyton (Blue-green algae) present with average mat thickness between 1/4 in. to 3/4 in. (active & dead layer)	1					
	Periphyton (Blue-green algae) not present or if present with average thickness of 0.0 to 1/4 in. (active & dead layer)	0					
d. Category 1 and Category 2 exotic plants or (non-native) species	< (or = to) 1 % exotic plant cover	3	3	3	3	*	N/A
	>1 % to 10 % exotic plant cover	2					
	>10 % to 85 % exotic plant cover	1					
	> 85 % exotic plant cover	0					
e. Habitat diversity (vegetative) (within assessment area)	>3 native species communities on site within assessment area	3	1	1	3	*	0
	2 or 3 native species communities on site within assessment area	2					
	1 native species community with 75 % to 90 % coverage within assessment area	1					
	1 native species community has > 90 % coverage within assessment area	0					
f. Biological diversity within 3000 feet (approximately 1/2 mile from edge of assessment area)	> 3 alternative habitats available (including upland)	3	3	3	3	*	3
	2 to 3 alternative habitats	2					
	1 alternative habitat	1					
	Same habitat type, or inappropriate / impacted	0					

* = Planting incomplete, so W.A.T.E.R. not executed.

Mitigation Bank Wetland Function Evaluation Matrix

W.A.T.E.R. - Wetland Assessment Technique for Environmental Reviews

Based on WBI, WQI, WRAP, HGM and 4th Priority Project List (PPL) with technical advice from EPA, FDEP, ACOE, NMFS, USF & W, SFWMD & Dade County

Project: FPL - Turkey Point

Reviewer: Justin Styer and Josh Houser

Date:

			Polygon	Polygon	Polygon	Polygon	Polygon
			D-North	D-Mid	Cooling Canals, Ribs 3, 4, 5 - upland	Cooling Canals, Ribs 1 & 2 - wetland	Cooling Canals, Ribs 3 & 4 - wetland
3. Hydrologic Functions							
a. Surface water hydrology / sheet flow Apply to freshwater, saltwater, brackish and mitigation systems	Major connection (Flowing water/ river or floodplain/ uniform flow through natural systems)	3	2	2	0	*	0
	Moderate connection (Natural restriction of flow or Flowing water due to hydrologic engineering)	2					
	Minor connection (Runoff collection point, or uneven flow due to berms, ditches, roadways etc.)	1					
	Hydrologically isolated, no net lateral movement	0					
b. Hydroperiod (normal year) fresh systems	> 8 months inundated with no reversals & every year drydown	3	N/A	N/A	0	N/A	2
	>5 months < 8 months or >5 years continuous inundation (look for strong water stains on persistent vegetation)	2					
	>1 month < 5 months, with possible reversals (look for soft or less distinct water stains on persistent vegetation)	1					
	< 4 weeks cumulative annual inundation or < 2 weeks continuous inundation	0					
b-1 Alternate to b. for Short Hydroperiod (normal year) fresh systems:	>10 weeks of continuous inundation including soil saturation	3	N/A	N/A	N/A	*	N/A
	> 6 weeks but <10 weeks of continuous inundation including soil saturation	2					
	>2 weeks but <6 weeks of inundation, including soil saturation	1					
	<2 weeks of continuous inundation	0					
b-2 Alternate to b. for Saltwater, brackish (tidal) systems	Inundated by >90% high tides	3	3	3	N/A	N/A	N/A
	Inundated by "spring" high tides (bi-monthly)	2					
	Inundated by "extreme high" tides only (biannually)	1					
	Inundated by storm surges only	0					

* = Planting incomplete, so W.A.T.E.R. not executed.

Mitigation Bank Wetland Function Evaluation Matrix

Project: FPL - Turkey Point

W.A.T.E.R. - Wetland Assessment Technique for Environmental Reviews

Reviewer: Justin Styer and Josh Houser

Based on WBI, WQI, WRAP, HGM and 4th Priority Project List (PPL) with technical advice from EPA, FDEP, ACOE, NMFS, USF & W, SFWMD & Dade County

Date:

			Polygon	Polygon	Polygon	Polygon	Polygon
			D-North	D-Mid	Cooling Canals, Ribs 3, 4, 5 - upland	Cooling Canals, Ribs 1 & 2 - wetland	Cooling Canals, Ribs 3 & 4 - wetland
3. Hydrologic Functions continued							
c. Hydropattern (fresh system)	>1 ft. water depth for at least 2.5 months and <6 in. for >1 month (measure water mark/ lichen line), or water depth ideal for specific wetland system.	3	N/A	N/A	0	*	3
	>6 in to 1 ft. for at least 2.5 months (measure water mark/ lichen line) or water depth borderline over or under for specific wetland system	2					
	<6 in. for at least 2.5 months (measure water mark/ lichen line) or water depth incorrect for specific wetland system	1					
	<6 in. in association with either canals, ditches, swales, culverts, pumps, and/or wellfields, or these factors cause water depth to be too deep for specific system.	0					
c-1 Alternate to c. for Saltwater, brackish (tidal) systems	>1 ft. water depth <2 ft. on 90% high tides	3	1	1	N/A	N/A	N/A
	> 6 in. water depth <1 ft. on >50% high tides	2					
	< 6 in. water depth, but > than saturated	1					
	Saturated by saline water table only	0					
d. Water Quality	No indication of poor water quality (lab testing required, all values within acceptable range)	3	2	2	N/A	*	2
	No visual indicators of poor water quality observed (1 value just over or under acceptable range)	2					
	Visual indicators of poor water quality questionable (2 values over or under acceptable range)	1					
	Visual indicators of poor water quality observed or lab verified (values are out of acceptable range)	0					
e. Intactness of historic topography (soil disturbance)	Unaltered	3	3	3	0	*	0
	Slightly altered soil disturbance, < 10% of assessment area	2					
	Moderately altered soil disturbance, < 25% of assessment area	1					
	Extremely altered soil disturbance, may exceed 50% of assessment area	0					
f-2 Alternate to f. for Freshwater, saltwater, brackish (tidal) systems	Calcareous loam >12 in. and >90 % of surface area	3	3	3	1	*	0
	Calcareous loam >6 in. to <12 in. and >90% of surface area	2					
	Calcareous loam >1 in. to <6 in. and covering >50% but <90% of surface area	1					
	Calcareous loam <1 in. for >50% of surface area	0					

* = Planting incomplete, so W.A.T.E.R. not executed.

Mitigation Bank Wetland Function Evaluation Matrix

Project: FPL - Turkey Point

W.A.T.E.R. - Wetland Assessment Technique for Environmental Reviews

Reviewer: Justin Styer and Josh Houser

Based on WBI, WQI, WRAP, HGM and 4th Priority Project List (PPL) with technical advice from

Date:

EPA, FDEP, ACOE, NMFS, USF & W, SFWMD & Dade County

Part 1: Mitigation Function			Polygon	Polygon	Polygon	Polygon	Polygon
Salinity			D-North	D-Mid	Cooling Canals, Ribs 3, 4, 5 - upland	Cooling Canals, Ribs 1 & 2 - wetland	Cooling Canals, Ribs 3 & 4 - wetland
4. Salinity Parameters Apply to freshwater, saltwater, brackish, hypersaline and mitigation systems - Choose 1							
a. Optimum salinity for fresh systems during growing season based on mean high salinity for a normal year. Apply to freshwater systems within 5 miles of the coast	<2 parts per thousand (ppt)	3	N/A	N/A	N/A	*	2
	2 to 3 parts per thousand (ppt)	2					
	4 to 5 parts per thousand (ppt)	1					
	>5 parts per thousand (ppt)	0					
a-2. Alternate to a. Optimum salinity for saline systems during growing season based on mean high salinity for a normal year. Apply to saline marsh (tidal) systems only	17 to 19 parts per thousand (ppt)	3	1	0	N/A	N/A	N/A
	20 to 22 parts per thousand (ppt)	2					
	23 to 25 parts per thousand (ppt)	1					
	>25 parts per thousand (ppt)	0					

* = Planting incomplete, so W.A.T.E.R. not executed.

Cotleur Hearing, Inc.	Cumulative Score (SC)	36.00	35.00	18.00	*	17.00
W.A.T.E.R. created by: Bill L. Maus	Maximum Possible Score (MPS)	54.00	54.00	39.00	*	45.00
11/1/1998	W.A.T.E.R. = Cumulative Score/Maximum Possible Score	0.67	0.65	0.46	*	0.38
	Success Criteria	0.86	0.86	0.25	*	0.45
	Percent of Success Criteria Score	77.90%	75.58%	184.00%	*	84.44%

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix D Red Barn Planting List

FPL - Turkey Point Wetlands Expansion Project (JO5 - 343)
Revised Plant Red Barn

Description	Quantity
Amyris Elemifera 3 gal 1.5'x1.5' (Torchwood)	534
Bursera Simaruba 8'x4' 1.5" cal (Gumbo limbo)	22
Calyptanthus zuzygium 8'x4' 1.5" cal (Myrtle of the River)	24
Chrysobalanus icaco 3 Gal 1.5'x1.5' (Cocoplum)	396
Cocoloba uvifera 3 gal 1.5'x1.5' (Sea Grape)	571
Cocoloba Uvifera 8'x4' 1.5" cal (Seagrape)	16
Cocoloba diversifolia 8'x4' 1.5" cal (Pigeon Plum)	31
Conocarpus erectus 8'x4' 1.5" cal (Green Buttonwood)	9
Conocarpus erectus var. sericeus 8'x4' 1.5" cal (Silver Buttonwood)	36
Cordia Sebesta 8'x4' 1.5" cal (Orange Geiger)	32
Eugenia Spp 8'x4' 1.5" cal (Stopper)	39
Ficus Aurea 8'x4' 1.5" cal (Strangler Fig Specimen)	10
Genipa Clusifolia 8'x4' 1.5" cal (Seven Year Apple)	42
Guaiacum Sanctum 8'x4' 1.5" cal (Lignum Vitae)	13
Guapira discolor 8'x4' 1.5" cal (Blolly)	6
Krugiodendron ferreum 8'x4' 1.5" cal (Black Ironwood)	43
Myrica cerifera 8'x4' 1.5" cal (Wax Myrtle)	30
Myrica cerifera 3 Gal 1.5'x1.5' (Wax Myrtle)	338
Myrsine guianensis 3 Gal (Myrsine)	386
Ocotea Coriacea 3gal 1.5'x1.5' (Lancewood)	360
Persea borbonia 8'x4' 1.5" cal (Red Bay)	16
Sabal palmetto 18', 12', 8'-CT	36
Serenoa repens 3gal 1.5'x1.5' (Saw Palmetto)	191
Sideroxylon salicifolium 8'x4' 1.5 cal (Willow Busic)	15
Sophora tomentosa 3gal 1.5'x1.5' (Necklace Pod)	366
Swietenia mahogany (Mahogany) 8'x4' 1.5" cal	8
Suriana Maritima 3gal 1.5'x1.5' (Bay Cedar)	453

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix E Observed Wildlife

OBSERVED WILDLIFE

Scientific Name	Common Name	FWC Status	FWS Status	Area Observed
BIRDS				
<i>Egretta caerulea</i>	Little blue heron	SSC	NL	Cooling Canals - Rib #3 (wetland)
<i>Egretta tricolor</i>	Tricolored heron	SSC	NL	Cooling Canals - Rib #3 (wetland), Area D-Mid
<i>Ardea herodias</i>	Great blue heron	NL	NL	Cooling Canals - Rib #3 (wetland and upland), Area D-Mid
<i>Aradrius vociferous</i>	Killdeer	NL	NL	Cooling Canals - Rib #3 (wetland)
<i>Phalacrocorax auritus</i>	Cormorant	NL	NL	Cooling Canals - Rib #4 (wetland)
<i>Ardea alba</i>	Great egret	NL	NL	Cooling Canals - Rib #4 (wetland and upland)
<i>Mycteria americana</i>	Wood stork	E	E	Cooling Canals - Rib #4 (upland), Area D-Mid
<i>Eudocimus albus</i>	White ibis	SSC	NL	Cooling Canals - Rib #4 (upland)
<i>Cathartes aura</i>	Turkey vulture	NL	NL	Cooling Canals - Rib #4 (upland), Rib #5
REPTILES				
<i>Crocodylus acutus</i> *	American crocodile	E	E	Cooling Canals - Rib #4 (wetland), Areas D-Mid, D-North
MAMMALS				
<i>Procyon lotor</i> *	Raccoon	NL	NL	Cooling Canals - Ribs #3,4,5 (upland), Areas D-Mid, D-North
FISH				
<i>Fundulus grandis</i>	Gulf killifish	NL	NL	Areas D-Mid, D-North
<i>Fundulus similis</i>	Longnose killifish	NL	NL	Areas D-Mid, D-North
<i>Floridichthys carpio</i>	Gold spotted killifish	NL	NL	Areas D-Mid, D-North
<i>Cyprinodon variegatus</i>	Sheephead minnow	NL	NL	Areas D-Mid, D-North
MACROINVERTEBRATES				
<i>Melomera corona</i>	King's crown	NL	NL	Areas D-Mid, D-North

* = Although not directly observed, track and scat were present on site.

FWC = Florida Fish and Wildlife Conservation Commission

FWS = United States Fish and Wildlife Service

E = Endangered

SSC = Species of special concern

NL = Not listed

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix F Photographs



Date: November 28, 2005
Location: Cooling Canals Transect #1 Photo Station #1



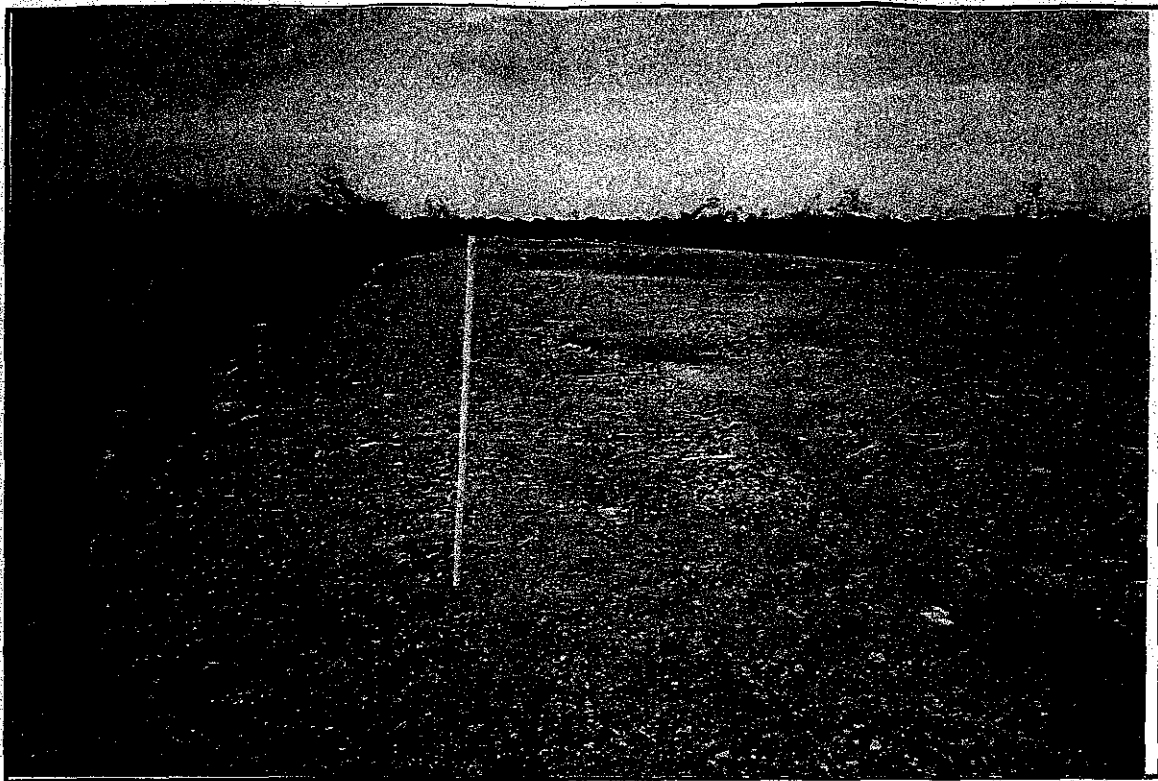
Date: November 28, 2005
Location: Cooling Canals Transect #2 Photo Station #2



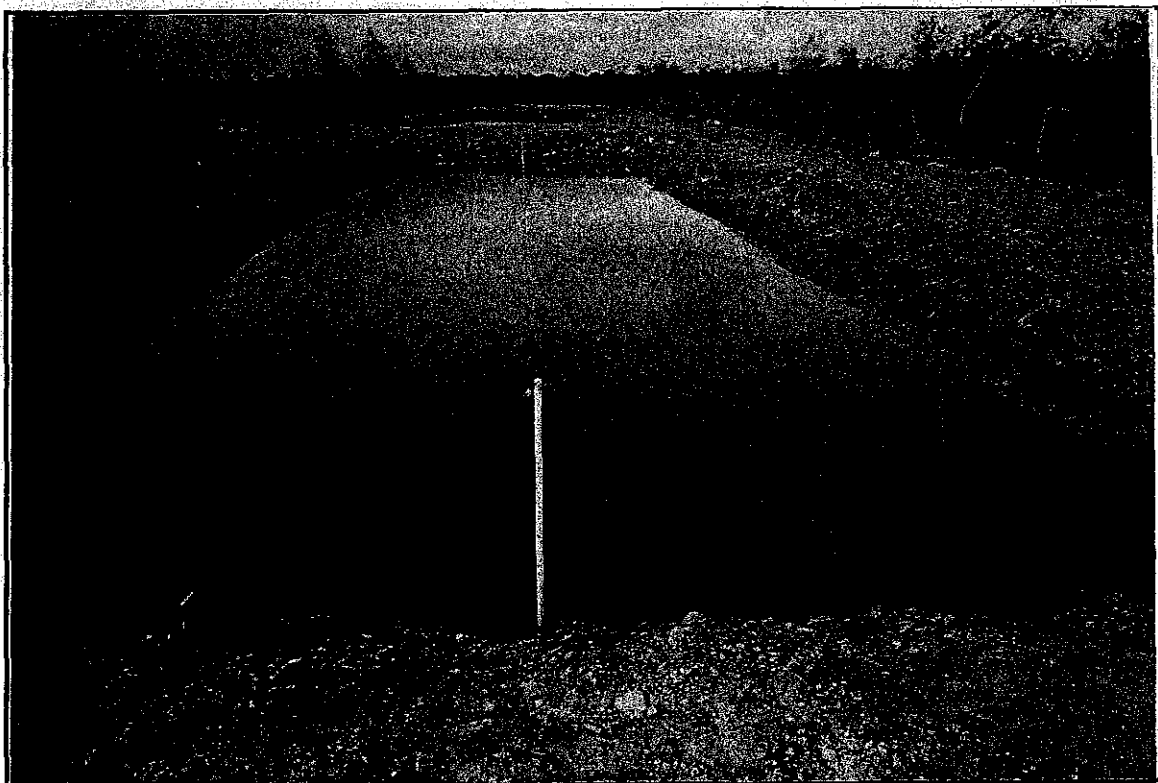
Date: November 28, 2005
Location: Cooling Canals Transect #3 Photo Station #3



Date: November 28, 2005
Location: Cooling Canals Transect #4 Photo Station #4



Date: November 28, 2005
Location: Cooling Canals Transect #5 Photo Station #5



Date: November 28, 2005
Location: Cooling Canals Transect #6 Photo Station #6



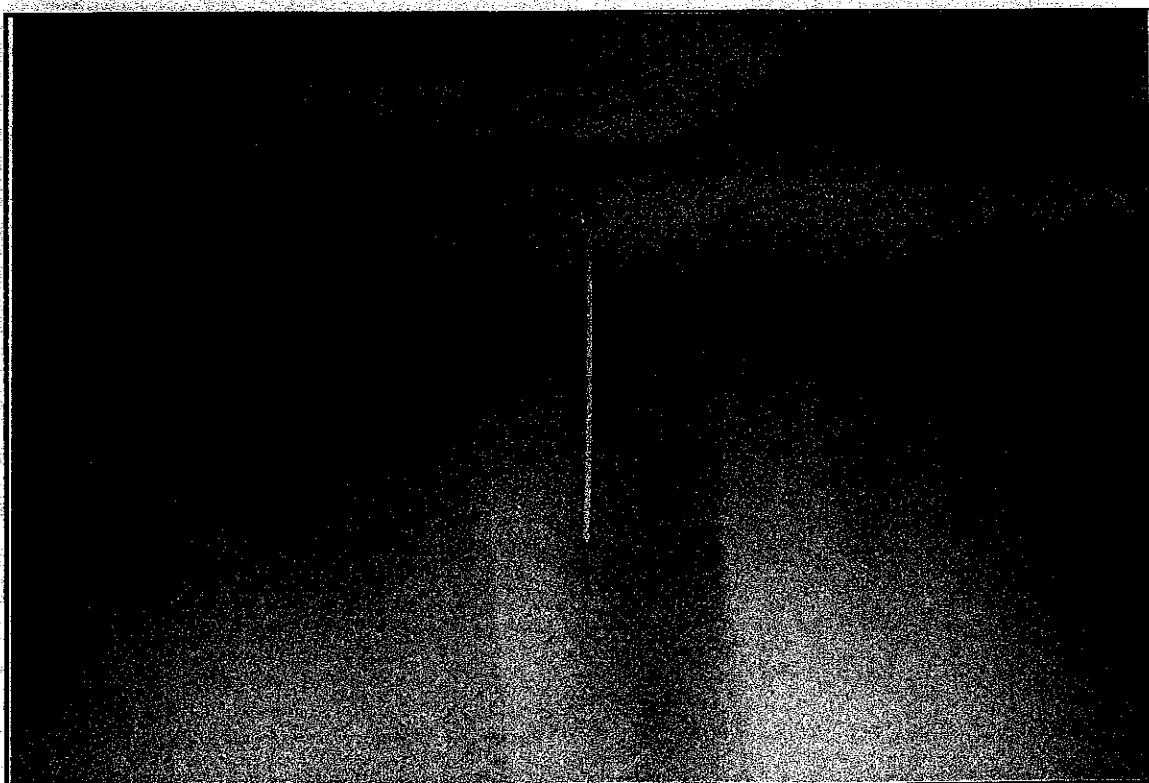
Date: November 28, 2005
Location: Cooling Canals Transect #7 Photo Station #7



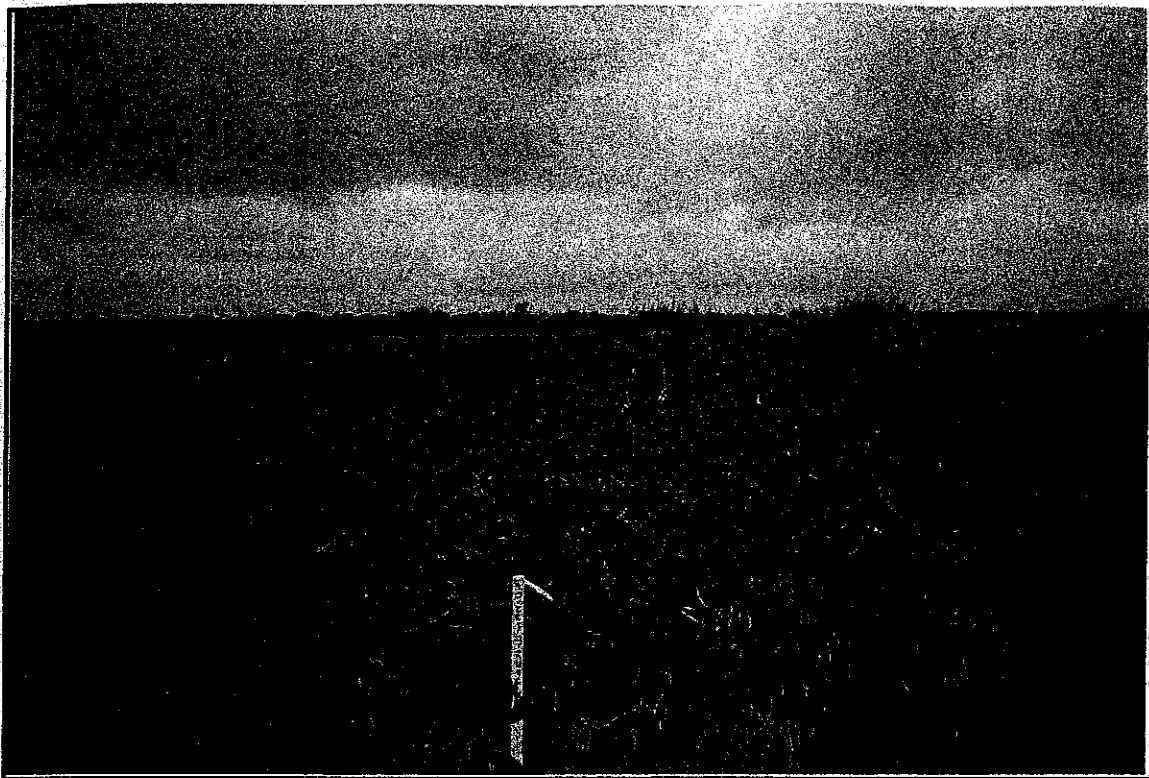
Date: November 28, 2005
Location: Cooling Canals Transect #8 Photo Station #8



Date: November 28, 2005
Location: Cooling Canals Transect #9 Photo Station #9



Date: November 28, 2005
Location: Cooling Canals Transect #10 Photo Station #10



Date: November 29, 2005
Location: D-North Transect #1 Photo Station #1



Date: November 29, 2005
Location: D-North Transect #2 Photo Station #2



Date: November 29, 2005
Location: D-North Transect #3 Photo Station #3



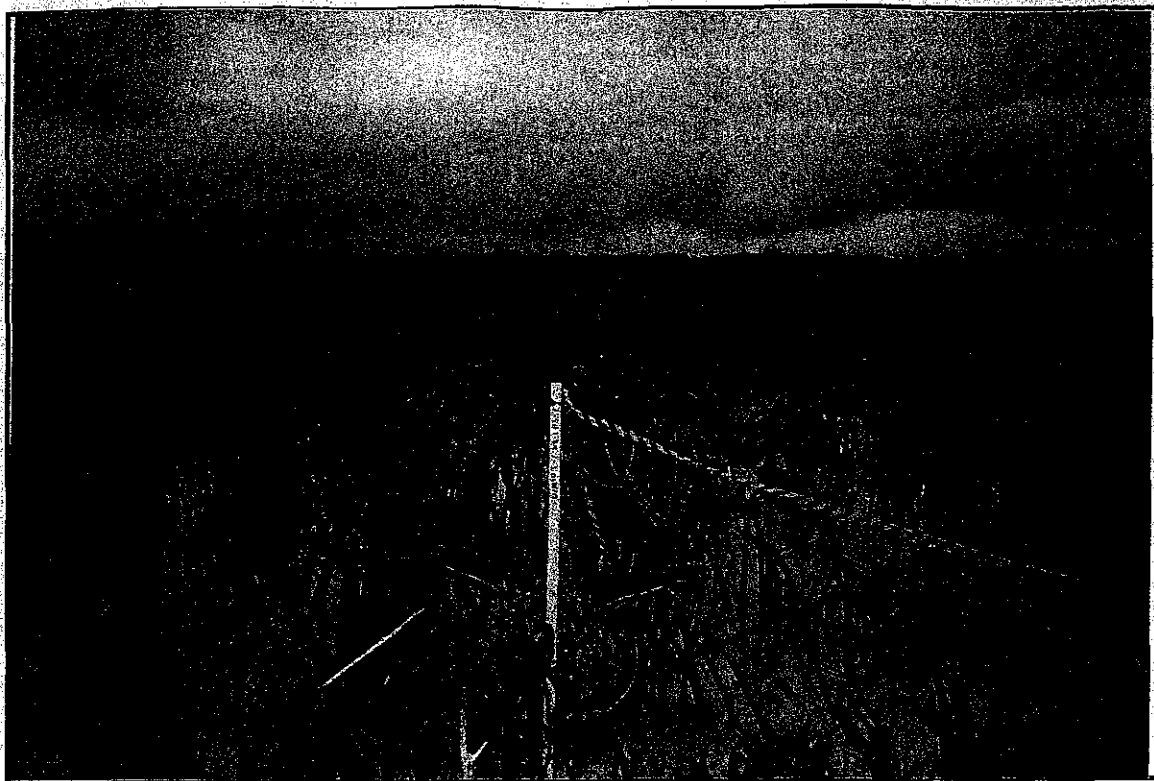
Date: November 29, 2005
Location: D-Mid Transect #4 Photo Station #4



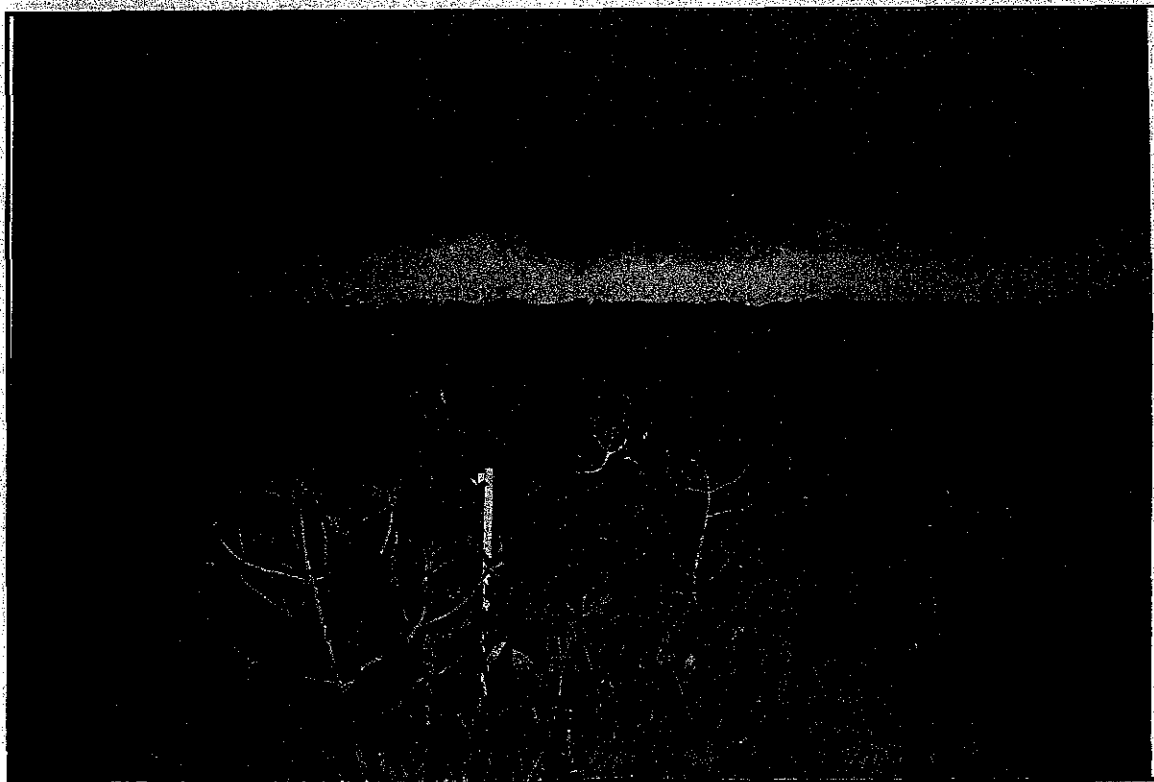
Date: November 29, 2005
Location: D-Mid Transect #5 Photo Station #5



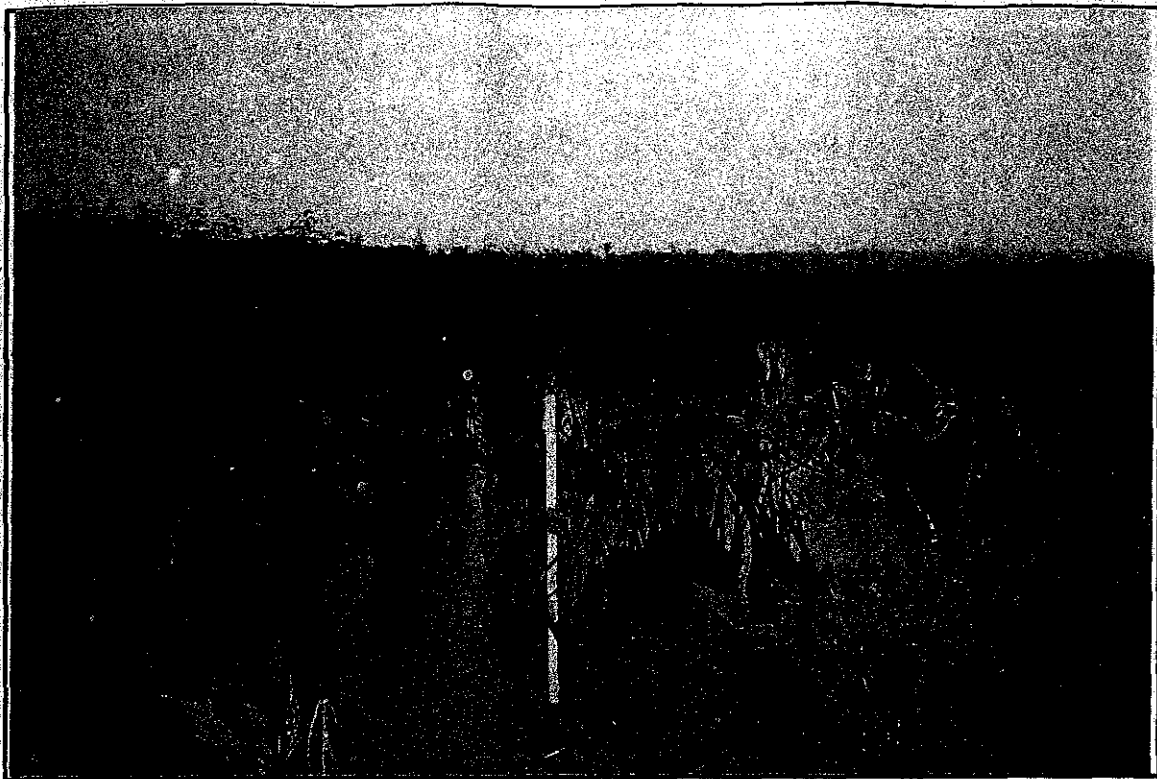
Date: November 29, 2005
Location: D-Mid Transect #6 Photo Station #6



Date: November 29, 2005
Location: D-Mid Transect #7 Photo Station #7



Date: November 29, 2005
Location: D-Mid Transect #8 Photo Station #8



Date: November 29, 2005
Location: D-Mid Transect #9 Photo Station #9



Date: November 29, 2005
Location: D-Mid Transect #10 Photo Station #10



Date: November 29, 2005
Location: Red Barn Transect #1 Photo Station #1



Date: November 29, 2005
Location: Red Barn Transect #2 Photo Station #2

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

Appendix G Monitoring Report Schedule

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

MONITORING REPORT SCHEDULE

REPORT	AGENCY	SUBMITTAL DATE
Time Zero/Baseline	Wilson Miller/USACOE/FPL	December, 2005
First Quarterly	Wilson Miller/USACOE/FPL	March, 2006
First Semi-Annual	Wilson Miller/USACOE/FPL	June, 2006
Second Quarterly	Wilson Miller/USACOE/FPL	September, 2006
First Annual	Wilson Miller/USACOE/FPL	December, 2006
Third Quarterly	Wilson Miller/USACOE/FPL	March, 2006
Second Semi-Annual	Wilson Miller/USACOE/FPL	June, 2006
Fourth Quarterly	Wilson Miller/USACOE/FPL	September, 2006

Turkey Point
Time Zero/Baseline Monitoring Report
November 2005 Monitoring Event

CIRCULATION LIST

- U.S. Army Corps of Engineers
Palm Beach Regulatory Office
Attn: Tori White
4400 PGA Boulevard, Suite 500
Palm Beach Gardens, Florida 33410
Re: Project No: SAJ-2004-813 (IP-TKW)
- U.S. Army Corps of Engineers
Enforcement Section (CESAJ-RD-PE)
Attn: Lisa Abernathy
P.O. Box 4970
Jacksonville, Florida 32232-0019
Re: Project No: SAJ-2004-813 (IP-TKW)
- DEP Southeast District Office
Attn: Don Keirn
400 N. Congress Ave
West Palm Beach, Florida 33401
- DEP Southeast District Office
Attn: Tim Gray
400 N. Congress Ave.
West Palm Beach, Florida 33401
- Biscayne National Park
Attn: Richard Curry
9700 SW 328th Street
Homestead, Florida 33033-5634
- National Marine Fisheries Service,
Habitat Conservation Division
Attn: Audra Livergood
11420 North Kindall Drive
Suite 103
Miami, Florida 33176
- Florida Power & Light
Attn: Rachel Godino
700 Universe Boulevard
Juno Beach, Florida 33408
- WilsonMiller, Inc.
Attn: Ann M. Redmond
1441 Maclay Commerce Drive
Suite 101
Tallahassee, Florida 32312