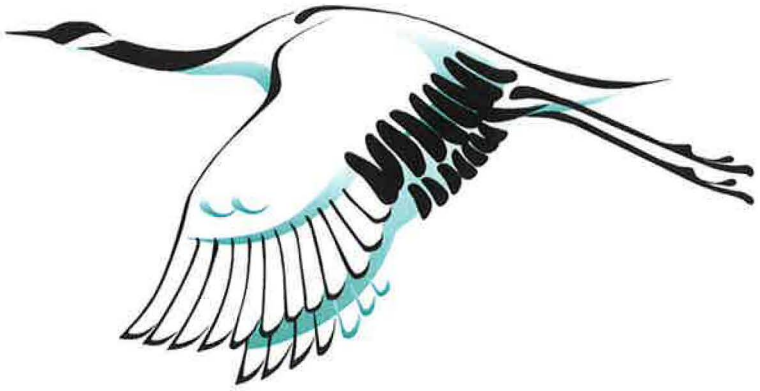
FLORIDA INLAND NAVIGATION DISTRICT
DREDGE MATERIAL MANAGEMENT AREA
IR-2 MITIGATION AREA

Indian River County, Florida

First Annual Mitigation Monitoring Report

FDEP Permit #s 56-0255662-001, 31-0273920-001-EI, 31-0273920-003-EM

April 2014



Prepared for:
Florida Inland Navigation District
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Prepared by:
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FLORIDA INLAND NAVIGATION DISTRICT
DREDGE MATERIAL MANAGEMENT AREA
IR-2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT

1.00 INTRODUCTION

The Florida Inland Navigation District (FIND) Dredge Material Management Area (DMMA) IR-2 mitigation area consists of approximately +/- 7.18 acres of land located north of CR 510, east of Federal Highway, and west of the Indian River Lagoon in Section 20, Township 31S, Range 39E, Sebastian, Indian River County, Florida (Figures 1, 2 and 3 of 9). The mitigation area is divided into three (3) areas: a mitigation area of 1.55 acres for DMMA IR-2 construction impacts, a mitigation area of 2.80 acres for DMMA SL-2 construction impacts and a 1.60 acre area for advanced mitigation of future impacts (Figure 4 -6 of 9).

Hobe Sound Environmental Consultants, Inc. (HSE) has been retained by FIND to conduct annual monitoring and prepare annual reports to comply with Florida Department of Environmental Protection (FDEP) Permit #s 56-0255662-001, ERP31-0273920-001-EI and ERP31-0273920-003-EM. The annual reports are being prepared to document the progress of the wetland mitigation area. The reports will include results of annual monitoring comprised of vegetation analysis, panoramic and quadrat photographs, and conclusions.

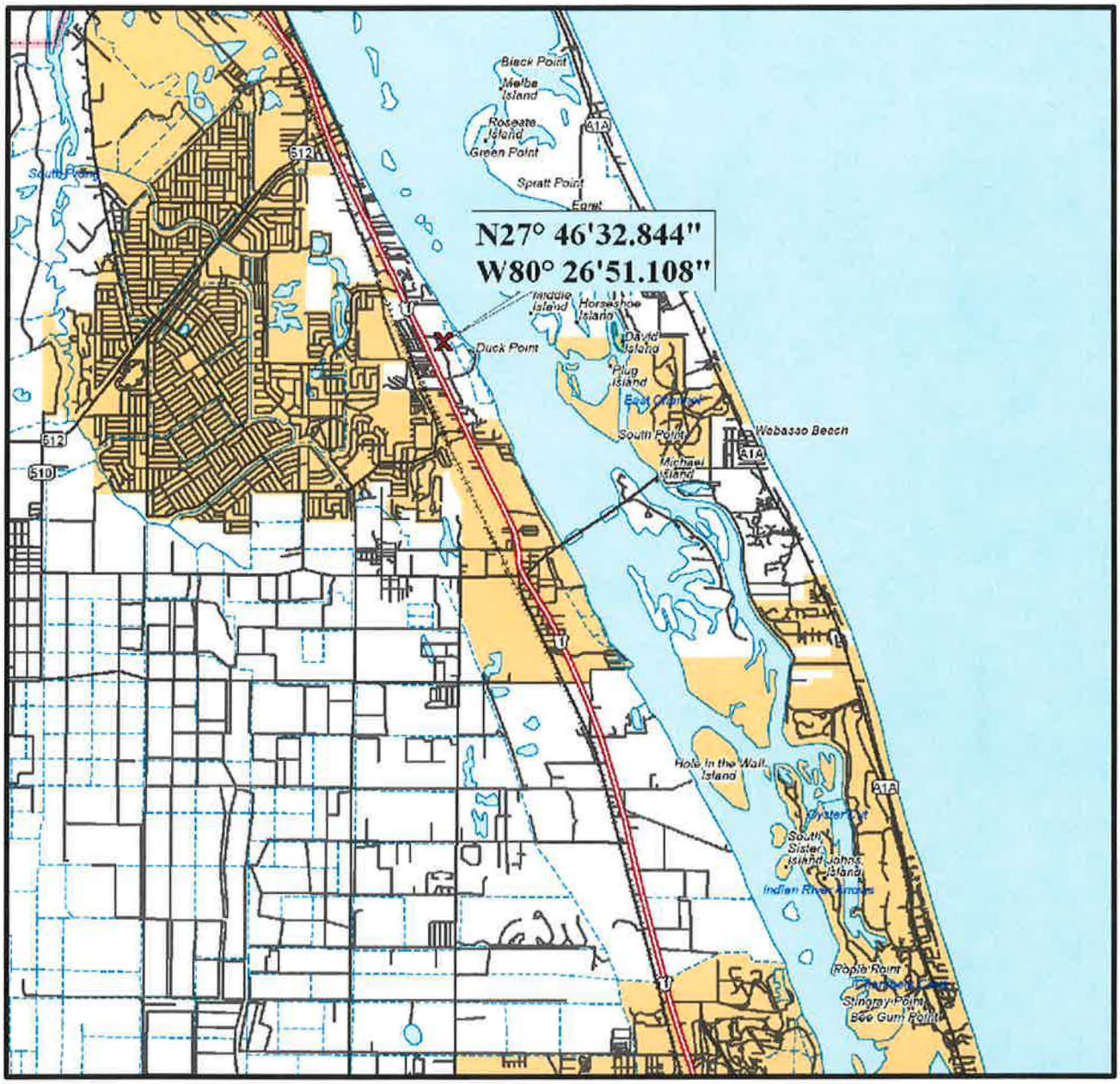
This is the First Annual Mitigation Monitoring Report completed by HSE for the DMMA IR-2 mitigation area. Data was collected for this report on 30 April 2014. Monitoring is scheduled annually in April of each year for a period of five (5) consecutive years. A final report will be submitted to the FDEP in April 2018. Table 1 depicts the monitoring schedule for this project site.

NOT A SURVEY

NORTH

0' 9,000' 18,000' 36,000' 72,000

SCALE: 1" = 18,000'



SOURCE: DELORME STREET ATLAS USA, DELUXE.

PERMITS # ERP31-0273920-001EI, ERP31-0273920-003-EM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.: 13-005.02	DRAWING NAME: 01 VIC MAP.DWG	DATE: 5 MAY 2014	FIGURE: 1 OF 9
	20	31S	39E				
LATITUDE: N27° 46'32.844"		LONGITUDE: W080°26'51.108"			DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
VICINITY MAP

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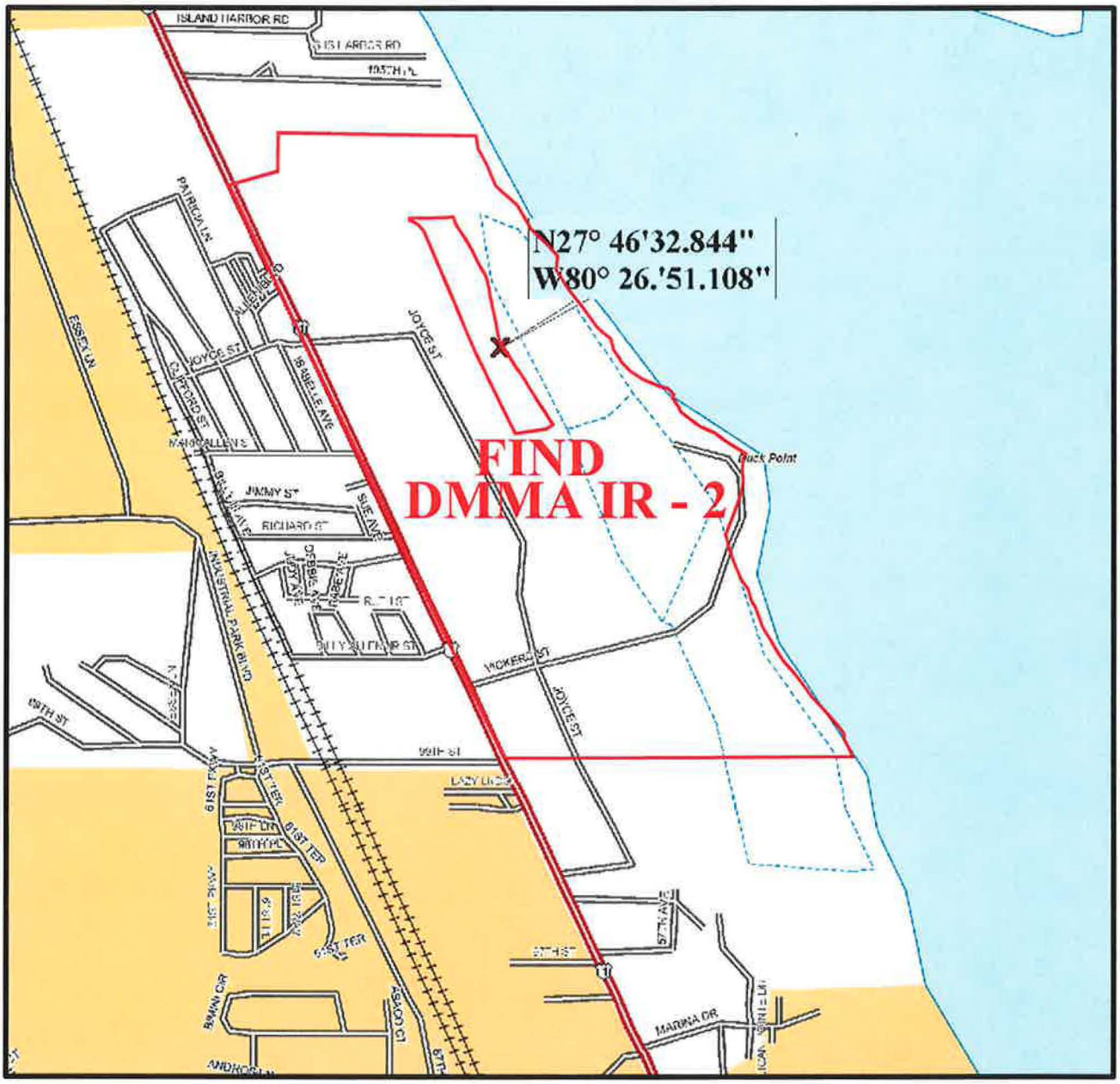
NOT A SURVEY

NORTH

0' 500' 1000' 2000' 4000'

SCALE: 1" = 1000'



SOURCE:DELORME STREET ATLAS USA, DELUXE.

PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-EM AND 56-0255662-001

INDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
	20	31S	39E	13-005.02	02 - LOC MAP.DWG	5 MAY 2014	2 OF 9
LATITUDE: N27° 46'32.844"	LONGITUDE: W080°26'51.108"				DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
LOCATION MAP

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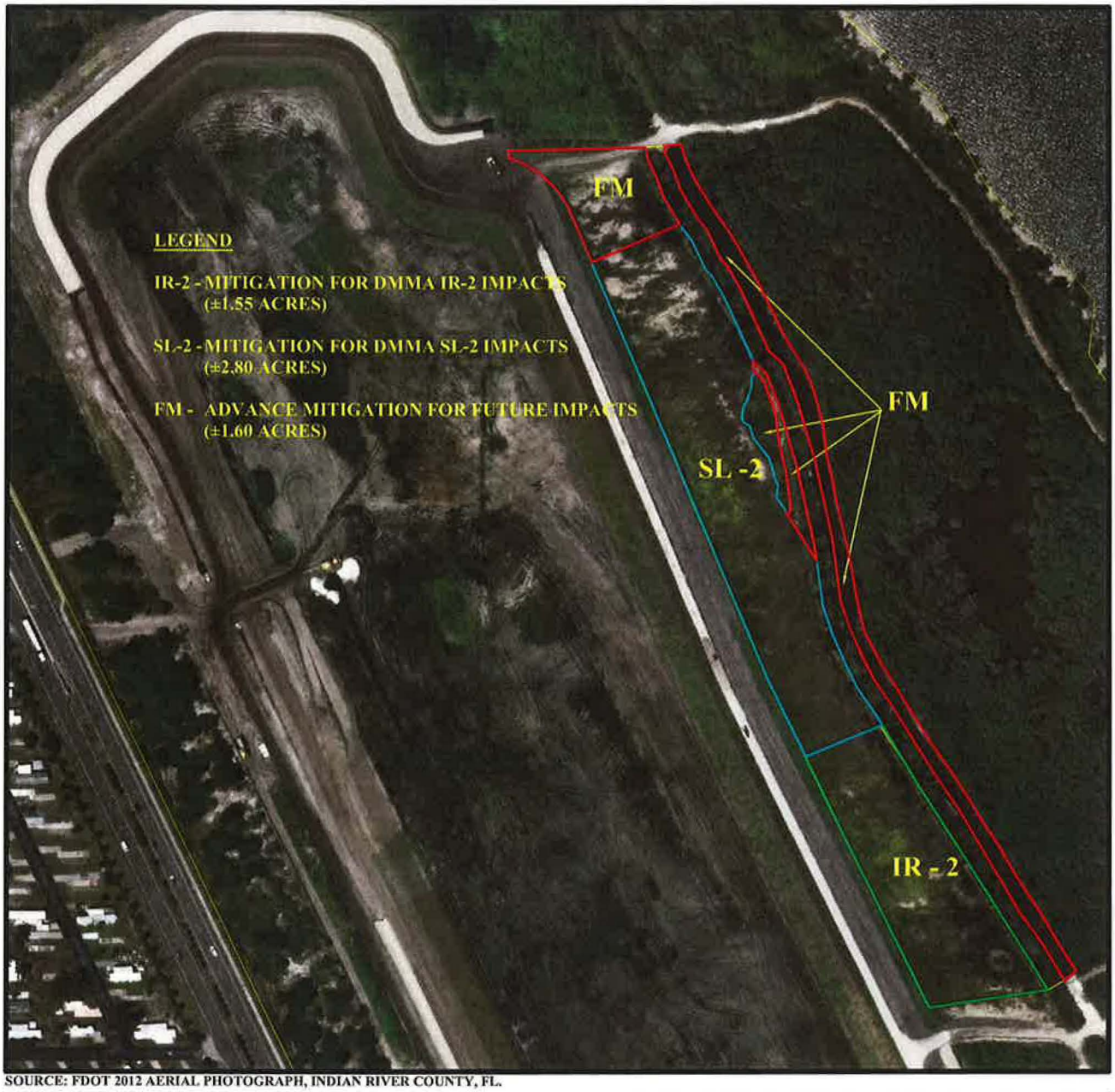
NOT A SURVEY

NORTH

0' 125' 250' 500' 1000'

SCALE: 1" = 250'



SOURCE: FDOT 2012 AERIAL PHOTOGRAPH, INDIAN RIVER COUNTY, FL.

PERMITS # ERP31-0273920-001-E1, ERP31-0273920-003-EM AND 56-0255662-001

INDIAN RIVER, COUNTY FLORIDA	SEC. 20	TWP. 31S	R. 39E	HSE JOB NO.: 13-005.02	DRAWING NAME: 03 - 2012 AERIAL.DWG	DATE: 5 MAY 2014	FIGURE: 3 OF 9
LATITUDE: N27° 46'32.844"		LONGITUDE: W080°26'51.108"			DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
2012 AERIAL PHOTOGRAPH

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NOT A SURVEY

NORTH

0' 150' 300' 600' 1200'

SCALE: 1" = 300'

LEGEND

IR - 2

SL - 2

FUTURE MITIGATION (FM)

SOURCE: FDOT 2012 AERIAL PHOTOGRAPH

PERMITS # ERP31-0273920-001-EI , ERP31-0273920-003-EM AND 56-0255662-001

INDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.: HSE 13-005.01	DRAWING NAME: 04 - MITIGATION AREAS.DWG	DATE: 5 MAY 2014	FIGURE: 4 OF 9
	20	31S	39E				
LATITUDE: 27°46'32.844" LONGITUDE: -80°26'51.108"					DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
MITIGATION AREAS, IR - 2, SL - 2 AND FUTURE MITIGATION

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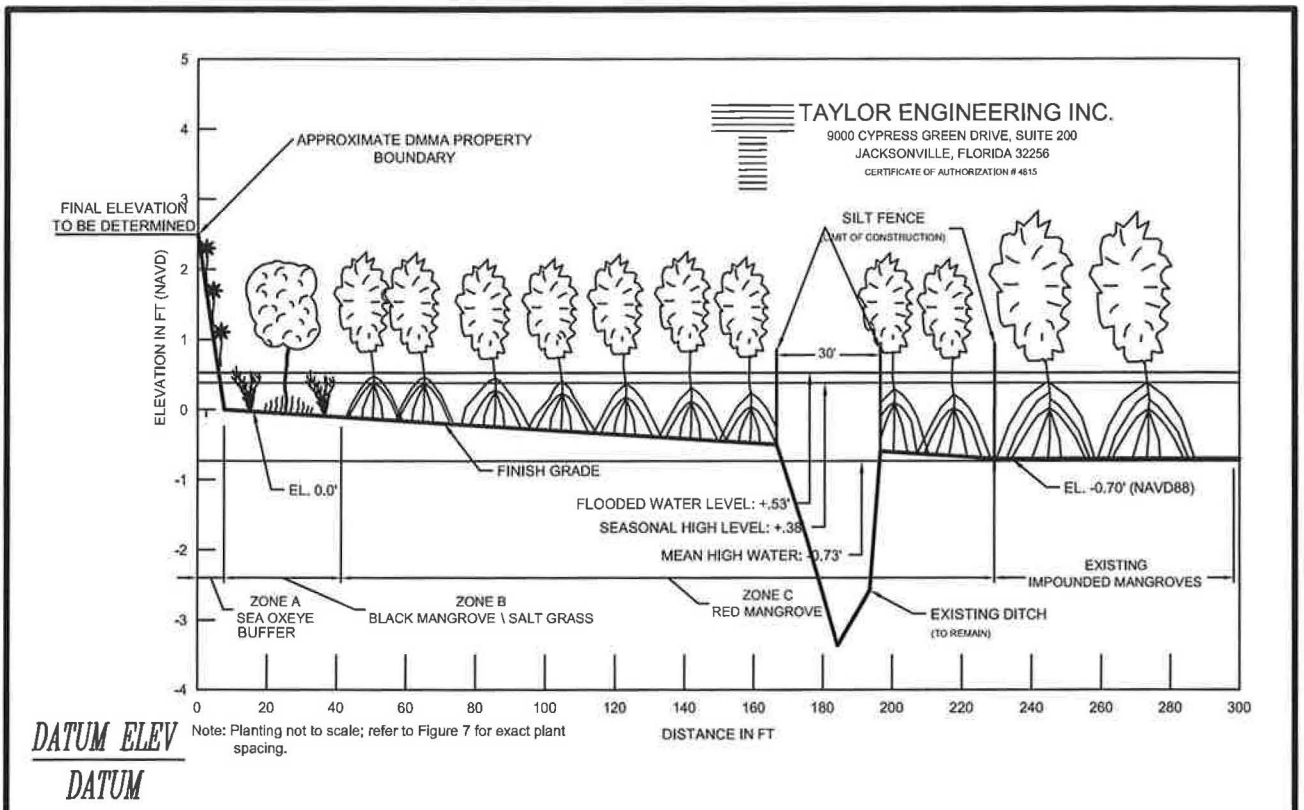
NOT A SURVEY



Note: Planting not to scale; refer to Figure 7 for exact plant spacing.

SPECIES (COMMON NAME)	QUANITY	SPACING (CENTER SPACING)	SIZE
SEA OXYEY DAISEY	10,800	1.5 FT	4 INCH POT
SALT GRASS	3.400	3 FT	ONE - YEAR PLANT
BLACK MANGROVES	300	10FT	ONE-YEAR PLANT
RED MANGROVES	2.500	10FT	3-FOOT STEM PLANT

SOURCE: MITIGATION PLAN BY: TAYLOR ENGINEERING INC., JACKSONVILLE, FLORIDA PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-EM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
	20	31S	39E	13-005.02	05 - MITIGATION PLAN X SECTION	5 MAY 2014	5 OF 9
LATITUDE: N27° 46'32.844"	LONGITUDE: W080°26'51.108"				DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
MITIGATION PLAN CROSS SECTION

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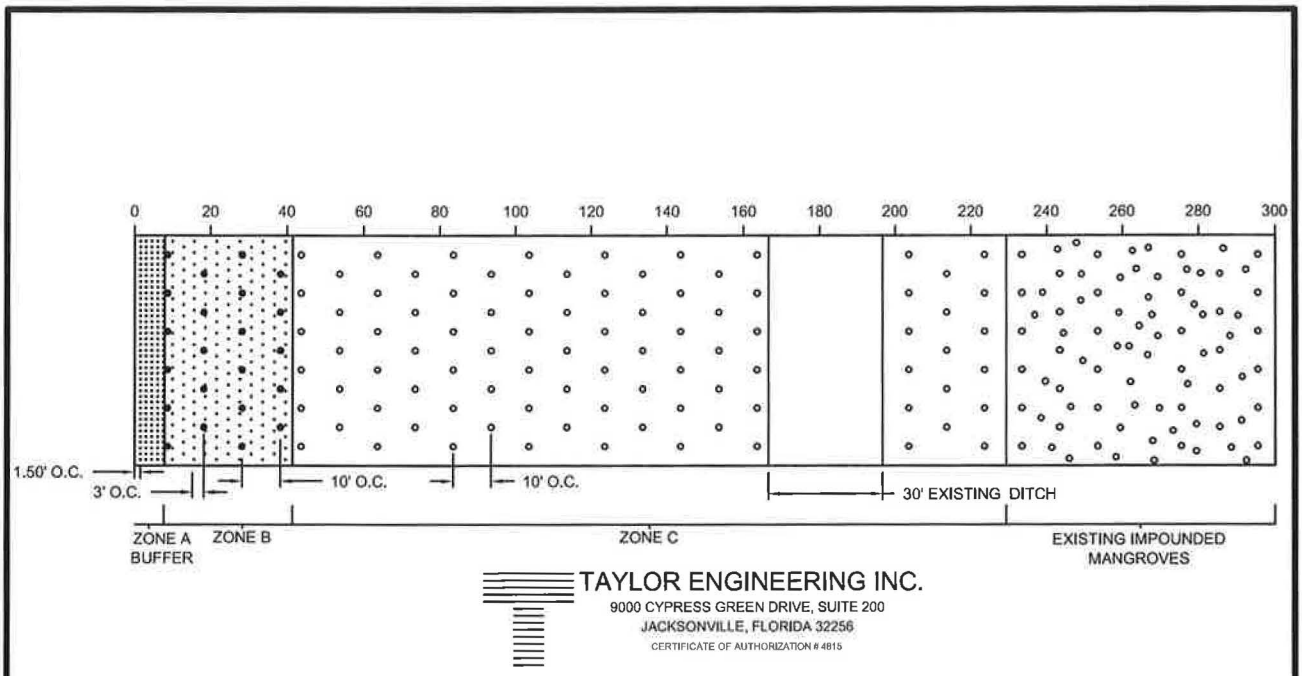
NOT A SURVEY



TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256
CERTIFICATE OF AUTHORIZATION # 4815

LEGEND

- Sea Oxeye (*Borichia frutescens*) Buffer
- Black Mangrove (*Avicenna germinans*) Salt Grass (*Distichlis spicata*)
- Red Mangrove (*Rhizophora mangle*)

SOURCE: MITIGATION PLAN BY: TAYLOR ENGINEERING INC., JACKSONVILLE, FLORIDA PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-EM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
	20	31S	39E	13-005.02	06 - MIT PLAN VIEW.DWG	5 MAY 2014	6 OF 9
LATITUDE: N27° 46'32.844"	LONGITUDE: W080°26'51.108"			DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW	

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
MITIGATION PLAN VIEW (TYPICAL)

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Table 1. Schedule of Monitoring Reports for the DMMA IR-2 Mitigation Area

Report Number	Date
Baseline Report	April 2013
Report #1	April 2014√
Report #2	April 2015
Report #3	April 2016
Report #4	April 2017
Report #5 - FINAL	April 2018

2.00 METHODOLOGY

2.01 Vegetation

HSE established seventeen (17) monitoring transects on-site (Figures 7 and 8 of 9). The beginning of each transect was established with a wooden stake marked with the transect number. At the eastern and western ends of T5, T10 and T15, a 10' tall pvc pipe was stabilized by a 4' piece of rebar driven into the ground behind the stakes to serve as the panoramic photograph locations. Additionally, two (2) panoramic stations were set up at the north and south ends of the monitoring site utilizing the same methodology. Quadrats were set up at all panoramic photograph stations, for a total of eight (8) quadrats (Figure 7 of 9). The panoramic photograph station locations and the SW corner of each quadrat were located using a Garmin GPSMAP175 global positioning system (GPS) unit. The approximate GPS position coordinates for the transects are provided in Table 2 in Figure 8 of 9. The GPS position coordinates for the panoramic photostations and the quadrats can be found as Table 3 in Figure 9 of 9. Plants were identified to species when possible and results were recorded. Within each sample quadrat, the relative plant abundance was estimated and recorded according to the percent-coverage. For a particular sample quadrat, biologists recorded the percent-coverage of all vegetative species or plant groupings observed.

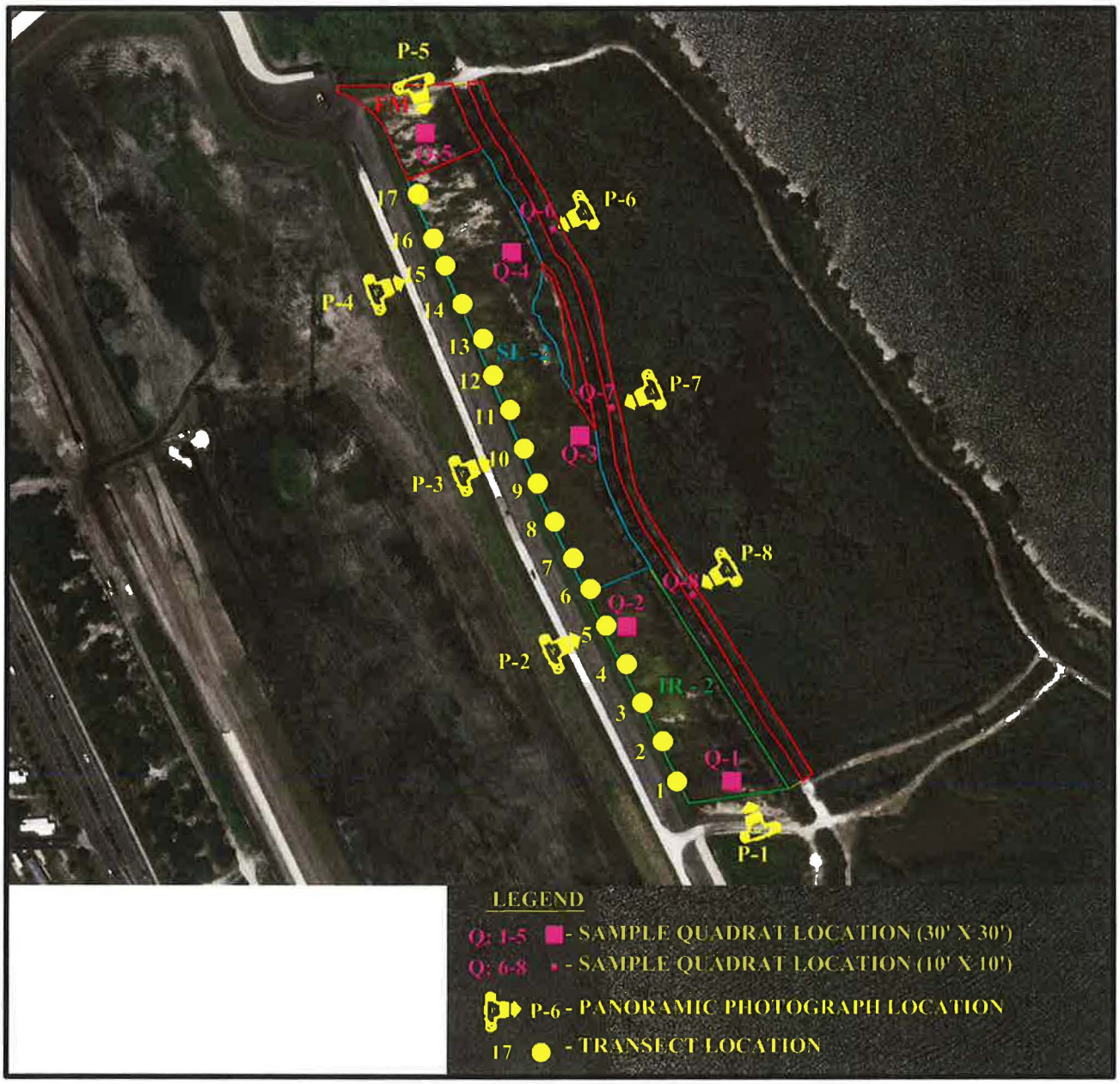
Biologists will conduct annual (April) vegetation surveys of the quadrats for a period of five (5) years. Sample quadrats on the west side of the site are 33 feet × 33 feet (1089 sq. feet), while sample quadrats on the east side of the site in the open water are 10 feet x 10 feet (100 square feet).

NOT A SURVEY

NORTH

0' 150' 300' 600' 1200'

SCALE: 1" = 300'



SOURCE:DELORME STREET ATLAS USA, DELUXE.

PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-WM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.: 13-005.02	DRAWING NAME: 07 - TRAN LOC.DWG	DATE: 5 MAY 2014	FIGURE: 7 OF 9
	20	31S	39E				
LATITUDE: N27° 46'32.844"		LONGITUDE: W080°26'51.108"		DESIGNED BY: RLW	DRAWN BY: FRP		CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
VEGETATION SAMPLE QUADRATS & PANORAMIC PHOTOGRAPH LOCATIONS

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NOT A SURVEY

TABLE: 2 TRANSECT GPS COORDINATES

TRANSECT # 01	MITIGATION AREA IR-2	LATITUDE: 27°46'47.712" LONGITUDE: -80°26'50.388"	TRANSECT # 10	MITIGATION AREA SL-2	LATITUDE: 27°46'53.940" LONGITUDE: -80°26'53.592"
TRANSECT # 02	MITIGATION AREA IR-2	LATITUDE: 27°46'48.468" LONGITUDE: -80°26'50.676"	TRANSECT # 11	MITIGATION AREA SL-2	LATITUDE: 27°46'54.660" LONGITUDE: -80°26'53.880"
TRANSECT # 03	MITIGATION AREA IR-2	LATITUDE: 27°46'49.188" LONGITUDE: -80°26'51.108"	TRANSECT # 12	MITIGATION AREA SL-2	LATITUDE: 27°46'55.308" LONGITUDE: -80°26'54.240"
TRANSECT # 04	MITIGATION AREA IR-2	LATITUDE: 27°46'49.908" LONGITUDE: -80°26'51.432"	TRANSECT # 13	MITIGATION AREA SL-2	LATITUDE: 27°46'55.992" LONGITUDE: -80°26'54.456"
TRANSECT # 05	MITIGATION AREA IR-2	LATITUDE: 27°46'50.628" LONGITUDE: -80°26'51.864"	TRANSECT # 14	MITIGATION AREA SL-2	LATITUDE: 27°46'56.640" LONGITUDE: -80°26'54.888"
TRANSECT # 06	MITIGATION AREA SL-2	LATITUDE: 27°46'51.312" LONGITUDE: -80°26'52.188"	TRANSECT # 15	MITIGATION AREA SL-2	LATITUDE: 27°46'57.360" LONGITUDE: -80°26'55.248"
TRANSECT # 07	MITIGATION AREA SL-2	LATITUDE: 27°46'51.888" LONGITUDE: -80°26'52.548"	TRANSECT # 16	MITIGATION AREA SL-2	LATITUDE: 27°46'57.864" LONGITUDE: -80°26'55.500"
TRANSECT # 08	MITIGATION AREA SL-2	LATITUDE: 27°46'52.572" LONGITUDE: -80°26'52.944"	TRANSECT # 17	MITIGATION AREA SL-2	LATITUDE: 27°46'58.692" LONGITUDE: -80°26'55.824"
TRANSECT # 09	MITIGATION AREA SL-2	LATITUDE: 27°46'53.292" LONGITUDE: -80°26'53.304"			

SOURCE: HSE

PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-EM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC. 20	TWP. 31S	R. 39E	HSE JOB NO.: 13-005.02	DRAWING NAME: 08 - TRAN LOC.DWG	DATE: 5 MAY 2014	FIGURE: 8 OF 9
LATITUDE: N27° 46'32.844"		LONGITUDE: W080°26'51.108"			DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
TRANSECT LOCATION GPS COORDINATES

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NOT A SURVEY

TABLE: 3 PANORAMIC PHOTOGRAPH AND QUADRAT GPS COORDINATES

PANORAMIC PHOTOGRAPH STATION # 01	MITIGATION AREA IR-2	LATITUDE: 27°46'47.431" LONGITUDE: -80°26'49.037"	PANORAMIC PHOTOGRAPH STATION # 05	MITIGATION AREA SL-2	LATITUDE: 27°47'00.568" LONGITUDE: -80°26'55.664"
PANORAMIC PHOTOGRAPH STATION # 02	MITIGATION AREA IR-2	LATITUDE: 27°46'50.628" LONGITUDE: -80°26'51.864"	PANORAMIC PHOTOGRAPH STATION # 06	MITIGATION AREA FM	LATITUDE: 27°46'58.036" LONGITUDE: -80°26'52.960"
PANORAMIC PHOTOGRAPH STATION # 03	MITIGATION AREA SL-2	LATITUDE: 27°46'53.940" LONGITUDE: -80°26'53.592"	PANORAMIC PHOTOGRAPH STATION # 07	MITIGATION AREA FM	LATITUDE: 27°46'54.669" LONGITUDE: -80°26'51.664"
PANORAMIC PHOTOGRAPH STATION # 04	MITIGATION AREA SL-2	LATITUDE: 27°46'57.360" LONGITUDE: -80°26'55.248"	PANORAMIC PHOTOGRAPH STATION # 08	MITIGATION AREA FM	LATITUDE: 27°46'51.276" LONGITUDE: -80°26'49.920"

SAMPLE QUADRAT STATION # 01	MITIGATION AREA SL-2	LATITUDE: 27°46'47.550" LONGITUDE: -80°26'49.408"	SAMPLE QUADRAT STATION # 05	MITIGATION AREA FM	LATITUDE: 27°46'59.664" LONGITUDE: -80°26'55.860"
SAMPLE QUADRAT STATION # 02	MITIGATION AREA SL-2	LATITUDE: 27°46'50.448" LONGITUDE: -80°26'51.612"	SAMPLE QUADRAT STATION # 06	MITIGATION AREA FM	LATITUDE: 27°46'58.036" LONGITUDE: -80°26'52.960"
SAMPLE QUADRAT STATION # 03	MITIGATION AREA SL-2	LATITUDE: 27°46'54.012" LONGITUDE: -80°26'52.584"	SAMPLE QUADRAT STATION # 07	MITIGATION AREA FM	LATITUDE: 27°46'54.669" LONGITUDE: -80°26'51.664"
SAMPLE QUADRAT STATION # 04	MITIGATION AREA SL-2	LATITUDE: 27°46'57.432" LONGITUDE: -80°26'54.024"	SAMPLE QUADRAT STATION # 08	MITIGATION AREA FM	LATITUDE: 27°46'51.276" LONGITUDE: -80°26'49.920"

SOURCE: HSE

PERMITS # ERP31-0273920-001-EI, ERP31-0273920-003-EM AND 56-0255662-001

NDIAN RIVER, COUNTY FLORIDA	SEC.	TWP.	R.	HSE JOB NO.:	DRAWING NAME:	DATE:	FIGURE:
	20	31S	39E	13-005.02	09 - TRAN LOC.DWG	5 MAY 2014	9 OF 9
LATITUDE: N27° 46'32.844"	LONGITUDE: W080°26'51.108"			DESIGNED BY: RLW	DRAWN BY: FRP	CHECKED BY: RLW	

FLORIDA INLAND NAVIGATION DISTRICT
DMMA IR - 2 MITIGATION AREA
FIRST ANNUAL MITIGATION MONITORING REPORT
PANORAMIC PHOTOGRAPH & QUADRAT GPS LOCATIONS

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2.02 Photographic Documentation

Panoramic and quadrat photographs were taken at the locations shown in Figures 7 and 9 of 9. Each quadrat photograph includes a range pole marked in 12" intervals. This will allow the vertical growth of species to be followed accurately during the monitoring period.

2.03 Exotic Species

Exotic and nuisance species such as those listed by the Florida Exotic Pest Council's Category I Invasive Exotic Species List were noted by biologists and are addressed in the recommendations section.

3.00 RESULTS

3.01 Vegetation

Approximately 50% of the mitigation area is dominated by native vegetation including, but not limited to white mangrove (*Laguncularia racemosa*), red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), three square rush (*Scirpus americanus*) and saltgrass (*Distichlis spicata*). The other 50% is dominated by cattails (*Typha* spp.) Please refer to Section 3.03 below for additional information regarding exotics.

Areas along the west berm behind the photostations and on the islands between the cuts continue to be dominated by sea oxeye daisy (*Borrichia frutescens*), with red, black and white mangrove on the islands. While most vegetation appeared healthy and free of insect damage or any other relative forms of stress at the time of monitoring, the black mangroves were observed to have leaves that were being chewed by an insect of some type and webbing on some of the leaves. This could be cyclical and have no affect on the health of the trees. The observations made during the next annual report should be more conclusive.

Within the preservation/mitigation area, mangrove species, especially white mangrove, and other desirable native wetland species including fragrant flatsedge (*Cyperus odoratus*), glasswort (*Salicornia* sp.) and three square were observed naturally recruiting throughout the mitigation area.

During this first annual monitoring, saltgrass increased an estimated 35% in Q1, 10% in Q4 and 25% in Q5, while decreasing 20% and 25% in Q2 & 3 respectively. Three-square rush was observed for the first time in Q4 at 15%. Fall panic grass had an estimated 20% decline in Q1,3,5, while fragrant flatsedge increased 15% in Q5, but declined 10% in Q1&2 respectively. Herb of grace declined 20% and 10% in Q1&5, while white mangrove saw a 20% increase in Q5. The decline of herb-of-grace could be due to the increase in saltgrass.

The red mangroves that were planted in the open water area east of the cuts are all dead. Mature red mangroves are found only near the berm and these were not planted but natural. Please refer to the panoramic photographs of quadrats 6-8, Appendix A, Figures 3 and 4 of 4.

Cattail (*Typha* sp.) is the dominant invasive species within the southern portion of the conservation area. For additional information on exotic vegetation, please refer to Section 3.03. Results of the vegetation transects are shown in Table 4.

3.02 Photographic Documentation

The panoramic and quadrat photographs (Appendix A) illustrate conditions within the mitigation area.

3.03 Exotic/Nuisance Vegetation

During the first annual monitoring cattail had the largest single plant species increase

Table 4. Vegetation Transect Results for the Florida Inland Navigation District DMMA IR-2 Mitigation Area

Quadrat 1, Water depth: 0 - 4"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (4/13)	1st Annual Report (4/14)	
Herb-of-grace	*Bacopa monnieri*	25	5	OBL
Fragrant flatsedge	*Cyperus odoratus*	15	5	FACW
Rosy camphorweed	*Pluchea baccharis*	<5	<5	FACW
White mangrove	*Laguncularia racemosa*	5	5	OBL
Red mangrove	*Rhizophora mangle*	<5	<5	OBL
Black mangrove	*Avicennia germinans*	<5	<5	OBL
Bare ground	*n/a*	5	0	FAC
Cattail	*Typha sp.*	<5	35	OBL
Saltgrass	*Distichlis spicata*	5	40	OBL
Fall panicgrass	*Panicum dichotomiflorum*	25	<5	FACW
Blue-green algae	*Cyanobacteria*	15	0	NI
Saltwort	*Batis maritima*	<5	<5	OBL
Three-square rush	*Scirpus americanus*	n/a	<5	OBL
Alligatorweed	*Alternanthera philoxeroides*	n/a	<5	OBL
Horned beakrush	*Rhynchospora inundata*	n/a	5	OBL

Quadrat 2, Water depth: 0 - 2"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
White mangrove	*L. racemosa*	5	5	OBL
Red mangrove	*R. mangle*	<5	<5	OBL
Black mangrove	*A. germinans*	<5	<5	OBL
Saltgrass	*D. spicata*	60	40	OBL
Fragrant flatsedge	*C. odoratus*	15	<5	FACW
Cattail	*Typha sp.*	<5	50	OBL
Sea oxeye daisy	*Borrichia frutescens*	<5	<5	OBL

Table 4, continued

Herb-of-grace	*B. monnieri*	<5	<5	OBL
Blue-green algae	*Cyanobacteria*	5	0	NI
Alligatorweed	*A. philoxeroides*	10	<5	OBL
Wild dock	*Rumex pulcher*	n/a	<5	FACW

Quadrat 3, Water depth: 4 - 5"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
White mangrove	*L. racemosa*	<5	<5	OBL
Red mangrove	*R. mangle*	5	5	OBL
Fragrant flatsedge	*C. odoratus*	5	<5	FACW
Rosy camphorweed	*P. baccharis*	<5	0	FACW
Alligatorweed	*A. philoxeroides*	5	10	OBL
Saltgrass	*D. spicata*	55	30	OBL
Cattail	*Typha sp.*	25	55	OBL

Quadrat 4, Water depth: 8 - 10"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
Fall panic grass	*P. dichotomiflorum*	25	**<5**	OBL
Bare ground	*n/a*	20	0	n/a
Blue-green algae	*Cyanobacteria*	45	5	NI
Open water	*n/a*	5	65	n/a
Red mangrove	*R. mangle*	<5	<5	OBL
White mangrove	*L. racemosa*	<5	<5	OBL
Saltgrass	*D. spicata*	n/a	10	OBL
Fragrant flatsedge	*C. odoratus*	n/a	<5	FACW
Alligatorweed	*A. philoxeroides*	n/a	<5	OBL

Table 4, continued

Torpedo grass	*Panicum repens*	n/a	5	FACW
Glasswort	*Salicornia sp.*	n/a	<5	OBL

Quadrat 5; Water depth: 4 - 6"- saturated to surface

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
White mangrove	*Laguncularia racemosa*	10	30	OBL
Black mangrove	*A. germinans*	<5	<5	OBL
Red mangrove	*R. mangle*	<5	<5	OBL
Saltgrass	*D. spicata*	20	45	OBL
Fragrant flatsedge	*C. odoratus*	5	20	FACW
Alligatorweed	*Alternanthera philoxeroides*	<5	<5	OBL
Sea blite	*S. linearis*	5	<5	OBL
Bare ground	*n/a*	5	0	n/a
Blue-green algae	*n/a*	10	0	NI
Herb-of-grace	*B. monnieri*	10	<5	OBL
Fall panicgrass	*P. dichotomiflorum*	25	<5	FACW
Saltwort	*B. maritima*	<5	<5	OBL
Brazilian pepper seedlings	*Schinus terebinthifolius*	n/a	<5	FAC

Quadrat 6; Water Depth: 10 - 12"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
Red mangrove	*R. mangle*	<5 (1 dead)	0	OBL
Open water	*n/a*	100	100	n/a

Table 4, continued

Quadrat 7; Water Depth: 16 - 18"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
Red mangrove	*R. mangle*	<5 (1 dead)	0	OBL
Open water	*n/a*	100	100	n/a

Quadrat 8; Water Depth: 16 - 18"

Common Name	Scientific Name	Percent-Coverage		Vegetative Index
		Baseline Report (04/13)	1st Annual Report (4/14)	
Red mangrove	*R. mangle*	<5	0	OBL
Torpedo grass	*P. repens*	<5	<5	FACW
Open water	*n/a*	95	95	n/a

OBL - Obligate **FAC - Facultative** **FACW - Facultative wet**
UP - Upland **NI - Non-indicator**

in the mitigation area. It was estimated at 50% in Q2, and increased approximately 30% & 35% in Q3 & Q1 respectively. Collectively, cattail exists at approximately 40% coverage throughout the extent of the mitigation area. Other exotic/nuisance species include torpedo grass (*Panicum repens*), which was found at 5% in Q4 and alligatorweed (*Althernanthera philoxeroides),* which increased an estimated 5% in Q3 but declined 10% in Q2. Brazilian pepper seedlings were also present at <5% in Q5.

All of the observed exotic species are aggressive and can quickly out-compete desirable, native vegetation. An exotic and nuisance species management plan must be implemented and continued at routine intervals to efficiently eradicate and/or control these species. Continued treatment of the mitigation area will likely increase recruitment of desirable native vegetation within the mitigation area and aid in remaining in compliance with FDEP Permit #s 56-0255662-001, ERP31-0273920-001-EI and ERP31-0273920-003-EM. Native species recruitment will increase as the cattail is reduced, allowing the mitigation area to flourish.

4.00 CONCLUSIONS/RECOMMENDATIONS

- The northern half of the mitigation area west of the east berm is dominated by native species such as saltgrass and white mangroves, while the southern half is dominated by cattails.
- The mitigation area east of the east berm is dominated by sea oxeye daisy and mangroves on the berm areas, with no previously planted red mangroves existing in the open water areas.
- Native vegetation, such as saltgrass, fragrant flatsedge, glasswort and three square rush are naturally recruiting into the mitigation area.
- Most native vegetation appears healthy and free of insect damage or any other forms of relative stress at the time of this monitoring event. However, it was noted that the black mangroves leaves were being eaten by an unknown insect and there was some webbing on some of the leaves.

- Cattails were observed at an aerial coverage of approximately 40% in the southern half of the western mitigation area. Although this species is native to Florida, it is very aggressive and out competes other desirable native species. Special attention needs be placed on the control/treatment of cattails within the mitigation area, as FDEP treats it as an nuisance species. There is a large seed source of cattail directly adjacent to the mitigation area on the west side of the access road, so maintenance to keep this species under control will need to be on-going.

- Torpedo grass and alligator weed were observed within the mitigation area at <5% total coverage.

- An exotic/nuisance management plan needs to be implemented and maintenance on-going to control the spread of all exotic/nuisance species within the mitigation area.

- FDEP permit success criteria will be met if desirable native vegetation exists at 95% within the mitigation area within five (5) years of the baseline report, and exotic/nuisance vegetation is being maintained at an aerial coverage of less than 5%.

- Not mentioned in the body of the report but of note, numerous wetland dependent avian species were observed utilizing the wetland. These include great blue heron, little blue heron, great egret, snowy egret, roseate spoonbill, red-winged blackbird, osprey, anhinga, wood ducks and blue-winged teals

- The next monitoring event is scheduled to occur in April 2015.

5.00 CERTIFICATION

This report represents a true, accurate and representative description of the activities and site conditions at the time of this report.

Freda R. Posin

Freda R. Posin **5 May 2014**
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