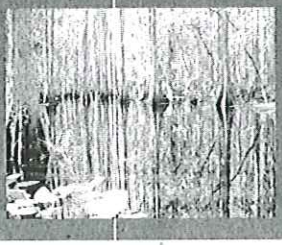
MILLER LEGG

Section 24 Impoundment Mitigation Area



"Improving Communities ... ... Creating Environments"

Time Zero Monitoring Report
June 2010

SFWMD Individual Permit # 50-00548-S
USACOE Permit # SAJ-2009-04238 (NW-DLR)
Miller Legg Project #10-00079

Prepared for:
Village of Wellington

Section 24 Impoundment Mitigation Area
Time Zero Monitoring Report

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I. Project Overview

- SJRWMD Individual Permit # 50-00548-S
- USACOE Permit # SAJ-2004-3561 (IP-MJW)

- **Permittee**: Village of Wellington
  14000 Greenbriar Blvd.
  Wellington, FL, FL 33414
  Phone # (561) 791-4000

- **Consultant**: Miller Legg
  2005 Vista Parkway Suite 100
  West Palm Beach, FL 33411
  Phone # 561-689-1138

- **Field Visit Information**: Reviewed on June 14, 2010

- **Project Summary**: The 364.4 acre Section 24 Impoundment was constructed to temporarily store stormwater and to attenuate flood stages within the Village of Wellington (Drainage Basin B) as well as provide a passive recreation area. Prior to construction, a total of 152.5 aces of the 364.4 acre impoundment area consisted of low quality wetlands within agricultural fields. Construction of the impoundment area resulted in unavoidable impacts to 38.0 acres of freshwater herbaceous wetlands. Mitigation for wetland impacts consisted of a total of 74.5 acres of wetlands creation/enhancement within the impoundment area. The mitigation wetlands are part of the overall 251.5 acres of wetlands present within the impoundment area.

- **Project Location**: The site is located approximately three (3) miles south of Southern Blvd. (SR 80) on the west side of Flying Cow Road within the Village of Wellington, Palm Beach County, Florida.

- **Directions to Mitigation Site**: Florida Turnpike to Southern Blvd.; Southern Blvd west to Flying Cow Rd; Flying Cow Rd. south for three (3) miles (property is on west side of Flying Cow Rd.).

- **Mitigation Completion Date**: June 2010

- **Compliance Status** – Installed and recruited native vegetation is getting established and nuisance coverage is below the threshold.
  - Marsh
    - Desirable herbaceous plant coverage is at ±24% overall
    - Nuisance/exotic plant coverage is ±33% overall
  - Forested
    - Desirable herbaceous plant coverage is at ±37% overall
    - Nuisance/exotic plant coverage is ±2% overall

- **Date of Last Maintenance Activities**: June 2010

- **Maintenance Recommendations**: Significant amounts of hydrilla (*Hydrilla verticillata*) were observed throughout the marsh habitat; this species accounted for ±90% of the overall nuisance/exotic species coverage. Nuisance/exotic species present in lesser abundance include cattail (*Typha* sp.) and torpedo grass (*Panicum* repens). These species will be brought to the attention of the maintenance contractor in order to expedite treatment.

II. Requirements

- Permit Success Criteria
    - A minimum of 80% coverage by desirable wetland species after two (2) years and a demonstration of persistence for three (3) additional years.
    - Less than 5% coverage by invasive exotic and undesirable species is allowable if plants are dispersed and not concentrated in any particular area. Exotic and undesirable species include, but are not limited to melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), bischoffia (*Bischoffia javanica*), torpedo grass (*Panicum repens*), primrose willow (*Ludwigia peruviana*), and cattail (*Typha* sp.). Treatment efforts must be tailored to prevent these species from becoming reproductively mature
    - A minimum of 80% survival of each planted species. This rate shall be maintained each year except where species composition, density of planted and recruited species and overall wetland condition, growth rates and viability of the areas, are of higher quality, as determined by the regulatory agencies
    - Hydrologic conditions and soil characteristics are in general conformity to those specified in the plans. Data from the permanent surveyed staff gauges must be collected every two weeks and submitted with the quarterly monitoring reports.
    - Any preserved/planted species shall be maintained as to exhibit new growth and/or propagation, viability, and overall health.

III. Data Collection Methods

Evaluation of herbaceous vegetation within the marsh and forested transitional areas consisted of quadrat sampling at fixed locations along linear transects (see attached monitoring plan). PVC stakes were placed at each quadrat location to serve as permanent markers. At each sample point, a $1m^2$ PVC quadrat was placed over the PVC stake (with stake in bottom left corner of

quadrat relative to outgoing path of transect). Recruited and planted species present within each quadrat were recorded and the percent cover for each species was visually estimated (see attached data tables).

Within the forested transitional areas, tree species monitoring was separately conducted along 5' wide "belt" transects. The belt transects were in line with the quadrat sampling transects, and the length of each belt transect was the length of forested habitat bisected by the transect in that particular location. All tree species rooted within the belt transects were counted and measured (i.e. spread measurements). Mean spread measurements and counts per species were used to determine percent aerial coverage by trees/shrubs within the transects (see attached data tables)

Wildlife data collection consisted of incidental direct and indirect (i.e. tracks, scat) observations of faunal species within the mitigation areas.

Table 1. Success Criteria Evaluation.

Table 1. Vegetation Success Criteria Evaluation.

Success Criteria	Percent Coverage/Survivorship per Monitoring Period					
	T-0	Year 1	Year 2	Year 3	Year 4	Year 5
80%+ Marsh Hydropyte Cover.	24					
80%+ Surv. Tree/Shrub Species*	100					
<5%* Invasive/Ex. Cover.	18					

Yellow Box = Earliest time period that success criteria must be achieved.

Bold Red = Success criteria not achieved at this time

* = average coverage for both marsh and forested habitats

IV. Incidental Wildlife Observations

The following faunal species were observed during the time-zero monitoring field visit:

Table 2. Incidental Wildlife Observations

BIRDS

SPECIES	COMMON NAME
Agelaius phoeniceus	red-winged blackbird
Anas fulvigula	Florida mottled duck
Anhinga anhinga	anhinga
Aramus guarauna	limpkin
Ardea alba	great egret
Egretta thula	snowy egret
Gallinula chloropus	moorhen
Himantopus mexicanus	black necked stilt
Pandion haliaetus	osprey
Quiscalus major	boat-tailed grackle

FISH

Gambusia sp.	mosquitofish

INVERTEBRATES

Order Odonata, Sub-Order Anisoptera	dragonflies, several species
Pomacea sp.	apple snail (shells and eggs)

V. Conclusions

Coverage by desirable, native hydrophytes within the marsh area is at ±24%. Species present in relatively high abundance include waterweed (*Elodea* sp.), pickerelweed (*Pontedaria cordata*), spikerush (*Eleocharis cellulosa*), and soft stemmed bulrush (*Scirpus* validus). Coverage by nuisance/exotic species is currently at 33%, composed almost exclusively of hydrilla (*Hydrilla verticillata*), a highly invasive submersed aquatic species. The presence of this species will be brought to the attention of the maintenance contractor as soon as possible in order to expedite treatment.

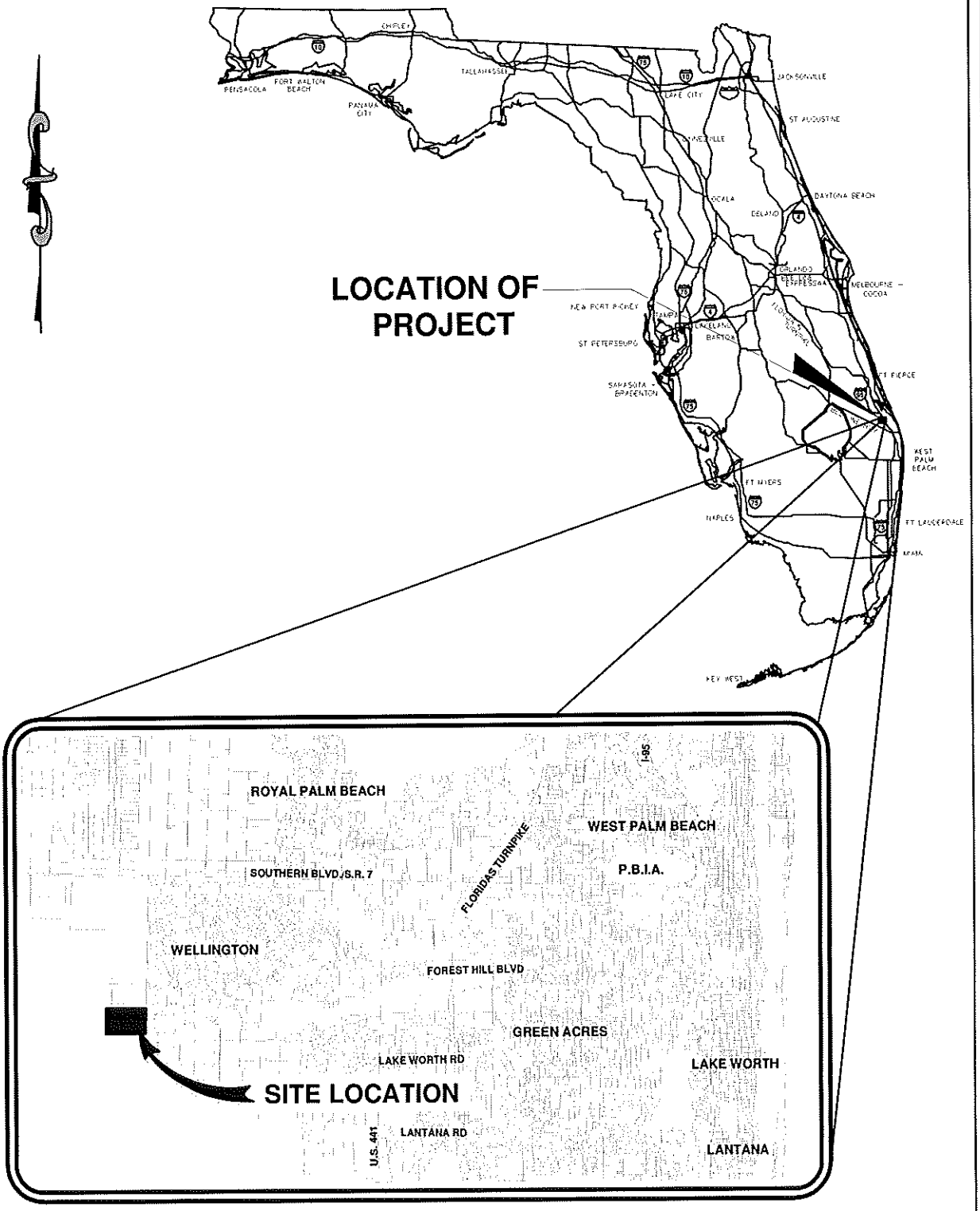
Within the forested habitats (wetland tree islands and perimeter uplands), installed tree and shrub species are displaying excellent health and survivorship, with no tree mortalities recorded within the sampling transects during this monitoring period. Although several tree islands displayed a small number of fallen trees, the maintenance contractor was observed re-staking fallen trees during the field visit for this report.

Coverage by desirable, herbaceous species within the understory stratum of the forested habitats is at 37%. Species present in relatively high abundance include redtop grass (*Panicum*

rigidulum), panic grass (*Panicum* spp.), soft stemmed bulrush (*Scirpus validus*), sedge (*Cyperus* sp.), and barnyard grass (*Echinochloa* sp.). Coverage by nuisance/exotic species is negligible (±2%) within the forested habitats, composed of minor amounts of torpedo grass (*Panicum repens*), primrose willow (*Ludwigia peruviana*), and cow pea vine (*Vigna luteola*).

The wetland communities are beginning to become established and are already providing habitat for various wildlife species (see "Incidental Wildlife" section).

Overall the mitigation area appears to be doing fairly well. Installed plant species are displaying high survivorship and steady growth within both the marsh and forested habitats, and additional desirable species have already begun to recruit within these habitats. Coverage by nuisance/exotic species is essentially limited to the marsh areas; however, coverage by hydrilla is very high in the marsh areas. The presence of this species will be brought to the attention of both the Village of Wellington and the maintenance contractor to ensure that eradication efforts are started as soon as possible.



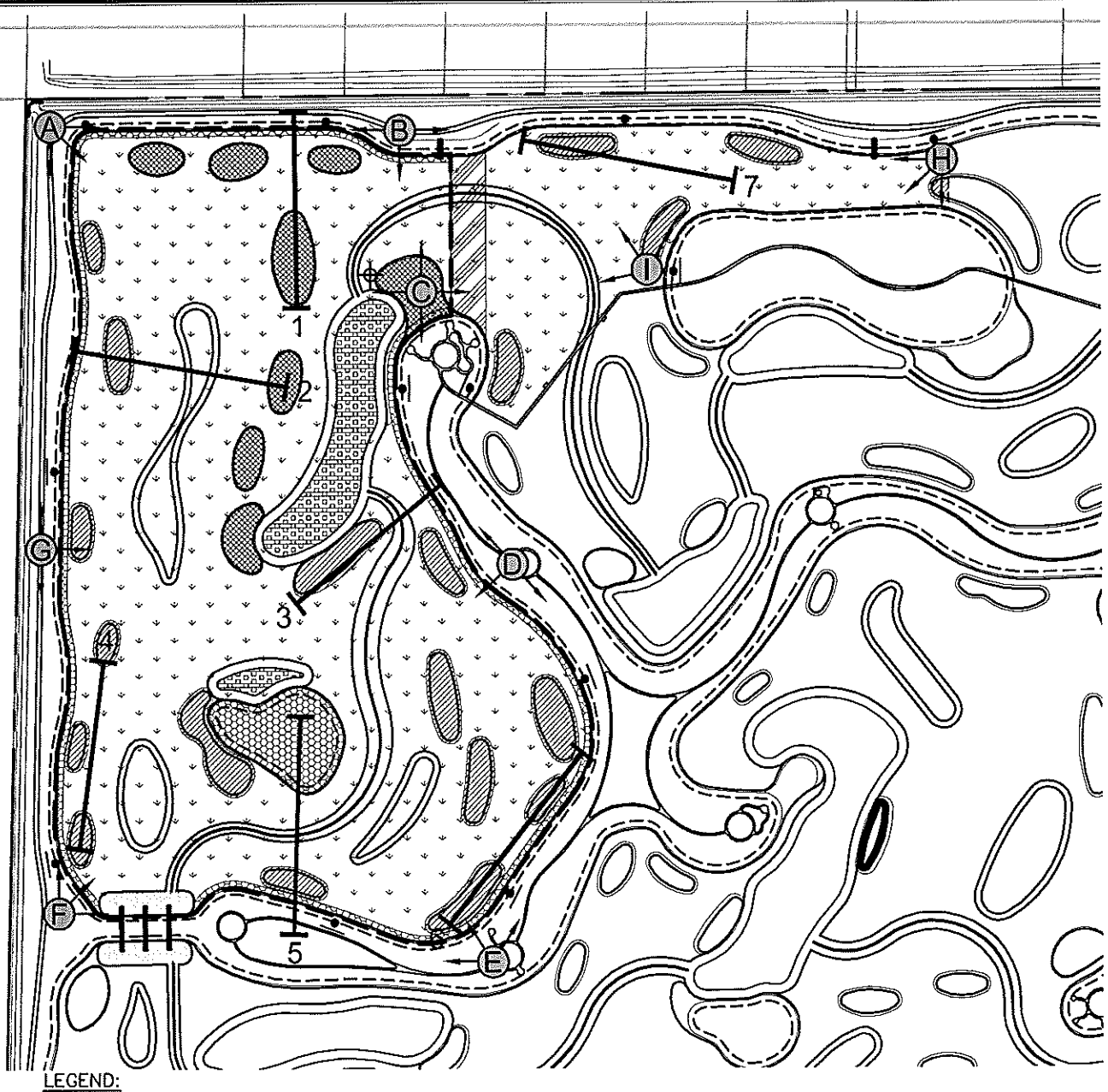
LOCATION MAP

N.T.S.

Coordinate System:

Project/File No.: 08-00096	MILLER LEGG Palm Beach Office: 2005 Vista Parkway - Suite 100 West Palm Beach, Florida - 33411-2719 561-689-1138 - Fax: 561-689-8108 www.millerlegg.com	**SECTION 24 IMPOUNDMENT** PALM BEACH COUNTY, FL FOR: VILLAGE OF WELLINGTON	*FIG #1* *LOCATION MAP*
Twp/Rng/Sec: 44S/40E/24			
Date Drawn: 3/26/08			

V:\PROJECTS\2008\08-00096 - SECTION 24 IMPOUNDMENT\DRAWINGS\ENVIRONMENTAL PERMITTING\PERMIT SKETCHES-MP.DWG 11/20/08 by CMALPHUR



LEGEND:

- PROJECT BOUNDARY
- SJRWMD / USACE MITIGATION BOUNDARY
- USACE ADDITIONAL MITIGATION BOUNDARY

	SFWMD REQUIRED MITIGATION (ACRES)	USACE REQUIRED MITIGATION (ACRES)
25' UPLAND BUFFER & UPLAND TREE ISLAND	6.0	6.0
MARSH	54.8	67.1
CYPRESS DOMES	6.7	8.5
BAY HEADS	3.9	3.9
DEEP WATER REFUGIA	3.1	3.1
WETLAND BUFFER AREA	1.4	1.4

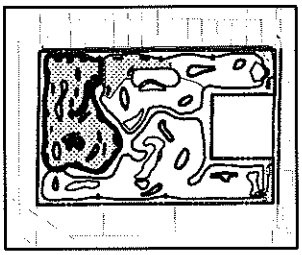
- MITIGATION SIGN
- TRANSECT
- STAFF GAUGE/MONITORING WELL
- PHOTO STATION

0 250 500

GRAPHIC SCALE
1 INCH =500FEET

NOTE:

PERMIT SET – REVIEW CONSTRUCTION LEVEL SPECIFICATIONS PRIOR TO COMMENCING CONSTRUCTION ACTIVITY



MITIGATION PLAN

MILLER LEGG
Palm Beach Office: 2005 Vista Parkway - Suite 100
West Palm Beach, Florida - 33411-2719
561-689-1138 - Fax: 561-689-8108
www.millerlegg.com

SECTION 24 IMPOUNDMENT

PALM BEACH COUNTY, FLORIDA
FOR: VILLAGE OF WELLINGTON

REVISIONS

08-00096
MP-1
35
42

Table 1

Section 24 Impoundment Mitigation Area. Time Zero Monitoring Report. June 2010

Marsh Transects - Herbaceous Quadrat Data and Mean Percent Coverages

		TRANSECT 1				TRANSECT 2							TRANSECT 3				TRANSECT 4					TRANSECT 5			TRANSECT 6			TRANSECT 7						
SPECIES	**COMMON NAME**	A	B	C	E	A	B	C	D	E	F	G	A	B	C	F	C	D	E	F	G	A	B	C	D	E	G	A	B	C	D	E	F	**MEAN**
Chara sp.	muskgrass			5	10	15													2								5						1.2
Cyperus sp.	sedge																											1						0.0
Echinocloa crusgali	barnyard grass												4																					0.1
Eclipta alba	yerba de tajo							5					10																					0.5
Eleocharis cellulosa	spikerush	75																		9	7													2.8
Elodea sp.	waterweed						2		25	15					25	5		55	2	40							5			60	40			8.6
Hydrocotyle umbellata	marsh pennywort											3										3												0.1
Iris virginica	southern blue flag																																	0.1
Panicum sp.	panic grass																																	0.0
Panicum rigidulum	redtop grass											10	5													15								0.9
Pontederia cordata	pickerelweed				25	20							1					40			35		10	8									4.3
Sagittaria lancifolia	duck potato			6	25		20				5										1													1.8
Sagittaria lattofolia	arrowhead				1															10														0.3
Salix caroliniana	coastal plain willow												5																					0.2
Scirpus californicus	giant bulrush																																	0.0
Scirpus validus	soft stemmed bulrush				1												55		30															2.7
Thalia geniculata	firellag																									25								0.8
	TOTAL	75	0	11	62	35	22	5	25	15	5	13	25	0	25	5	55	95	34	59	43	3	10	8	0	40	10	1	0	60	40	0	0	24.4
EXOTIC/NUSIANCE SPECIES																																		
Alternanthera philoxeroides	alligatorweed			1								5																						0.2
Hydrilla verticillata	hydrilla		100	88	35	15		15	50	80	93	20																99	100	40	30	99	98	30.1
Ludwigia peruviana	primrose willow																				15					45								1.9
Panicum repens	torpedo grass																										11							0.3
Typha sp.	cattail				3		2	5			2	10													3		2					1	2	0.9
	TOTAL	0	100	89	38	15	2	20	50	80	95	35	0	0	0	0	0	0	0	0	15	0	0	0	3	45	13	99	100	40	30	100	100	33.4
Non-vegetated and/or Open Water		25	0	0	0	50	76	75	25	5	0	52	75	100	75	95	45	5	66	41	42	97	90	92	97	15	77	0	0	0	30	0	0	42.2
	TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100.0

Table 2

Section 24 Impoundment Mitigation Area. Time Zero Monitoring Report. June 2010

Forested Wetland Transects - Herbaceous Quadrat Data and Mean Percent Coverages

		TRANSECT 1	TRANSECT 3		TRANSECT 4		TRANSECT 6		
SPECIES	**COMMON NAME**	D	D	E	A	B	C	F	**MEAN**
Ambrosia artemisifolia	commom ragweed						1		0.1
Cephalanthus occidentalis	buttonbush		4	2			3		1.3
Cyperus sp.	sedge						2	25	3.9
Echinocloa crusgali	barnyard grass	35	15	10					8.6
Eclipta alba	yerba de tajo		3				3	10	2.3
Ludwigia sp.	water primrose								0.0
Panicum sp.	panic grass		20	15		10			6.4
Panicum rigidulum	redtop grass	30						10	5.7
Pluchea odorata	marsh fleabane						3		0.4
Scirpus validus	soft stemmed bulrush					55			7.9
	TOTAL	65	42	27	0	65	11	45	36.4
EXOTIC/NUSIANCE SPECIES									
Ludwigia peruviana	primrose willow		1				4		0.7
Panicum repens	torpedo grass						20		2.9
	TOTAL	0	1	0	0	0	24	0	3.6
Non-vegetated and/or Open Water		35	57	73	100	35	65	55	60.0
	TOTAL	100	100	100	100	100	100	100	100.0

Forested Upland Transects - Herbaceous Quadrat Data and Mean Percent Coverages

		TRANSECT 5		
SPECIES	**COMMON NAME**	D	E	**MEAN**
Ambrosia artemisifolia	commom ragweed			0.0
Cephalanthus occidentalis	buttonbush			0.0
Chamaesyce sp.	spurge		2	1.0
Chyrsobalanus icaco	cocoplum seedling		4	2.0
Cyperus sp.	sedge	5		2.5
Echinocloa crusgali	barnyard grass			0.0
Eclipta alba	yerba de tajo			0.0
Ludwigia sp.	water primrose			0.0
Myrsine guianensis	myrsine seedling		25	12.5
Panicum sp.	panic grass			0.0
Panicum rigidulum	redtop grass	18	10	14.0
Pluchea odorata	marsh fleabane	2		1.0
Scirpus validus	soft stemmed bulrush	7		3.5
Unid. Poaceae	grass sp.	3		1.5
	TOTAL	35	41	38.0
EXOTIC/NUSIANCE SPECIES				
Vigna luteola	cow pea vine	1		0.5
	TOTAL			0.5
Non-vegetated and/or Open Water		65	59	62.0
	TOTAL	100	100	100.0

TABLE 3

Section 24 Impoundment Mitigation Area. Time Zero Monitoring Report. June 2010
Forested Transects - Tree Data (Survivorship and Percent Aerial Coverage)

Forested Transect No.	Tree/Shrub Species Scientific Name	Tree/Shrub Species Common Name	Quantity Installed in Transect	Quantity Surviving	Survivorship Rates	Mean Spread (ft.)	Estimated Aerial Coverage by Species (ft2)	Transect Area (5 ft. Width, Length Varies)	Total Percent Aerial Coverage
Transect 1 (Forested Wetland/Tree Island)	*Acer rubrum*	red maple	2	2	100%	5.3	44.1	1300.0	13%
	Ilex cassine	dahoon holly	1	1	100%	5.0	19.6		
	Magnolia virginica	sweet bay	5	5	100%	5.1	102.1		
	Persea paulustris	swamp bay	3	3	100%	0.8	1.5		
	Totals		**11**	**11**	**100%**		**167.3**		
Transect 2 (Forested Wetland/Tree Island)	*Cephalanthus occidentalis*	buttonbush	2	2	100%	0.6	0.6	500.0	5%
	Taxodium distichum	bald cypress	5	5	100%	2.5	24.5		
	Totals		**7**	**7**	**100%**		**25.1**		
Transect 3 (Forested Wetland/Tree Island)	*Acer rubrum*	red maple	2	2	100%	7.0	76.9	1430.0	15%
	Ilex cassine	dahoon holly	1	1	100%	3.8	11.0		
	Taxodium distichum	bald cypress	27	27	100%	2.5	132.5		
	Totals		**30**	**30**	**100%**		**220.4**		
Transect 4 (Forested Wetland/Tree Island)	*Taxodium distichum*	bald cypress	8	8	100%	6.6	273.6	650.0	42%
	Totals		**8**	**8**	**100%**		**273.6**		
Transect 5 (Forested Upland	*Ilex cassine*	dahoon holly	3	3	100%	4.3	43.5	500.0	9%
	Totals		**3**	**3**	**100%**		**43.5**		
Transect 5 (Forested Wetland/Tree Island)	*Acer rubrum*	red maple	1	1	100%	6.0	28.3	200.0	25%
	Ilex cassine	dahoon holly	1	1	100%	4.5	15.9		
	Taxodium distichum	bald cypress	1	1	100%	2.5	4.9		
	Totals		**1**	**1**	**100%**		**49.1**		
Transect 6 (Forested Wetland/Tree Island - Segment 1)	*Acer rubrum*	red maple	1	1	100%	6.0	28.3	750.0	16%
	Ilex cassine	dahoon holly	1	1	100%	4.0	12.6		
	Taxodium distichum	bald cypress	13	13	100%	2.8	80.0		
	Totals		**15**	**15**	**100%**		**120.8**		
Transect 6 (Forested Wetland/Tree Island - Segment 2)	*Ilex cassine*	dahoon holly	3	3	100%	4.8	54.3	850.0	11%
	Taxodium distichum	bald cypress	3	3	100%	4.1	39.6		
	Totals		**6**	**6**	**100%**		**93.8**		
	OVERALL TOTALS		**81**	**81**	**100%**				**17.0%**

Section 24 Impoundment Mitigation Area

Time Zero Monitoring Report – June 2010

Photo-Station A, viewing southeast

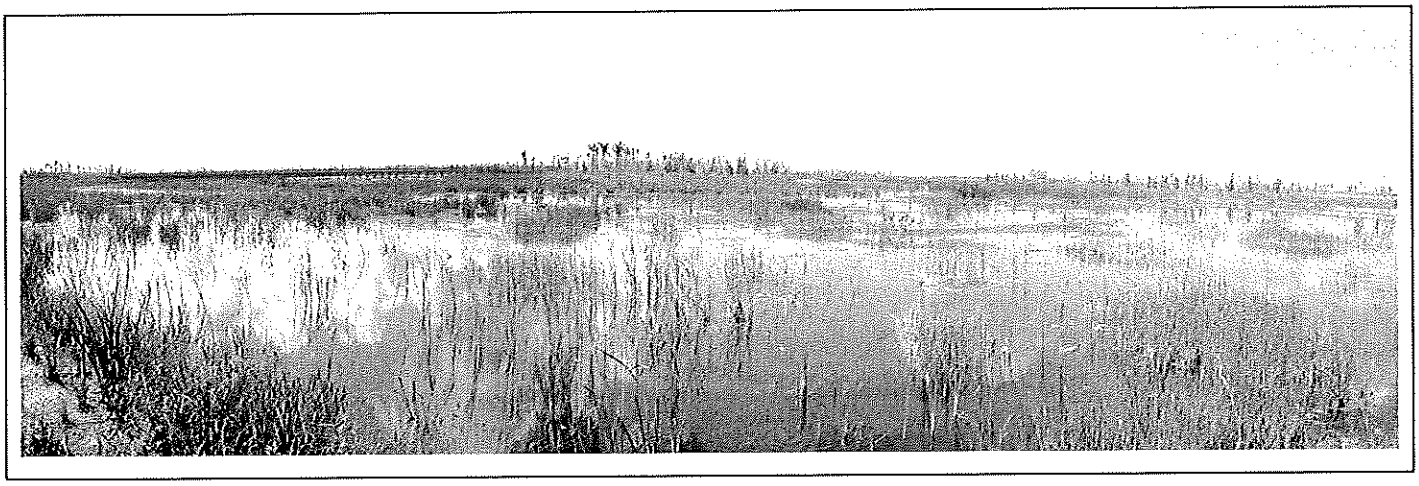


Photo-Station B, viewing south

Photo-Station C, viewing north

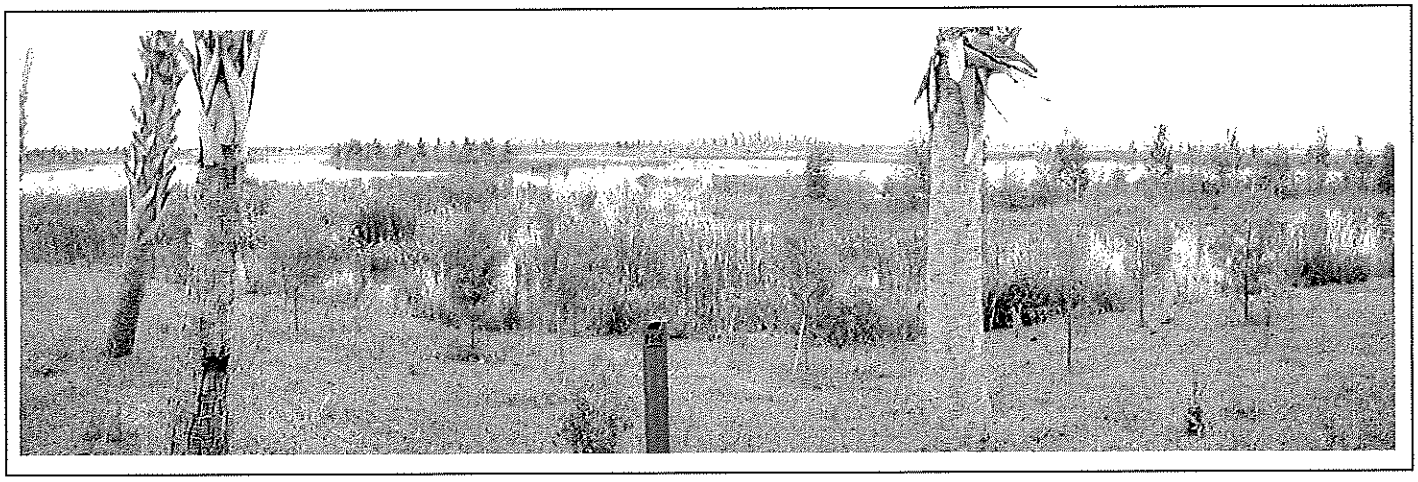


Photo-Station D, viewing southwest

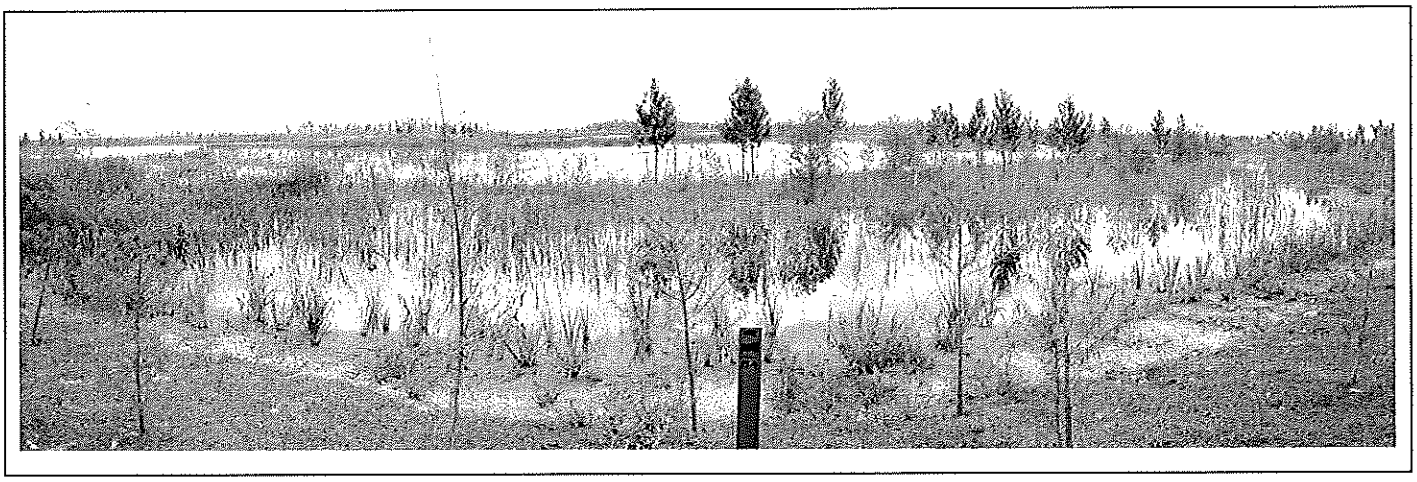


Photo-Station E, viewing northwest

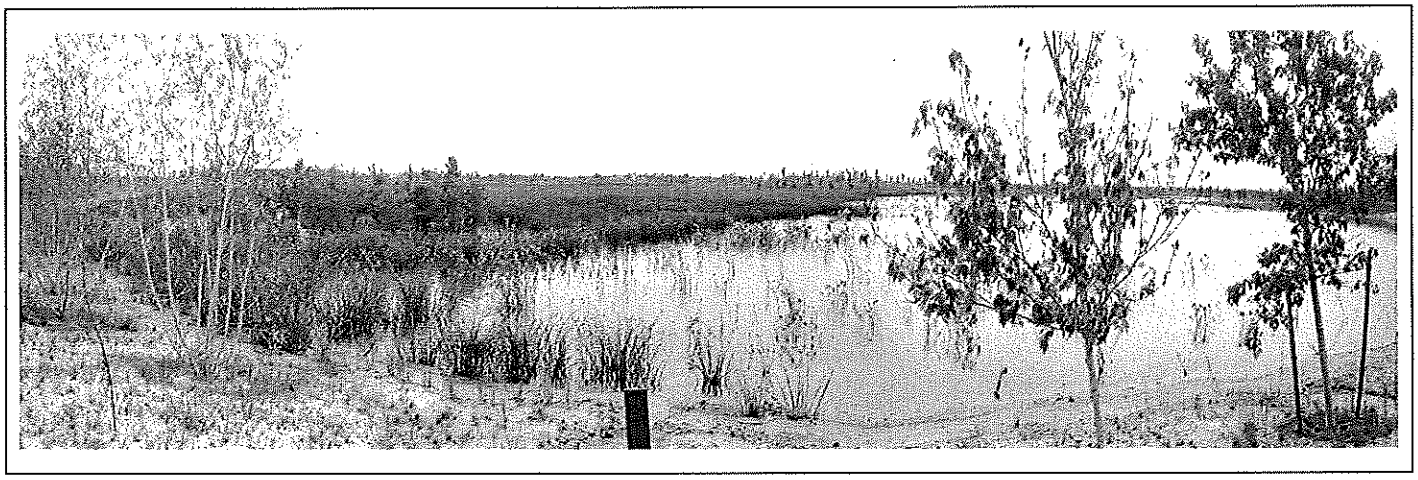


Photo-Station F, viewing northeast

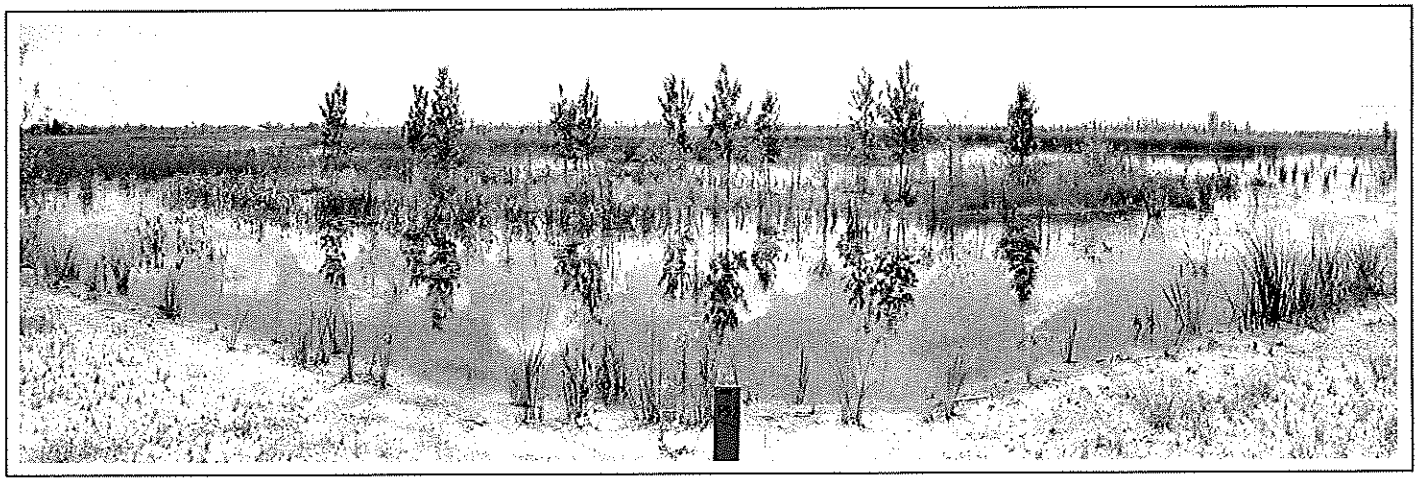


Photo-Station G, viewing east

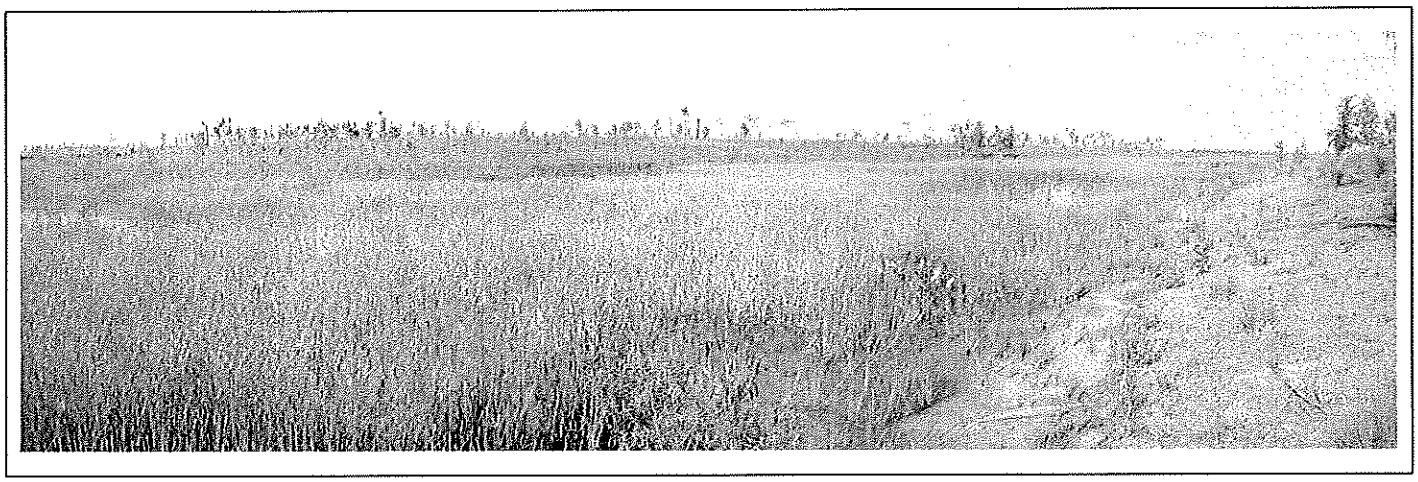
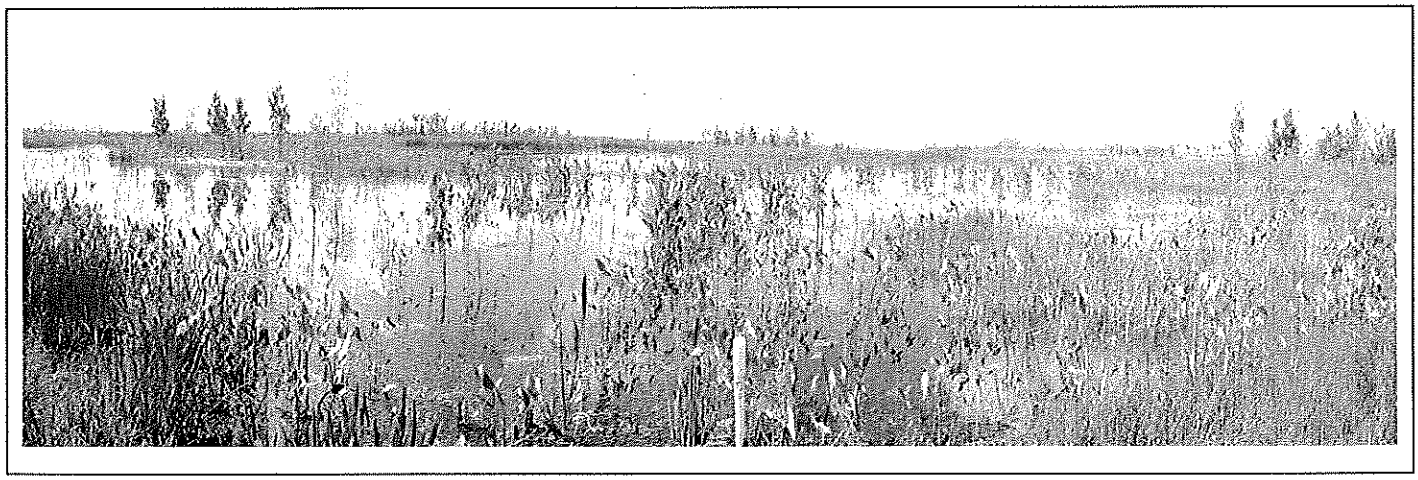


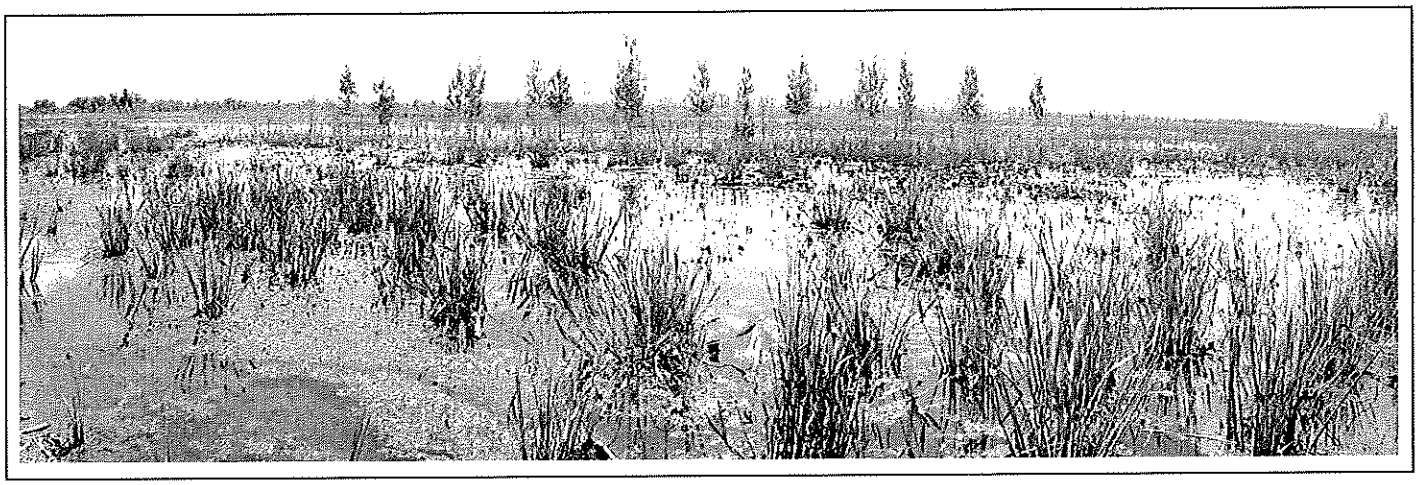
Photo-Station H, viewing west



Overview of Transect 1, facing south

Section 24 Impoundment Mitigation Area

Time Zero Monitoring Report – June 2010



Overview of Transect 2, facing east

Overview of Transect 3, facing southwest

This Transect panoramic photo was corrupted – will include in Year 1 report

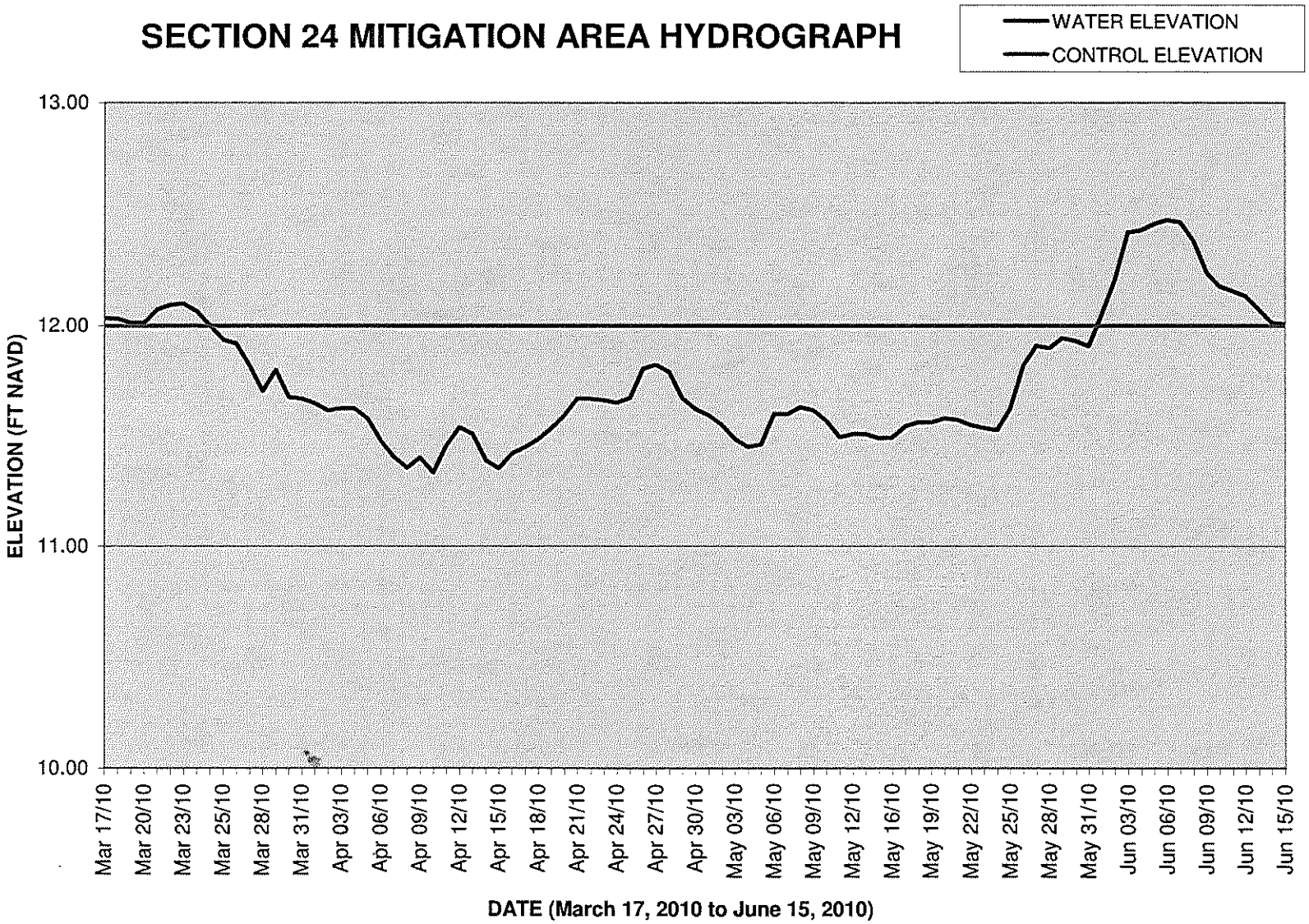
Overview of Transect 4, facing north

This Transect panoramic photo was corrupted – will include in Year 1 report

Overview of Transect 5, facing north

This Transect panoramic photo was corrupted – will include in Year 1 report

Overview of Transect 6, facing northeast

Overview of Transect 7, facing east

SECTION 24 MITIGATION AREA HYDROGRAPH