

## THIRD MONITORING REPORT NARRATIVE. FEBRUARY OF 2016

### 1. Project Overview

- a. Corps Permit Number: SJA-2008-00123 (IP-CGR). Compensatory Wetland Mitigation Plan. Río de La Plata Flood Control Project, Dorado, Puerto Rico.
- b. Fernando Payan, Subcontractor from Habitat, is the responsible party for conducting the monitoring. Dates the inspection was conducted: To be determined upon completion of planting.
- c. The long-term goal of the mitigation plan is to provide self-sustaining, high quality mangrove, herbaceous and estuarine open water wetland habitats to increase the overall health of the ecosystem including the estuary and adjacent reefs. The mitigation project proposes a significant increase in estuarine habitat. This has the potential to improve the diversity, biomass, and production of the inshore reef immediately adjacent to the river mouth and has the potential to improve the general ecological wellbeing of this area. The mitigation plan proposes approximately 21.30 acres of mangrove habitat creation west of the river mouth. The creation areas west of the river mouth would tie into existing. The mitigation plan proposes approximately 53.70 acres of herbaceous habitat creation/enhancement located east of the river mouth and a small portion at parcel number 1 along the west bank of the river. The areas designated for the establishment of herbaceous
- d. The proposed 10-acre estuarine lagoon would be located North of the Mameyal ditch and within the mangrove creation site West of the river mouth. The lagoon would tie directly to the existing linear depression and the Rio de la Plata via a 100-ft wide channel extending off the East side of the lagoon basin. For detailed information please refer to the Plans for Construction of Flood Damage Reduction Project Contract 1A, drawings C3-10 to C3-12 and C3-40 to C3-42.
- e. **The compensatory mitigation project commenced on October 24, 2011 and was completed on October 15, 2014**
- f. The mitigation project conducted at Rio La Plata Flood Control Project met the performance standards of a minimum of 80% survival of mangroves and herbaceous vegetation required for two years after initial planting.
- g. **During 2014, Habitat has been making corrective actions and maintenance activity 3 to 4 times a week, even though this is the third report submission.**
- h. **The USACE provide instructions for Parcel #4, to control unwanted, nuisance species as requested, so that this last maintenance was completed on March 12, 2015. Habitat also includes the others parcel that need more maintenance.**

## 2. Requirements

a. Vegetation monitoring should be performed to document the establishment and cover of the planted species, and to document the presence and cover of unwanted, nuisance species. The vegetation monitoring should occur in at least, eight locations (plots) within the mitigation, including the planted edge of the estuarine lagoon. These locations shall represent site conditions and should be representative areas of the mitigation planting sites. The dimensions of each plot should be at least 5 meters by 5 meters. The Contractor shall perform the following actions during monitoring:

1) Monitoring data such as; estimated cover by species, estimate of survival of planting, average height of planted species, casual observations, survival rates and identification of nuisance species, shall be recorded on a standardized form during monitoring events. In addition, monitoring will also detail observations regarding the hydrologic connectivity to the river, sedimentation and flushing of the estuarine lagoon.

2) Permanent monitoring and photographic stations will be established at the mitigation site. The stations' location coordinates shall be provided. At least, four photographs of the mitigation sites from each control points facing north, east, south and west must be provided.

3) Monitoring and photographic stations' identification markers should be maintained for location reference during successive monitoring.

4) Monitoring reports shall include photographic documentation of the site.

b. The mitigation project conducted at Rio La Plata Flood Control Project must meet the performance standards of a minimum of 80% survival of mangroves and herbaceous vegetation required for two years after initial planting.

c. The Contractor shall submit monitoring reports for the USACE Technical POCs review. The monitoring reports shall be prepared in accordance with the USACE Regulatory Guidance Letter 08-03 and shall be submitted as follows:

1) The Contractor shall submit a time-zero monitoring report within 30 days of planting completion.

2) Monitoring and reports should be performed every three months after planting completion, during two (2) years.

3) The monitoring reports shall be submitted no later than 30 days from completion of the monitoring event.

- 4) A closeout monitoring report shall be performed two years after planting completion.

### 3. Summary Data:

The Compensatory Wetland Mitigation Plan for the Rio La Plata Flood control Project was divided in eight (8) Parcels (See attached table of parcels). The planting of the species for each parcel was conducted according to the availability of the parcels to do the mitigations and according to the USACE specifications. The planting order was as following:

- 1) Parcel #6: Species to be planted: *Laguncularia racemosa* (White mangroves) and *Avicennia germinas* (Black mangroves). They were planted according to the specifications of the mitigation projects. The planting began on the 24<sup>th</sup> of October of 2011 and ended in January of 2012. Since the last monitoring report (second) the mangroves (white and black) are getting tallest and spreading all over the parcels. Some areas continue to be destroyed by 4x4 vehicles (jeeps and four tracks). The people made roads for these vehicles. The development of the parcel is illustrated in appendix No. 1
- 2) Parcel #7 (Estuarine Lagoon): Specie to be planted: *Rhizophora mangle* (Red mangrove). They were planted according to the specifications of the mitigation projects. The planting began on the 30<sup>th</sup> of November 2011 and ended in December of 2011. The environmental conditions, types of soils and grade of the site continue to be optimal for the development of these red mangroves. There is a significant increase in aquatic, terrestrial and aerial life of the area. See Appendix No. 2
- 3) Parcel #8: Species to be planted: *Laguncularia racemosa* (White mangroves) and *Avicennia germinas* (Black mangroves). They were planted according to the specifications of the mitigation projects. There were different planting period according to the availability of the areas. The planting began in December of 2011; The Second period in June of 2012; Another in November of 2012; and the last one in October 2014. In general, the development of the species are good (most of them has more then 7 feet tall) but in some areas are not big enough or well development because of the condition of soil and animal or people that damaged the areas. See Appendix No. 3.
- 4) Parcel #5: Species to be planted: *Laguncularia racemosa* (White mangroves) and *Avicennia germinas* (Black mangroves). They were planted according to the specifications of the mitigation projects. The planting was completed between May 10 & 12 of 2012. The environmental conditions, the soil and grade of the site were very good. This parcel continues to be the best of all areas. It indicates us that the most suitable conditions to grow mangrove are near a river or a source of water and very close to the water table. See Appendix No. 4.
- 5) Parcel #3: Species to be planted: *Paspalidum germinatum*, *Spartina*. They were planted according to the specifications of the mitigation projects. However, a

change of species to be planted in Parcel #3 was required, due to the environmental conditions found. USACE approved the change, *Paspalidum* for *Eleocharis*. There were different planting period according to the availability of the areas. The planting began in June of 2012 and was basically completed by August 2013. The species planted in this parcels are progressing towards meeting its performance standards. In some areas (near the border of the parcel) are growing *Laguncularia racemosa* (White mangroves) See Appendix No. 5. The north area of this parcel was completely destroyed by people. They go in 4x4 jeeps and four tracks during the weekend.

- 6) Parcel #4: The species planted were *Paspalidum germinatum*, *Spartina* and *Eleocharis* and *Cyperus*. There were different planting period according to the availability of the areas. The planting began in August of 2012 and it was finished on October of 2014. The herbaceous vegetation besides control erosion and filter water is providing habitat for aquatic organism (fish, crabs, insects and birds). During wet season we can see new development of the herbaceous species because of the seeds producing during its growing periods. Appendix No. 6
- 7) Parcel #1: Like the Parcels 6, 8 and 5 the species to be planted were *Laguncularia racemosa* (White mangroves) and *Avicennia germinas* (Black mangroves) and *Spartina*. Planting following the specifications of the mitigation project. Planting of mangrove species began in November of 2013 and finished in December of 2013. The mangroves are the development good and producing seeds specially the white mangroves. The *Spartina* was planted in August and September of 2014. This species (*Spartina*) are development very good. The development of the mangroves can be see in Appendix No. 7
- 8) Parcel #2: The species to be planted in this area was *Acrostichum* (a type of fern). The planting period began in August of 2012, but was not completed due to the harsh sunlight other environmental conditions. The plants did not do well at all. A request for a change was made and finally approved. *Paspalidum Germinatum* was planted and immediately completed. There is a good development of the *Acrostichum* planted near the mangroves and where they are not exposed to full sun. The *Paspalidum* developed very well. See Appendix No. 8

#### 4. Maps and Plans

- 1) TABLE NO. 1 – COMPENSATORY WETLAND MITIGATION PARCELS (See Annex A). This annex shows the parcels, their principal coordinates, each area (in square meters) and in acres, together with the completion dates of each parcel.
- 2) WEST SIDE MAP & EAST SIDE MAPS (See Annex B). These maps of the Parcels show their location, their size and their Monitoring & Photographic Sites (all except for Parcel #2 & #5, due to their lack of accessibility to vehicular traffic).

## 5. Conclusions

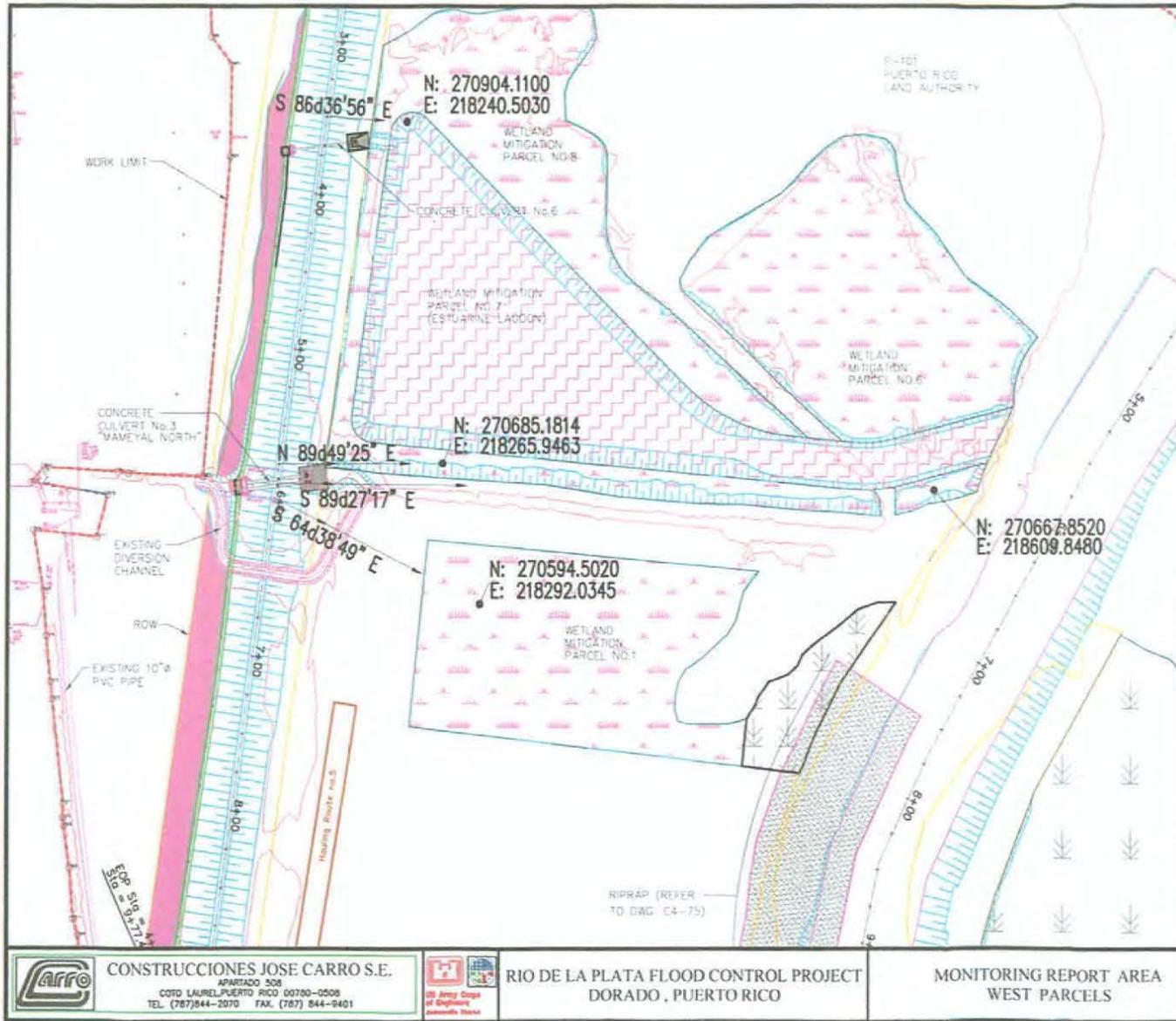
1. The compensatory wetland mitigation plan has continue to met the performance standards of 80% survival of the plants as illustrated in Table No. 2 of the first monitory report (December, 17 2014). Parcel No. 5 are the best of all it is almost 100% and the mangroves are the bigger of the project.
2. The results in the development of species planted in the Project and observations continue to support the recommendations of our last report. (Point 2 of the Conclusions).
3. Other recommendations are about the soil type. Mangrove species do best when the soil is more sandy. This was observed by comparing the development of mangrove trees in the plots. 6 and 5 plots the soil is sandy while Parcel 8 is quite clay soil.
4. The biggest mangroves are producing more seed that will permit the growth of additional mangroves and allow the spread of these species in the parcels such us the herbaceous vegetation.

**ANNEX A - TABLE NO. 1**  
**COMPENSATORY WETLAND MITIGATION PARCELS**  
**RIO DE LA PLATA FLOOD CONTROL PROJECT**  
**DORADO, PUERTO RICO**

NAD 83 PARCEL NO.	POINT	N COORD.	E COORD.	AREA (SM)	AREA (ACRE)	DATES COMPLE TED
1	3001B	270,528.4345	218,215.0624	30,286.39	7.48	Dec-13 & Sep-14
	3001C	270,638.6179	218,226.9582			
	3006	270,595.6752	218,583.1853			
	3002A	270,496.5851	218,508.3590			
2	3030	270,594.4329	218,790.5306	2,603.11	0.64	Aug-13
	3034	270,664.3423	218,829.2983			
	3038	270,646.9351	218,855.4244			
	3043	270,583.4832	218,802.8913			
3	3105	270,559.9248	218,833.5937	46,919.37	11.59	Oct-14
	3068	270,799.9979	218,905.6792			
	3085	270,541.8776	219,112.5800			
	3087	270,410.4572	219,080.3039			
4	3129	269,984.0855	218,832.6548	163,371.74	40.37	May-12
	3110	270,574.8734	218,741.2965			
	3125	270,397.3813	219,077.6632			
	3128	269,952.5949	219,001.3597			
5	3151	270,652.1303	218,582.3959	1,072.07	0.26	Jan-12
	3149	270,668.5842	218,582.6380			
	3159	270,685.8975	218,646.7920			
	3157	270,666.7768	218,639.7291			
6	3184	270,804.3859	218,431.9790	28,329.77	7.00	Dec-11
	3167	270,896.2307	218,560.9554			
	3174	270,787.1599	218,682.6474			
	3178	270,698.9530	218,552.8305			
7	3197	270,716.0199	218,202.0893	39,979.73	9.88	Oct-14
	3198	270,897.4345	218,228.9671			
	3192	270,706.7001	218,657.5160			
	3219	270,682.1014	218,183.4735			
8	3218	270,954.4717	218,223.5283	<u>30,951.76</u>	<u>7.65</u>	
	3211	270,981.1392	218,367.9318			
	3200	270,787.2467	218,420.5188			
TOTALS				343,513.93	84.88	



WEST PARCELS



CONSTRUCCIONES JOSE CARRO S.E.  
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RIO DE LA PLATA FLOOD CONTROL PROJECT  
 DORADO, PUERTO RICO

MONITORING REPORT AREA  
 WEST PARCELS

APPENDIX No. 1 – PARCEL No. 6

White and Black Mangroves



APPENDIX No. 1 – PARCEL No. 6

White and Black Mangroves



APPENDIX No. 1 – PARCEL No. 6

White and Black Mangroves



APPENDIX No. 1 – PARCEL No. 6

White and Black Mangroves



APPENDIX No. 2 - PARCEL NO. 7 - Estuarine Lagoon

Rhizophora mangle - Red Mangrove



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Rhizophora mangle – Red Mangrove



APPENDIX No. 2 – PARCEL NO. 7 – Estuarine Lagoon

Rhizophora mangle – Red Mangrove



APPENDIX No. 2 - PARCEL NO. 7 - Estuarine Lagoon

*Rhizophora mangle* - Red Mangrove



APPENDIX No. 3 – PARCEL No. 8

White and Black Mongroves.



APPENDIX No. 3 – PARCEL No. 8

White and Black Mangroves.



APPENDIX No. 3 – PARCEL No. 8

White and Black Mongroves.



APPENDIX No. 3 – PARCEL No. 8

White and Black Mangroves.



APPENDIX No. 4 – PARCEL No. 5

White and Black Mongroves.



APPENDIX No. 4 – PARCEL No. 5

White and Black Mangroves.



APPENDIX No. 5- PARCEL No. 3

*Paspalidum germinatum*, *Eleocharis* and *Spartina*



APPENDIX No. 5- PARCEL No. 3

*Paspalidum germinatum*, *Eleocharis* and *Spartina*



APPENDIX No. 5- PARCEL No. 3

*Paspalidum germinatum*, *Eleocharis* and *Spartina*



APPENDIX No. 5- PARCEL No. 3

*Paspalidum germinatum*, *Eleocharis* and *Spartina*



APPENDIX No. 6- PARCEL No. 4

*Paspalidum germinatum*, *Eleocharis*, *Spartina* and *Cyperus*



APPENDIX No. 6- PARCEL No. 4

*Paspalidum germinatum*, *Eleocharis*, *Spartina* and *Cyperus*



APPENDIX No. 6- PARCEL No. 4

*Paspalidum germinatum*, *Eleocharis*, *Spartina* and *Cyperus*



APPENDIX No. 6- PARCEL No. 4

*Paspalum germinatum*, *Eleocharis*, *Spartina* and *Cyperus*



APPENDIX No. 7- PARCEL No. 1

White and Black Mangrove and Spartina



APPENDIX No. 7- PARCEL No. 1

White and Black Mangrove and Spartina



APPENDIX No. 7- PARCEL No. 1

White and Black Mangrove and Spartina



APPENDIX No. 7- PARCEL No. 1

White and Black Mangrove and Spartina



APPENDIX NO. 8 – PARCEL No. 5

Acrostichum and Paspalidum



APPENDIX NO. 8 – PARCEL No. 5

Acrostichum and Paspalidum



APPENDIX NO. 8 – PARCEL No. 5

Acrostichum and Paspalidum

