



**State of Louisiana
Department of Natural Resources
Coastal Restoration Division and
Coastal Engineering Division**

2004 Operations, Maintenance, and Monitoring Report

for

VEGETATIVE PLANTINGS OF A DREDGED MATERIAL DISPOSAL SITE ON GRAND TERRE ISLAND

State Project Number BA-28
Priority Project List 7

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Operations, Maintenance, and Monitoring Report
For
Vegetative Plantings of a Dredged Material Disposal Site
on Grand Terre Island (BA-28)

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I. Introduction

The Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) project is located on the eastern end of West Grand Terre Island, centered at Latitude 29°17'15" north, Longitude 89°55'00" west, in Jefferson Parish, Louisiana (figure 1). It is approximately 50 mi (80 km) south-southwest of New Orleans. It is bounded on the north by Barataria Bay, on the south by the Gulf of Mexico, and on the east by Pass Abel. The project area is located within an area approximately 200 acres (80.9 ha) in size. The project area contains shallow water, intertidal marsh, swale, scrub-shrub upland, and dune habitats.

West Grand Terre is part of the Plaquemines barrier island arc, the youngest barrier system of four in Louisiana waters. The island is experiencing in-place-breakup. The current rise in sea level, marsh subsidence, a dwindling sediment supply, wave processes, tropical and extratropical storms, and intense human disturbance are all contributing to the island's shoreline losses. It has the typical topography of a low-relief Louisiana barrier island. Its dunes are few in number and provide little resistance to overwash by frequent storms, therefore shoreline erosion dominates the island's shoreline processes. Within the project boundary there was a total area decrease of 57.92 acres (23.44 ha) between 1956 - 1990 or approximately 1.64 acres yr⁻¹ (0.67ha yr⁻¹).

Two dredge disposal events were completed inside the project boundary by the US Army Corps of Engineers - New Orleans District (USACE-NOD). The first one was completed in 1996 through assistance from the Beneficial Use of Dredged Materials Program (BUMP), where a cell approximately 115 acres in size receive dredge material. In 1999 a second dredge event funded by the USACE-NOD and the Louisiana Department of Natural Resources (LDNR) was completed. The slurry was pumped into an 80 acre (32.4 ha) cell along the northern flank of the 1996 disposal area, excluding the eastern spit. The construction of a rock containment dike on the bay side of the project area was completed during the summer of 1999. Field observations of the spoil from the 1999 dredge operation indicated that the area was largely unvegetated, with undesirable annual species such as *Salicornia bigelovii* Torr. (dwarf saltwort) being the dominant vegetation type. Small amounts of *Spartina alterniflora* Loisel. (smooth cordgrass) were noted in an area with some tidal connection. The erosion of the enclosed dredged material platform could become severe if a substantial wetland base is not developed therefore stabilization of this wetland platform is crucial.

The objective of the Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) project is to vegetate the Army Corps of Engineers sediment disposal areas with perennials indigenous to the barrier island's dune, swale, and intertidal marsh habitats.

Construction of the dredge disposal portions of the Vegetation Plantings of a Dredged Disposal Material Site on Grand Terre Island (BA-28) project was completed in July 2001.



Plantings were installed in May 2001 and three years of vegetation monitoring has been completed. The project has a 20-year economic life which began in July 2001.

The 20 year duration of this project introduces the possibility of future disposal events and vegetative plantings without the exact knowledge of their time frames. Vegetation sampling and analysis of plantings done in conjunction with other projects would make conclusions difficult. Therefore, vegetation sampling has been conducted on the first plantings slated for the spring of 2001, and will not be conducted on any future plantings.

The principal project features include:

- The removal of feral herbivores (approximately 20 goats and 70 cows) from the island from August 15th through September 30, 1999.
- The establishment of vegetation utilizing hand planted nursery grown selected plant species in May 2001. Vegetation included 35,000 vegetative plugs of *Spartina alterniflora* Loisel. (smooth cordgrass) and 600 tube containers of *Avicennia germinans* (L.) L. (black mangrove) planted near the rock containment dike on the Barataria Bay side of the project area; 3,100 four inch containers each of *Spartina patens* (Ait.) Muhl. (marshhay cordgrass), *Panicum amarum* Ell. (bitter panicum), and *Spartina spartinae* (Trin.) Merr. ex A.S. Hitchc. (gulf cordgrass) on the foredune outside of the spoil disposal areas on the Gulf of Mexico side of the project area.



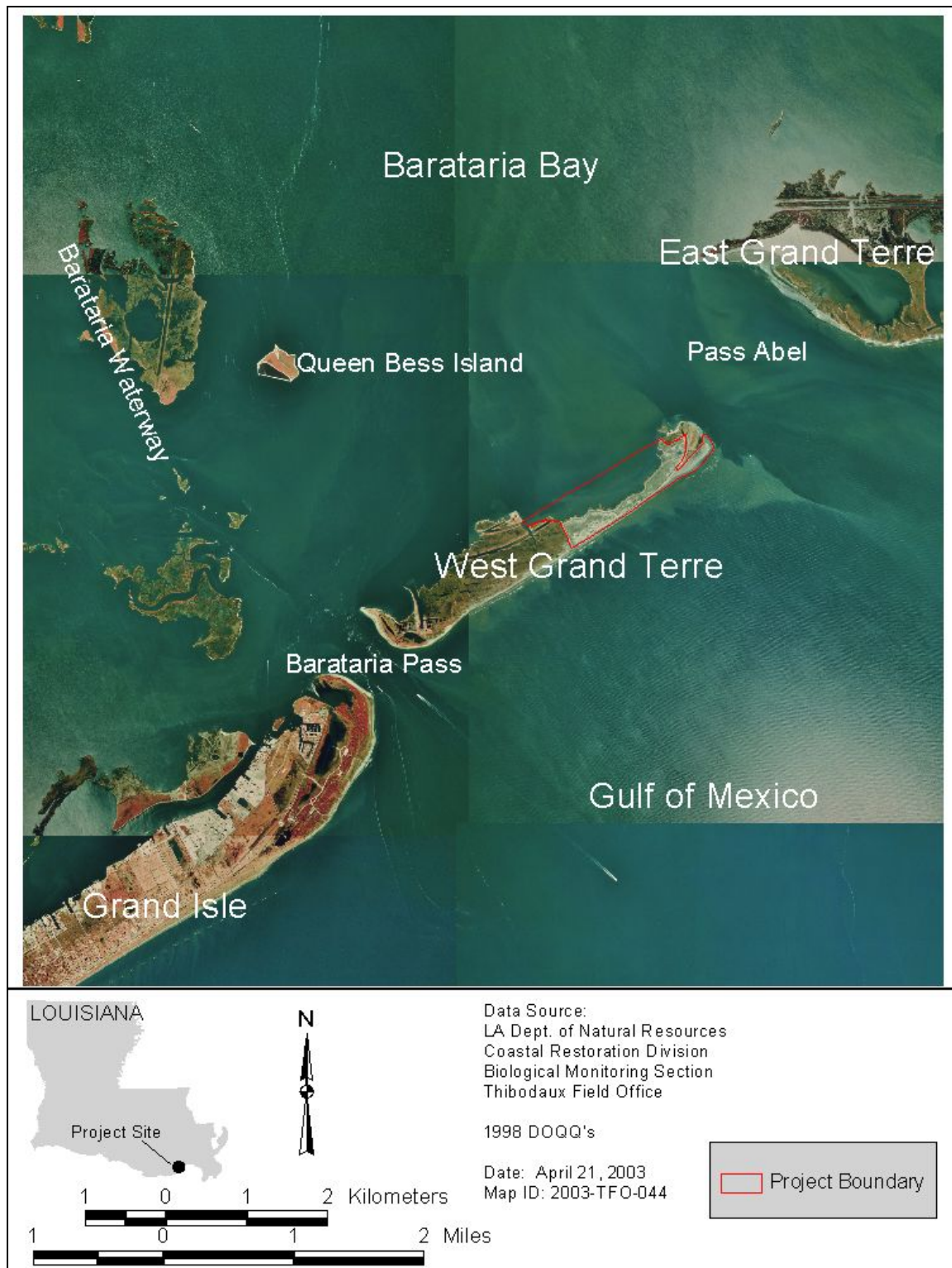


Figure 1. Location map with project boundary for Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) project.



II. Maintenance Activity

a. Project Feature Inspection Procedures

There were no maintenance inspections included in the life of this project.

III. Operation Activity

a. Operation Plan

There was no operations plan for the life of this project.

IV. Monitoring Activity

a. Monitoring Goals

The objective of the Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) project is to vegetate the Army Corps of Engineers sediment disposal areas with perennials indigenous to the barrier island's dune, swale, and intertidal marsh habitats.

The following goal will contribute to the evaluation of the above objective:

1. Increase vegetation cover of these selected species; *S. alterniflora*, *A. germinans*, *S. patens*, *S. spartinae*, and *P. amarum* through installation of vegetation plantings.

b. Monitoring Elements

Habitat Mapping

To determine vegetation cover and land loss rates, Beneficial Use of Dredged Material Program (BUMP) data reports will be utilized.

Vegetation

To determine species composition, % cover, and % survival of planted species, vegetation was monitored in approximately 140 randomly placed plots. Each plot had an adjacent unplanted control plot therefore, 70 plots were planted and 70 plots were unplanted. A 4 m² grid was centered inside of each randomized plot to collect % cover and species composition data using the Braun-Blanquet method. Survival data for planted species was collected inside the larger plot for each planted plot. Plots were originally established for three different treatments; dune plots, bay disposal plots, and interior disposal plots. Vegetation data were collected (pre-construction) in April 2001, and post-construction in fall 2001, fall 2002 and fall 2003.



IV. Monitoring Activity (continued)
c. Monitoring Data

Habitat Mapping

There are no BUMP habitat mapping data available at this time.

Vegetation

Figures:

Figure 2. Vegetation plot locations in the three treatment areas; dune, bay and interior treatments areas for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

Figures 3 - 5. Location map for dune area vegetation plots for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

Figure 6. Location map for vegetation plots in the Bay disposal area for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

Figure 7. Location map for vegetation plots in the Interior disposal area for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

Figure 8. Mean percent cover of selected species for all Braun-Blanquet vegetation plots throughout the duration of monitoring for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

Tables:

Tables 1 - 6. Mean percent cover of all species in the Braun-Blanquet vegetation plots for (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.

Table 7. Percent survival of planted species inside the planted dune and bay plots for (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.



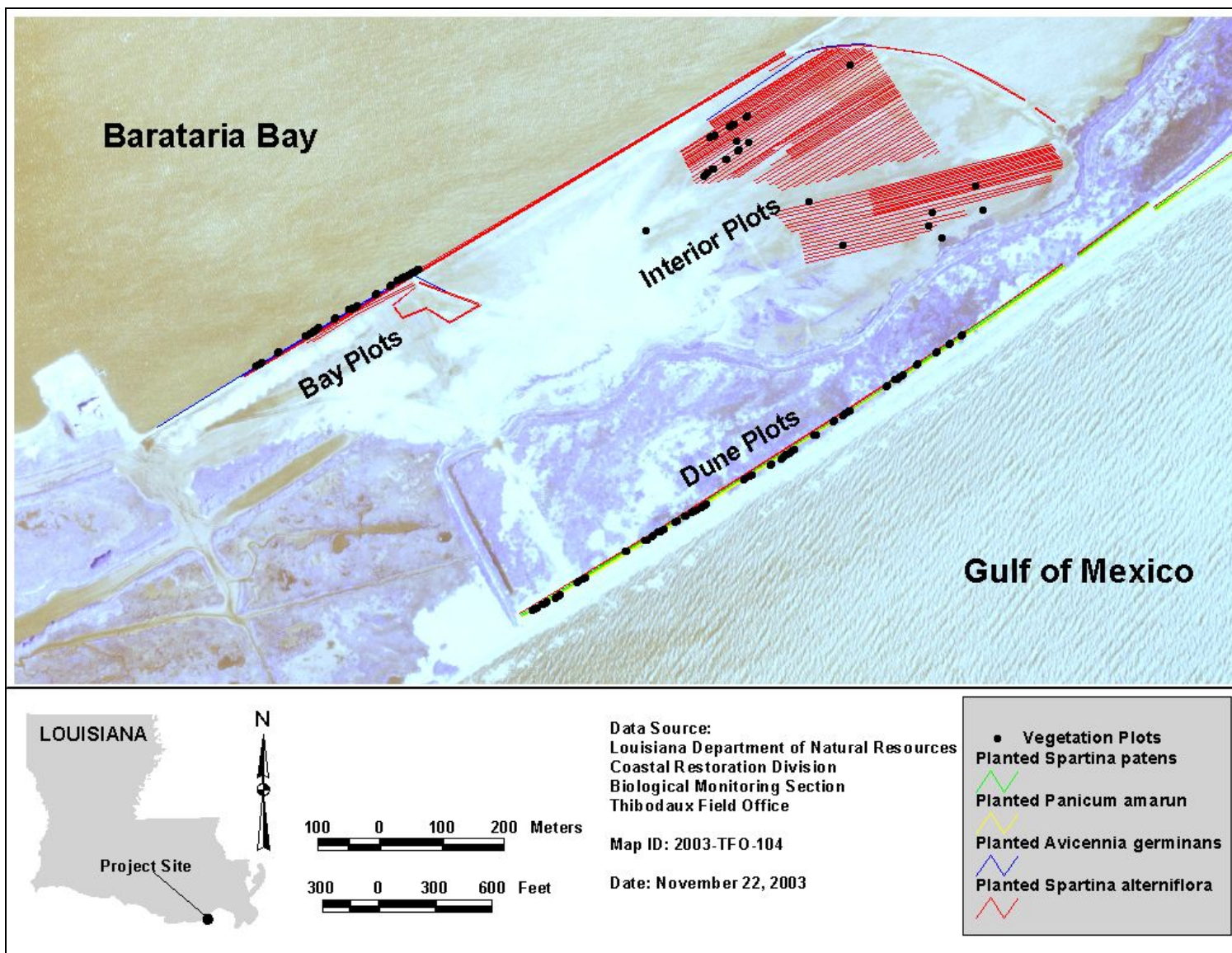


Figure 2. Vegetation plot locations for the three treatment areas monitored for the (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.

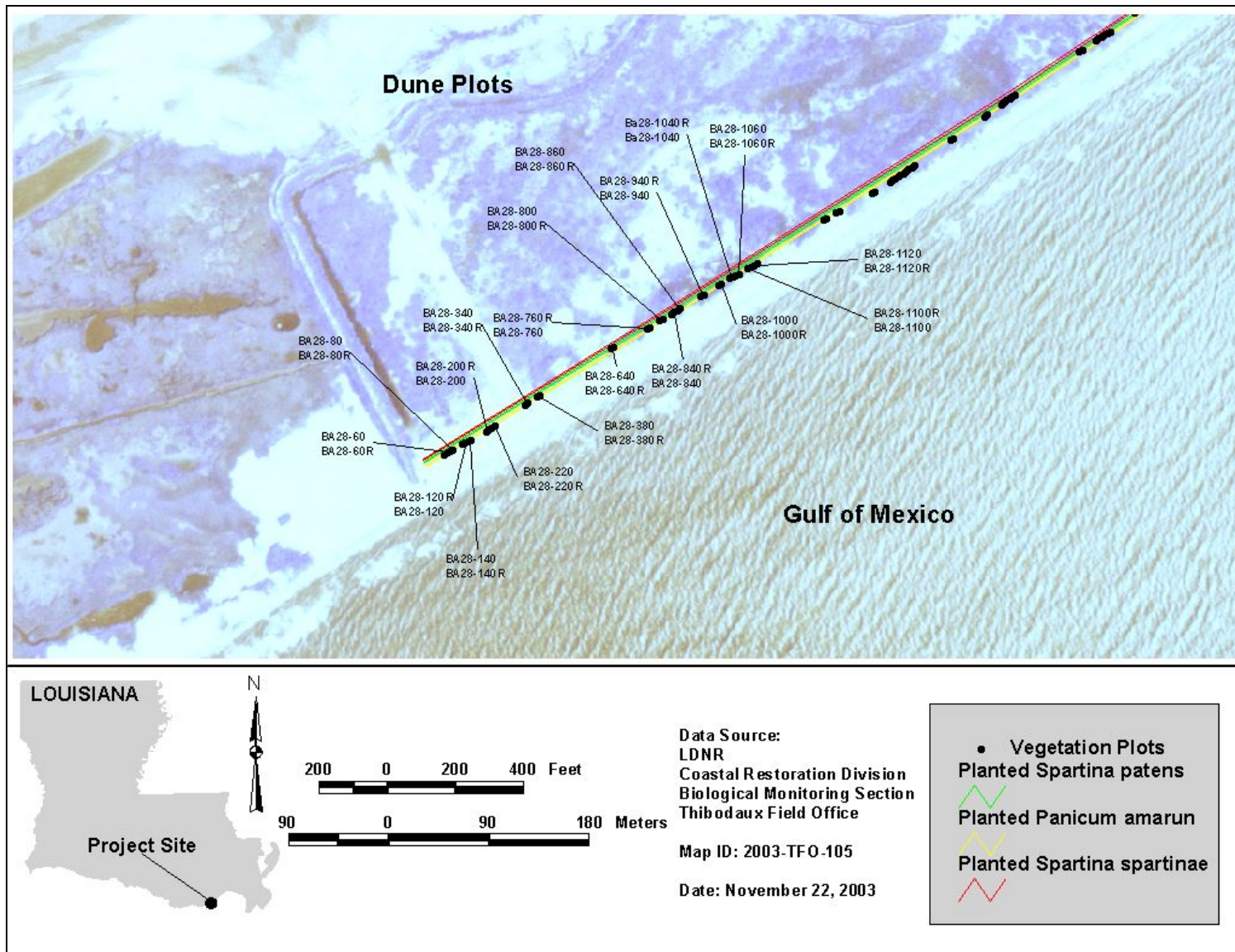


Figure 3. Dune vegetation plot locations for the (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.



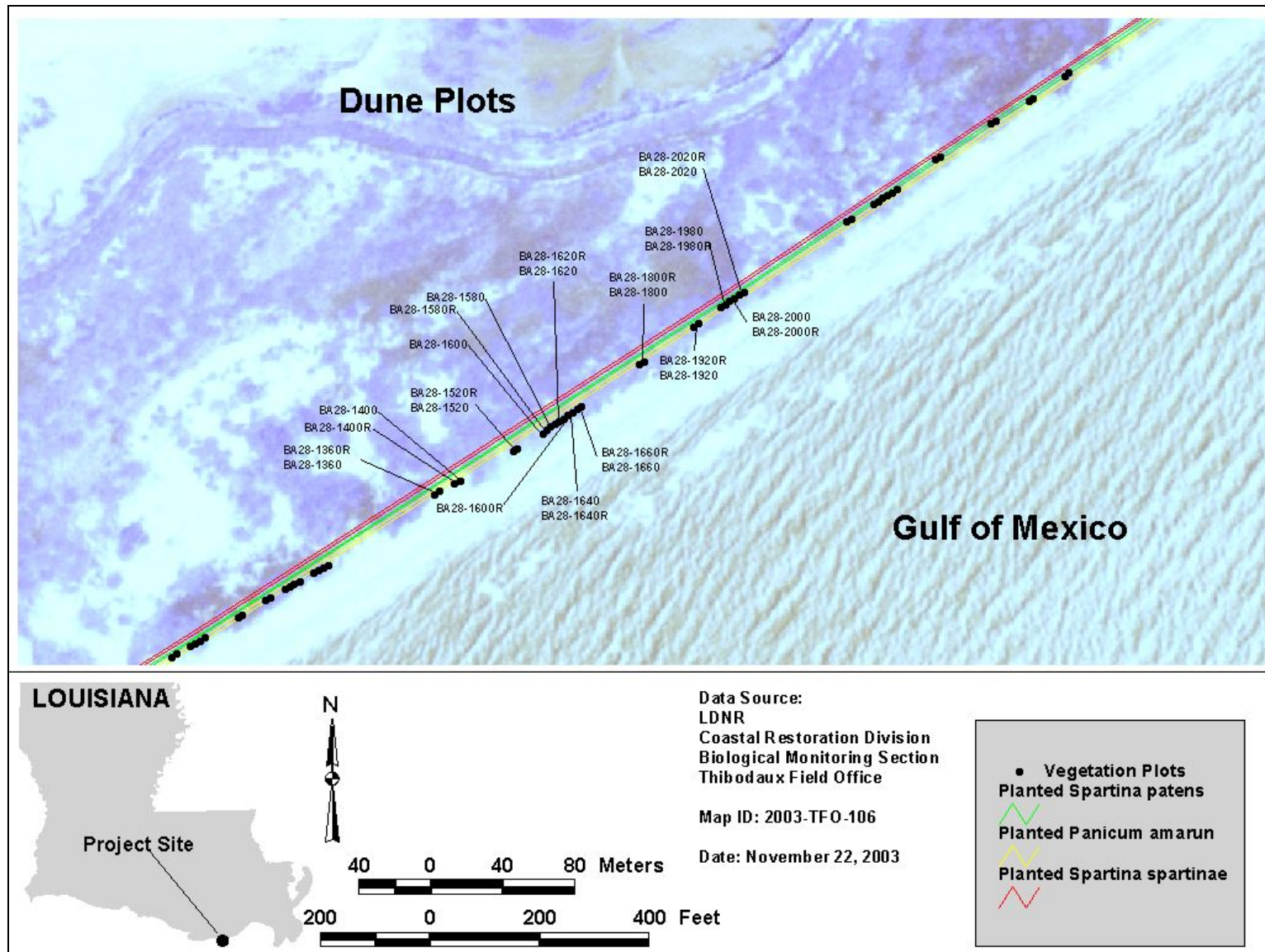


Figure 4. Dune vegetation plot locations for the (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.



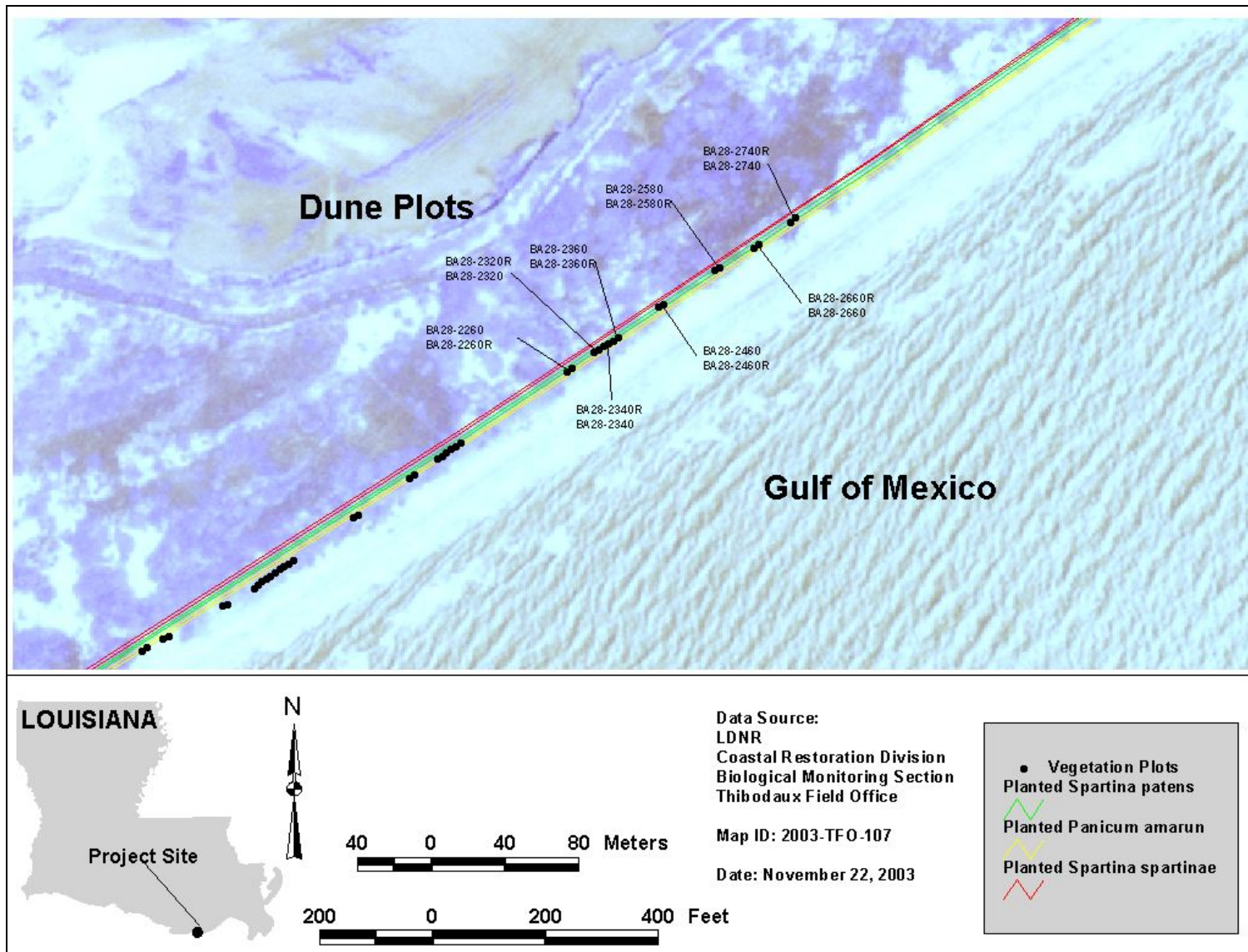


Figure 5. Dune vegetation plot locations for the (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.



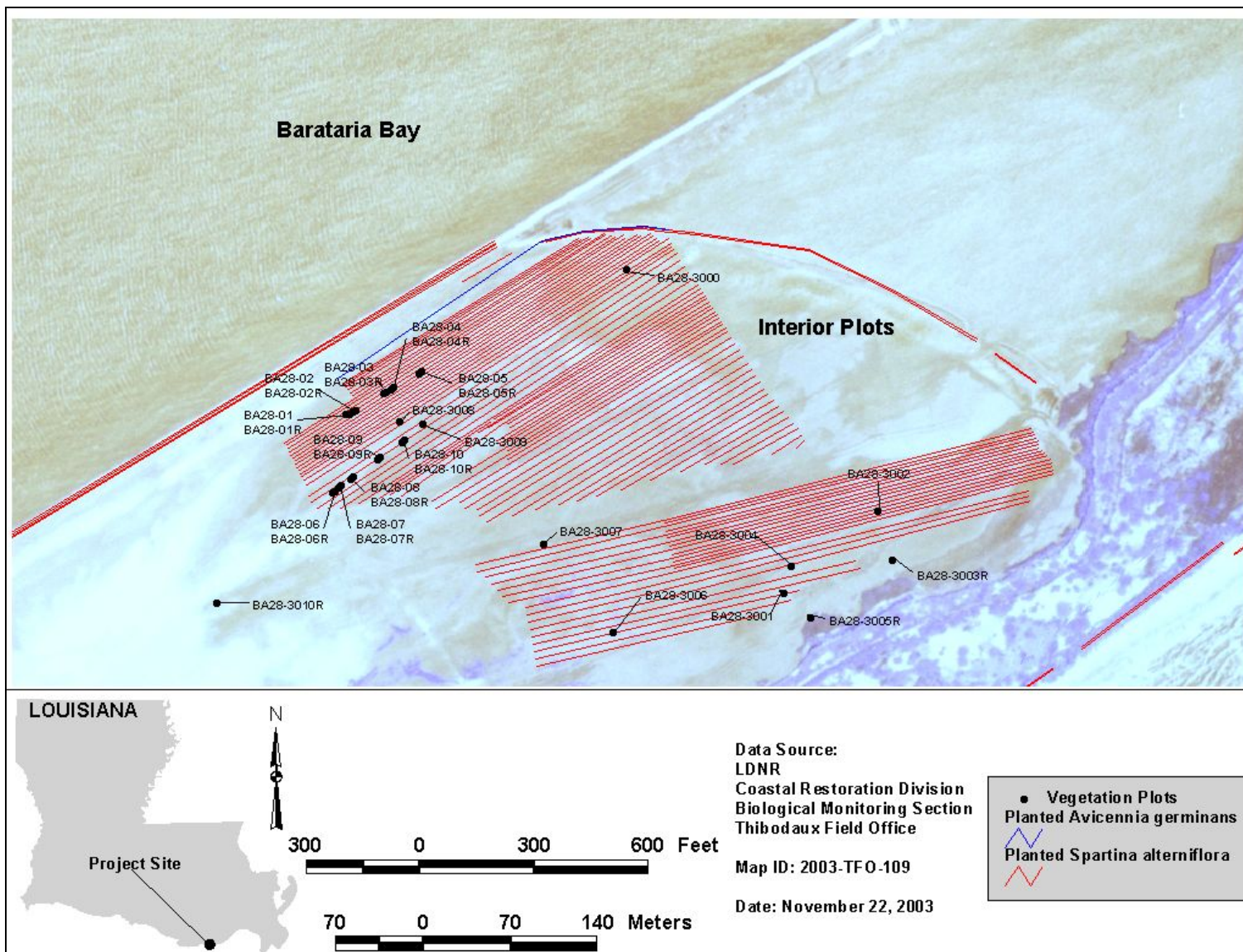


Figure 7. Interior disposal area vegetation plot locations for the (BA-28) Vegetative Plantings of a Dredged Disposal Material Site on Grand Terre Island project.



Table 1. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Dune Project							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
<i>Alternanthera paronichyoides</i> St.-Hil.			22.22	9.63	8.57		7.14	0.50
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	17.14	19.42						
<i>Amaranthus</i> L.	5.71	0.30						
<i>Amaranthus cannabinus</i> (L.) Sauer	2.86	0.10				5.00		
<i>Amaranthus greggii</i> S. Wats.					2.86	0.10		
<i>Atriplex cristata</i> Humb. & Bonpl. ex Willd.					2.86			
<i>Atriplex pentandra</i> (Jacq.) Standl.	2.86	5.00				0.10		
<i>Avicennia germinans</i> (L.) L.	2.86	0.10	2.78	0.10	2.86	26.67	7.14	0.10
<i>Baccharis halimifolia</i> L.	2.86	0.10	2.78	3.00	8.57	28.70	7.14	0.10
Bare Ground	77.14	17.46	100.00	29.47	65.71	12.75	64.29	32.44
<i>Batis maritima</i> L.	48.57	34.56	36.11	18.19	28.57		50.00	18.93
<i>Bidens bipinnata</i> L.	2.86	0.10				42.25		
<i>Borrchia frutescens</i> (L.) DC.	17.14	39.25	11.11	65.00	22.86		21.43	56.67
<i>Cakile geniculata</i> (B.L. Robins.) Millsp.								
<i>Centella erecta</i> (L. f.) Fern.								
<i>Chenopodium album</i> L. var. <i>album</i>	14.29	0.10						
<i>Cirsium horridulum</i> Michx.						5.00		
<i>Cissus trifoliata</i> (L.) L.					2.86	7.04		
<i>Conyza canadensis</i> (L.) Cronq.					22.86			
<i>Croton punctatus</i> Jacq.			2.78	5.00				
<i>Cuscuta</i> L.			2.78	0.50		3.00		
<i>Cynodon dactylon</i> (L.) Pers.					2.86	19.75		
<i>Distichlis spicata</i> (L.) Greene	82.86	56.26	11.11	40.00	22.86		28.57	25.00
<i>Eragrostis secundiflora</i> J. Presl			5.56	0.30				
<i>Fimbristylis castanea</i> (Michx.) Vahl			2.78	0.50				
<i>Galium</i> L.			2.78	5.00				
<i>Gamochaeta purpurea</i> (L.) Cabrera	11.43	0.43						
<i>Heliotropium curassavicum</i> L.	14.29	4.04	8.33	8.33		15.00		
<i>Hydrocotyle bonariensis</i> Comm. ex Lam.					11.43	13.33		
<i>Ipomoea</i> L.					8.57			
<i>Ipomoea imperati</i> (Vahl) Griseb.								
<i>Ipomoea sagittata</i> Poir.			2.78	0.10		28.59		
<i>Iva frutescens</i> L.	8.57	1.73	22.22	12.03	34.29		14.29	2.55
<i>Lepidium virginicum</i> L.								



Table 1 (continued). Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Dune Project							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Limonium carolinianum (Walt.) Britt.								
Oenothera humifusa Nutt.	2.86	0.10				26.62		
Panicum amarum Ell.			25.00	6.79	71.43		64.29	30.72
Paspalum distichum L.			8.33	31.83				
Paspalum vaginatum Sw.						62.50	14.29	2.75
Phyla nodiflora (L.) Greene	8.57	61.67	11.11	49.00	11.43			
Pilea microphylla (L.) Liebm.	2.86	0.50						
Plantago virginica L.	5.71	5.25						
Rumex pulcher L.	51.43	7.58						
Salicornia bigelovii Torr.	34.29	21.34						
Sesuvium portulacastrum (L.) L.	5.71	10.25	11.11	20.13		6.70	14.29	10.25
Solanum ptychanthum Dunal					8.57	8.92		
Solidago sempervirens L.	25.71	0.32	8.33	12.67	25.71		50.00	23.59
Sonchus asper (L.) Hill	17.14	0.38						
Spartina alterniflora Loisel.	2.86	5.00				16.78		
Spartina patens (Ait.) Muhl.	5.71	23.50	13.89	2.30	25.71		42.86	39.25
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.			2.78	5.00				
Spergularia salina J. & K. Presl	11.43	12.53				39.62		
Sporobolus virginicus (L.) Kunth			77.78	45.41	37.14		35.71	23.00
Strophostyles helvula (L.) Ell.							7.14	10.00
Suaeda linearis (Ell.) Moq.						8.40		
Symphyotrichum subulatum (Michx.) Nesom			2.78	5.00	8.57			
Symphyotrichum tenuifolium (L.) Nesom								
Teucrium canadense L.								
Unknown	5.71	0.10						
Unknown #4	2.86	0.10						
Unknown #5	17.14	0.23				2.00		
Vigna luteola (Jacq.) Benth.	2.86	0.50			2.86		28.57	10.00
Zanthoxylum clava-herculis L.								



Table 2. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Dune Reference							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
<i>Alternanthera paronichyoides</i> St.-Hil.			27.50	44.14	17.14		7.14	5.00
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	25.00	61.51						
<i>Amaranthus</i> L.								
<i>Amaranthus cannabinus</i> (L.) Sauer								
<i>Amaranthus greggii</i> S. Wats.						3.52		
<i>Atriplex cristata</i> Humb. & Bonpl. ex Willd.					17.14			
<i>Atriplex pentandra</i> (Jacq.) Standl.	12.50	2.16						
<i>Avicennia germinans</i> (L.) L.	2.50	0.10	2.50	0.10		20.00	14.29	5.25
<i>Baccharis halimifolia</i> L.					5.71	27.60		
Bare Ground	82.50	18.97	95.00	26.71	71.43	12.77	64.29	35.56
<i>Batis maritima</i> L.	47.50	20.70	40.00	23.29	37.14		50.00	25.14
<i>Bidens bipinnata</i> L.						25.00		
<i>Borrchia frutescens</i> (L.) DC.	7.50	18.33	10.00	32.63	20.00		28.57	40.00
<i>Cakile geniculata</i> (B.L. Robins.) Millsp.	2.50	0.10						
<i>Centella erecta</i> (L. f.) Fern.	2.50	0.10						
<i>Chenopodium album</i> L. var. <i>album</i>								
<i>Cirsium horridulum</i> Michx.	5.00	2.55				80.00		
<i>Cissus trifoliata</i> (L.) L.					2.86	18.75	7.14	5.00
<i>Conyza canadensis</i> (L.) Cronq.					11.43			
<i>Croton punctatus</i> Jacq.	2.50	0.10						
<i>Cuscuta</i> L.								
<i>Cynodon dactylon</i> (L.) Pers.						20.50		
<i>Distichlis spicata</i> (L.) Greene	85.00	52.25	7.50	13.50	31.43		42.86	17.58
<i>Eragrostis secundiflora</i> J. Presl								
<i>Fimbristylis castanea</i> (Michx.) Vahl			2.50	0.50				
<i>Galium</i> L.								
<i>Gamochaeta purpurea</i> (L.) Cabrera	2.50	0.10				5.00		
<i>Heliotropium curassavicum</i> L.	15.00	3.68	15.00	5.17	2.86	6.83		
<i>Hydrocotyle bonariensis</i> Comm. ex Lam.	2.50	5.00	2.50	20.00	8.57	3.88		
<i>Ipomoea</i> L.					11.43			
<i>Ipomoea imperati</i> (Vahl) Griseb.	2.50	0.10						
<i>Ipomoea sagittata</i> Poir.						32.89		
<i>Iva frutescens</i> L.	20.00	2.26	27.50	13.25	40.00			
<i>Lepidium virginicum</i> L.	2.50	0.10						



Table 2. (continued).

Species	Dune Reference							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Limonium carolinianum (Walt.) Britt.	2.50	0.10						
Oenothera humifusa Nutt.						13.20		
Panicum amarum Ell.			2.50	0.10	51.43		64.29	50.61
Paspalum distichum L.			22.50	12.39				
Paspalum vaginatum Sw.						27.86	28.57	16.38
Phyla nodiflora (L.) Greene	2.50	100.00	17.50	30.93	20.00			
Pilea microphylla (L.) Liebm.								
Plantago virginica L.								
Rumex pulcher L.	57.50	6.03						
Salicornia bigelovii Torr.	37.50	18.20				5.00		
Sesuvium portulacastrum (L.) L.	5.00	0.30	5.00	2.75	2.86	10.00	14.29	10.00
Solanum ptychanthum Dunal					8.57	16.03		
Solidago sempervirens L.	27.50	1.18	10.00	11.30	28.57		35.71	26.20
Sonchus asper (L.) Hill	17.50	0.93	2.50	0.50				
Spartina alterniflora Loisel.			2.50	0.50		20.09		
Spartina patens (Ait.) Muhl.	12.50	1.50	17.50	12.43	31.43		50.00	8.64
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.								
Spergularia salina J. & K. Presl	12.50	2.24				42.06		
Sporobolus virginicus (L.) Kunth			72.50	49.57	45.71		28.57	6.38
Strophostyles helvula (L.) Ell.							7.14	10.00
Suaeda linearis (Ell.) Moq.			2.50	0.10		3.06		
Symphyotrichum subulatum (Michx.) Nesom			2.50	0.50	14.29			
Symphyotrichum tenuifolium (L.) Nesom							14.29	0.30
Teucrium canadense L.	2.50	0.10						
Unknown	15.00	0.57						
Unknown #4	5.00	0.10						
Unknown #5	7.50	0.37				6.83		
Vigna luteola (Jacq.) Benth.	10.00	0.20			8.57	0.10	35.71	5.80
Zanthoxylum clava-herculis L.					2.86			



Table 3. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blaunqet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Bay							
	Project							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Alternanthera paronichyoides St.-Hil.								
Alternanthera philoxeroides (Mart.) Griseb.								
Amaranthus L.								
Amaranthus cannabinus (L.) Sauer								
Amaranthus greggii S. Wats.								
Atriplex cristata Humb. & Bonpl. ex Willd.								
Atriplex pentandra (Jacq.) Standl.								
Avicennia germinans (L.) L.			21.05	0.75	43.75	1.07	50.00	4.49
Baccharis halimifolia L.								
Bare Ground	100.00	99.62	100.00	89.74	62.50	16.50	85.71	17.50
Batis maritima L.								
Bidens bipinnata L.								
Borrchia frutescens (L.) DC.								
Cakile geniculata (B.L. Robins.) Millsp.								
Centella erecta (L. f.) Fern.								
Chenopodium album L. var. album								
Cirsium horridulum Michx.								
Cissus trifoliata (L.) L.								
Conyza canadensis (L.) Cronq.								
Croton punctatus Jacq.								
Cuscuta L.								
Cynodon dactylon (L.) Pers.								
Distichlis spicata (L.) Greene								
Eragrostis secundiflora J. Presl								
Fimbristylis castanea (Michx.) Vahl								
Galium L.								
Gamochaeta purpurea (L.) Cabrera								
Heliotropium curassavicum L.								
Hydrocotyle bonariensis Comm. ex Lam.								
Ipomoea L.								
Ipomoea imperati (Vahl) Griseb.								
Ipomoea sagittata Poir.								
Iva frutescens L.								
Lepidium virginicum L.								



Table 3. (Continued).

Species	Bay							
	Project							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Limonium carolinianum (Walt.) Britt.								
Oenothera humifusa Nutt.								
Panicum amarum Ell.								
Paspalum distichum L.								
Paspalum vaginatum Sw.								
Phyla nodiflora (L.) Greene								
Pilea microphylla (L.) Liebm.								
Plantago virginica L.								
Rumex pulcher L.								
Salicornia bigelovii Torr.	19.05	0.88						
Sesuvium portulacastrum (L.) L.								
Solanum ptychanthum Dunal								
Solidago sempervirens L.								
Sonchus asper (L.) Hill								
Spartina alterniflora Loisel.	19.05	0.88	84.21	13.72	100.00	88.75	100.00	84.57
Spartina patens (Ait.) Muhl.								
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.								
Spergularia salina J. & K. Presl								
Sporobolus virginicus (L.) Kunth								
Strophostyles helvula (L.) Ell.								
Suaeda linearis (Ell.) Moq.								
Symphyotrichum subulatum (Michx.) Nesom								
Symphyotrichum tenuifolium (L.) Nesom								
Teucrium canadense L.								
Unknown								
Unknown #4								
Unknown #5								
Vigna luteola (Jacq.) Benth.								
Zanthoxylum clava-herculis L.								



Table 4. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Dune							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Alternanthera paronichyoides St.-Hil.			27.50	44.14	17.14		7.14	5.00
Alternanthera philoxeroides (Mart.) Griseb.	25.00	61.51						
Amaranthus L.								
Amaranthus cannabinus (L.) Sauer								
Amaranthus greggii S. Wats.						3.52		
Atriplex cristata Humb. & Bonpl. ex Willd.					17.14			
Atriplex pentandra (Jacq.) Standl.	12.50	2.16						
Avicennia germinans (L.) L.	2.50	0.10	2.50	0.10		20.00	14.29	5.25
Baccharis halimifolia L.					5.71	27.60		
Bare Ground	82.50	18.97	95.00	26.71	71.43	12.77	64.29	35.56
Batis maritima L.	47.50	20.70	40.00	23.29	37.14		50.00	25.14
Bidens bipinnata L.						25.00		
Borrchia frutescens (L.) DC.	7.50	18.33	10.00	32.63	20.00		28.57	40.00
Cakile geniculata (B.L. Robins.) Millsp.	2.50	0.10						
Centella erecta (L. f.) Fern.	2.50	0.10						
Chenopodium album L. var. album								
Cirsium horridulum Michx.	5.00	2.55				80.00		
Cissus trifoliata (L.) L.					2.86	18.75	7.14	5.00
Conyza canadensis (L.) Cronq.					11.43			
Croton punctatus Jacq.	2.50	0.10						
Cuscuta L.								
Cynodon dactylon (L.) Pers.						20.50		
Distichlis spicata (L.) Greene	85.00	52.25	7.50	13.50	31.43		42.86	17.58
Eragrostis secundiflora J. Presl								
Fimbristylis castanea (Michx.) Vahl			2.50	0.50				
Galium L.								
Gamochaeta purpurea (L.) Cabrera	2.50	0.10				5.00		
Heliotropium curassavicum L.	15.00	3.68	15.00	5.17	2.86	6.83		
Hydrocotyle bonariensis Comm. ex Lam.	2.50	5.00	2.50	20.00	8.57	3.88		
Ipomoea L.					11.43			
Ipomoea imperati (Vahl) Griseb.	2.50	0.10						
Ipomoea sagittata Poir.						32.89		
Iva frutescens L.	20.00	2.26	27.50	13.25	40.00			
Lepidium virginicum L.	2.50	0.10						



Table 4 (continued).

Species	Dune Reference							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Limonium carolinianum (Walt.) Britt.	2.50	0.10				13.20		
Oenothera humifusa Nutt.								
Panicum amarum Ell.			2.50	0.10	51.43		64.29	50.61
Paspalum distichum L.			22.50	12.39				
Paspalum vaginatum Sw.						27.86	28.57	16.38
Phyla nodiflora (L.) Greene	2.50	100.00	17.50	30.93	20.00			
Pilea microphylla (L.) Liebm.								
Plantago virginica L.								
Rumex pulcher L.	57.50	6.03						
Salicornia bigelovii Torr.	37.50	18.20				5.00		
Sesuvium portulacastrum (L.) L.	5.00	0.30	5.00	2.75	2.86	10.00	14.29	10.00
Solanum ptychanthum Dunal					8.57	16.03		
Solidago sempervirens L.	27.50	1.18	10.00	11.30	28.57		35.71	26.20
Sonchus asper (L.) Hill	17.50	0.93	2.50	0.50				
Spartina alterniflora Loisel.			2.50	0.50		20.09		
Spartina patens (Ait.) Muhl.	12.50	1.50	17.50	12.43	31.43		50.00	8.64
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.								
Spergularia salina J.& K. Presl	12.50	2.24				42.06		
Sporobolus virginicus (L.) Kunth			72.50	49.57	45.71		28.57	6.38
Strophostyles helvula (L.) Ell.							7.14	10.00
Suaeda linearis (Ell.) Moq.			2.50	0.10		3.06		
Symphyotrichum subulatum (Michx.) Nesom			2.50	0.50	14.29			
Symphyotrichum tenuifolium (L.) Nesom							14.29	0.30
Teucrium canadense L.	2.50	0.10						
Unknown	15.00	0.57						
Unknown #4	5.00	0.10						
Unknown #5	7.50	0.37				6.83		
Vigna luteola (Jacq.) Benth.	10.00	0.20			8.57	0.10	35.71	5.80
Zanthoxylum clava-herculis L.					2.86			



Table 5. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Alternanthera paronichyoides St.-Hil.								
Alternanthera philoxeroides (Mart.) Griseb.								
Amaranthus L.								
Amaranthus cannabinus (L.) Sauer								
Amaranthus greggii S. Wats.								
Atriplex cristata Humb. & Bonpl. ex Willd.								
Atriplex pentandra (Jacq.) Standl.								
Avicennia germinans (L.) L.								
Baccharis halimifolia L.								
Bare Ground	100.00	100.00					100.00	27.13
Batis maritima L.								
Bidens bipinnata L.								
Borrchia frutescens (L.) DC.								
Cakile geniculata (B.L. Robins.) Millsp.								
Centella erecta (L. f.) Fern.								
Chenopodium album L. var. album								
Cirsium horridulum Michx.								
Cissus trifoliata (L.) L.								
Conyza canadensis (L.) Cronq.								
Croton punctatus Jacq.								
Cuscuta L.								
Cynodon dactylon (L.) Pers.								
Distichlis spicata (L.) Greene								
Eragrostis secundiflora J. Presl								
Fimbristylis castanea (Michx.) Vahl								
Galium L.								
Gamochaeta purpurea (L.) Cabrera								
Heliotropium curassavicum L.								
Hydrocotyle bonariensis Comm. ex Lam.								
Ipomoea L.								
Ipomoea imperati (Vahl) Griseb.								
Ipomoea sagittata Poir.								
Iva frutescens L.								
Lepidium virginicum L.								
Limonium carolinianum (Walt.) Britt.								



Table 5. (Continued).

Species	Interior Project							
	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Oenothera humifusa Nutt.								
Panicum amarum Ell.								
Paspalum distichum L.								
Paspalum vaginatum Sw.								
Phyla nodiflora (L.) Greene								
Pilea microphylla (L.) Liebm.								
Plantago virginica L.								
Rumex pulcher L.								
Salicornia bigelovii Torr.								
Sesuvium portulacastrum (L.) L.								
Solanum ptychanthum Dunal								
Solidago sempervirens L.								
Sonchus asper (L.) Hill								
Spartina alterniflora Loisel.							100.00	72.50
Spartina patens (Ait.) Muhl.								
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.								
Spergularia salina J.& K. Presl								
Sporobolus virginicus (L.) Kunth								
Strophostyles helvula (L.) Ell.								
Suaeda linearis (Ell.) Moq.								
Symphyotrichum subulatum (Michx.) Nesom								
Symphyotrichum tenuifolium (L.) Nesom								
Teucrium canadense L.								
Unknown								
Unknown #4								
Unknown #5								
Vigna luteola (Jacq.) Benth.								
Zanthoxylum clava-herculis L.								



Table 6. Estimated mean percent cover for all species occurring during 2001, 2002, and 2003 sampling of 2x2 m Braun-Blanquet vegetation plots at Vegetation Plantings on Dredged Disposal Material Site on Grand Terre Island (BA-28) project.

Species	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Alternanthera paronichyoides St.-Hil.								
Alternanthera philoxeroides (Mart.) Griseb.								
Amaranthus L.								
Amaranthus cannabinus (L.) Sauer								
Amaranthus greggii S. Wats.								
Atriplex cristata Humb. & Bonpl. ex Willd.								
Atriplex pentandra (Jacq.) Standl.								
Avicennia germinans (L.) L.								
Baccharis halimifolia L.								
Bare Ground	100.00	100.00					100.00	10.00
Batis maritima L.								
Bidens bipinnata L.								
Borrchia frutescens (L.) DC.								
Cakile geniculata (B.L. Robins.) Millsp.								
Centella erecta (L. f.) Fern.								
Chenopodium album L. var. album								
Cirsium horridulum Michx.								
Cissus trifoliata (L.) L.								
Conyza canadensis (L.) Cronq.								
Croton punctatus Jacq.								
Cuscuta L.								
Cynodon dactylon (L.) Pers.								
Distichlis spicata (L.) Greene								
Eragrostis secundiflora J. Presl								
Fimbristylis castanea (Michx.) Vahl								
Galium L.								
Gamochaeta purpurea (L.) Cabrera								
Heliotropium curassavicum L.								
Hydrocotyle bonariensis Comm. ex Lam.								
Ipomoea L.								
Ipomoea imperati (Vahl) Griseb.								
Ipomoea sagittata Poir.								
Iva frutescens L.								
Lepidium virginicum L.								
Limonium carolinianum (Walt.) Britt.								



Table 6. (Continued).

Species	Spring 2001		Fall 2001		Fall 2002		Fall 2003	
	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover	% Stations	Mean Cover
Oenothera humifusa Nutt.								
Panicum amarum Ell.								
Paspalum distichum L.								
Paspalum vaginatum Sw.								
Phyla nodiflora (L.) Greene								
Pilea microphylla (L.) Liebm.								
Plantago virginica L.								
Rumex pulcher L.								
Salicornia bigelovii Torr.								
Sesuvium portulacastrum (L.) L.								
Solanum ptychanthum Dunal								
Solidago sempervirens L.								
Sonchus asper (L.) Hill								
Spartina alterniflora Loisel.							100.00	90.00
Spartina patens (Ait.) Muhl.								
Spartina spartinae (Trin.) Merr. ex A.S. Hitchc.								
Spergularia salina J.& K. Presl								
Sporobolus virginicus (L.) Kunth								
Strophostyles helvula (L.) Ell.								
Suaeda linearis (Ell.) Moq.								
Symphyotrichum subulatum (Michx.) Nesom								
Symphyotrichum tenuifolium (L.) Nesom								
Teucrium canadense L.								
Unknown								
Unknown #4								
Unknown #5								
Vigna luteola (Jacq.) Benth.								
Zanthoxylum clava-herculis L.								



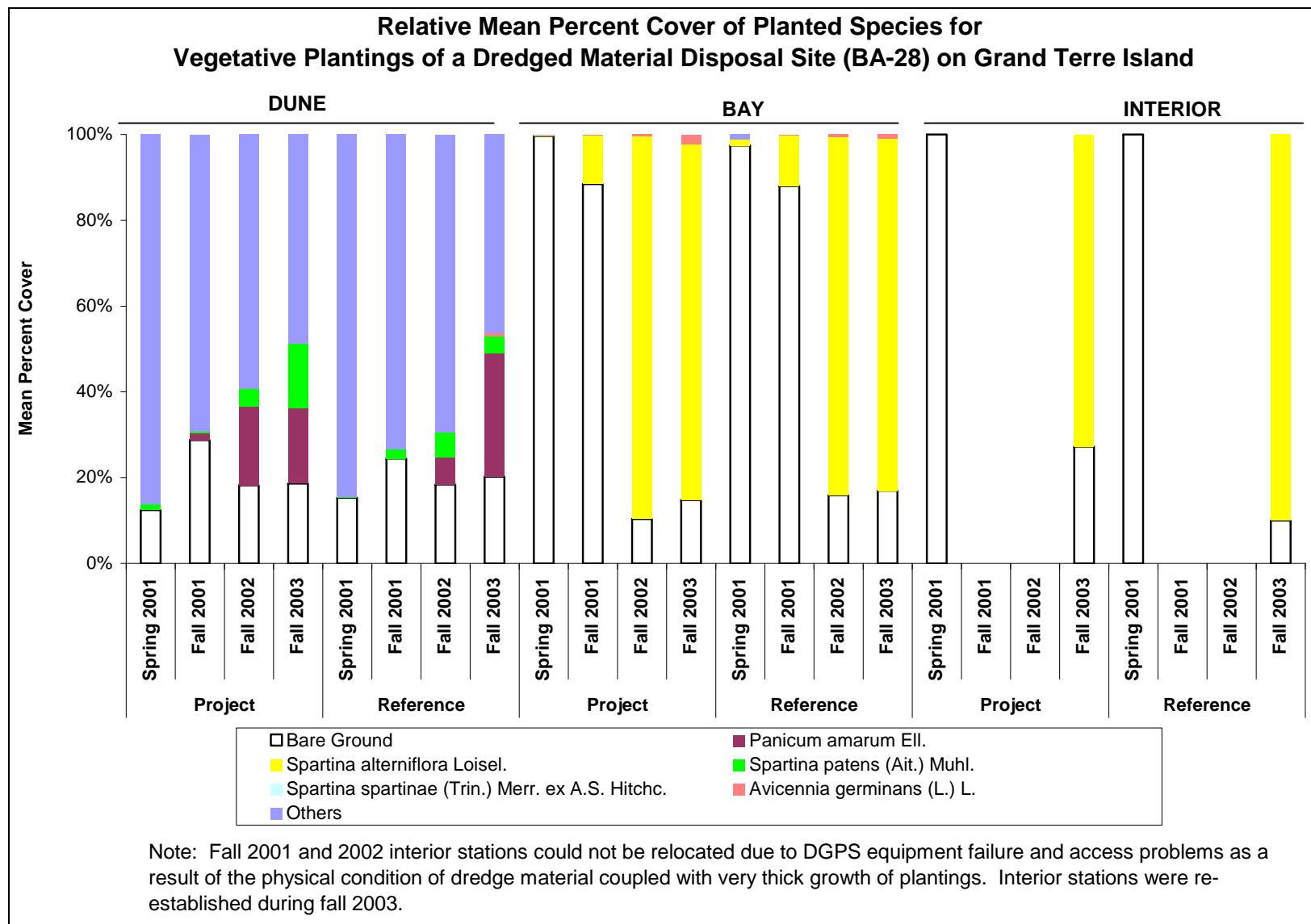


Figure 8. Mean percent cover of planted species by project and reference plot and year for the Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island (BA-28) project.



Table 7. Fall 2001 percent survival data for the planted dune and bay plots for the (BA-28) Vegetative Plantings of a Dredged Material Disposal Site on Grand Terre Island project.

DUNE (40 plots)				BAY (16 plots)			
Species	Planted	Alive	Percent Survival Fall 2001	Species	Planted	Alive	Percent Survival Fall 2001
<i>Panicum amarum</i>	200	103	51.5	<i>Spartina alterniflora</i>	320	189	59
<i>Spartina patens</i>	200	15	7.5				
<i>Spartina spartinae</i>	200	23	11.5				



IV. Monitoring Activity (continued)

d. Preliminary Monitoring Results and Discussion

Habitat Mapping

No BUMP data were available for preliminary analysis, therefore no results are available.

Vegetation

Results from data collected inside the eighty Braun-Blanquet plots for the dune plantings indicate that two of the three planted species, *P. amarum* and *S. patens* increased in relative mean percent cover. Although *S. spartinae* was present inside the larger planted plots where percent survival data was collected, it did not expand or increase its cover enough to fall inside the perimeters of the smaller, overlapping Braun-Blanquet plots. This explains why *S. spartinae* was not present inside the Braun-Blanquet plots two and three growing seasons post-planting (figure 8).

Percent survival data collected inside the forty planted plots along the dune indicate that *P. amarum* had 51.5 percent survival, *S. spartinae* had 11.5 percent survival, and *S. patens* had 7.5 percent survival one growing season post-planting in fall 2001 (table 7). Results from the 2002 and 2003 percent survival data collection, two and three years post-planting, were inconclusive. Live/dead counts were difficult to ascertain where plants formed tillers and were indistinguishable from the parent plants, and where some may have been the seeded offspring of other plants since they did not follow the previously known planting scheme.

For the *S. alterniflora* plantings, relative mean percent cover of this species increased substantially inside the bay and interior disposal area plots for both project and reference Braun-Blanquet plots (figure 8). Though the interior plots had to be re-established, the area can be characterized as experiencing a substantial increase in relative mean percent cover of the planted *S. alterniflora* when compared to the pre-planting relative mean percent cover. Of the 40 bay plots established in 2001, 30 plots remained in 2003, three years post-planting. For the interior disposal area plots, the 20 plots initially established were never located again, so 10 new plots were established in 2003, three years post-planting.

Percent survival data for the *S. alterniflora* plantings collected inside the sixteen planted bay plots on the disposal area indicated 59 percent survival one growing season post-planting in fall 2001 (table 7). Results from the 2002 and 2003 percent survival data collection, two and three years post-planting, were inconclusive. The plantings filled in the area substantially, making it impossible to discern between the original parent plants and the tillers. Field observations indicate the *S. alterniflora* plantings were successful throughout the planted bay plots and the planted interior disposal area.

The *A. germinans* plantings in the bay plots increased in relative mean percent cover for both the project and the reference plots (figure 8).



V. Conclusions

a. Project Effectiveness

Percent survival inside the remaining 32 plots (representing 40% of the original plots) indicated success in meeting the goal of increasing vegetation; more than half of the *P. amarum* survived and a small percentage of *S. patens* and *S. spartinae* remained. Although an increase in cover of these three species has been achieved, the survival/growth in these plots has not made up for the losses elsewhere on the dune, and the remaining vegetation is not substantial enough to keep the shoreline from quickly eroding away.

b. Recommended Improvements

There are no recommended improvements.

c. Lessons Learned

Although plantings were an appropriate method used to hold the dune in place for this particular project, installing plantings farther from the shoreface may have provided more time for the establishment and spread of the plantings.

