COASTAL WETLANDS PLANNING, PROTECTION, AND RESTORATION ACT

PROJECT INFORMATION SHEET
November 1997

Project Name:	Grand TerreVegetative Plantings Jefferson Parish, Louisiana
Project Area Size:	221 acres total composed of the following three areas: 115 acres of existing 1996 disposal area (Area 1) 80 acres future 1998 disposal area (Area 2) 102 acres front side of Grand Terre (Area 4)
Submitted By:	U.S. Department of Commerce, National Marine Fisheries Service
Marsh Type:	Saline

PROJECT DESCRIPTION

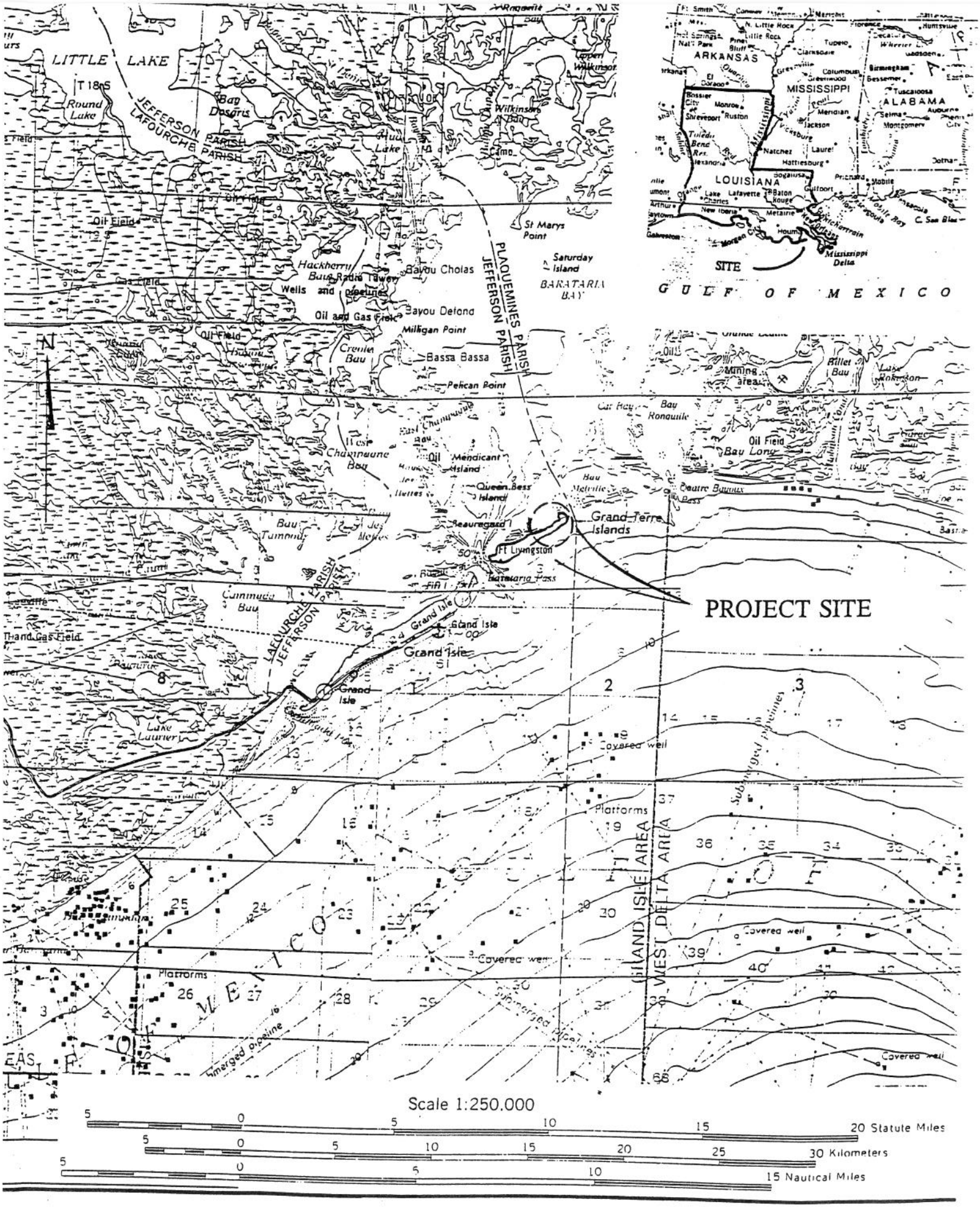
Grand Terre is a barrier island located adjacent to, and east of, Grand Isle, Louisiana (Figure 1). The island presently is approximately 550 acres in size and contains shallow water, intertidal marsh, scrub-shrub, and upland dune habitats. The intertidal marsh is vegetated primarily with smooth cordgrass and salt grass; higher elevation wetlands consist primarily of marshhay cordgrass. The 1996 Corps of Engineers disposal area is presently almost completely devoid of vegetation; having less than 1% coverage consisting of smooth cordgrass in a few spots within the containment dike borrow ditch.

The project consists of planting the 1996 disposal area (Area 1, Figure 2) with Atlantic panicgrass (Panicum amarum) and marshhay cordgrass (Spartina patens). Elevations as measured along transects GTI-2 and GTI-3 (Figure 3) average +4.8 ft NGVD and +5.0 ft NGVD respectively (Figures 4 and 5). As such, dune and swale species are the most appropriate vegetation. Prior to planting, the soil will be "tilled" using a spike tooth harrow to loosen the soil and allow the seeds to be covered.

Additionally, following the 1998 disposal event, that 80 acres (Area 2, Figure 2) will be planted with smooth cordgrass and black mangrove to ensure the spoil does not erode.

Finally, funds will be allocated to remove all cows and goats from the island and to purchase grazing rights for the duration of the project (20 years).

It is likely that volunteers working with the Coalition to Restore Coastal Louisiana and Jefferson Parish will assist in the planting effort. However, cost estimates reflect that work all will be fully



GRAND TERRE ISLAND
FIGURE 1

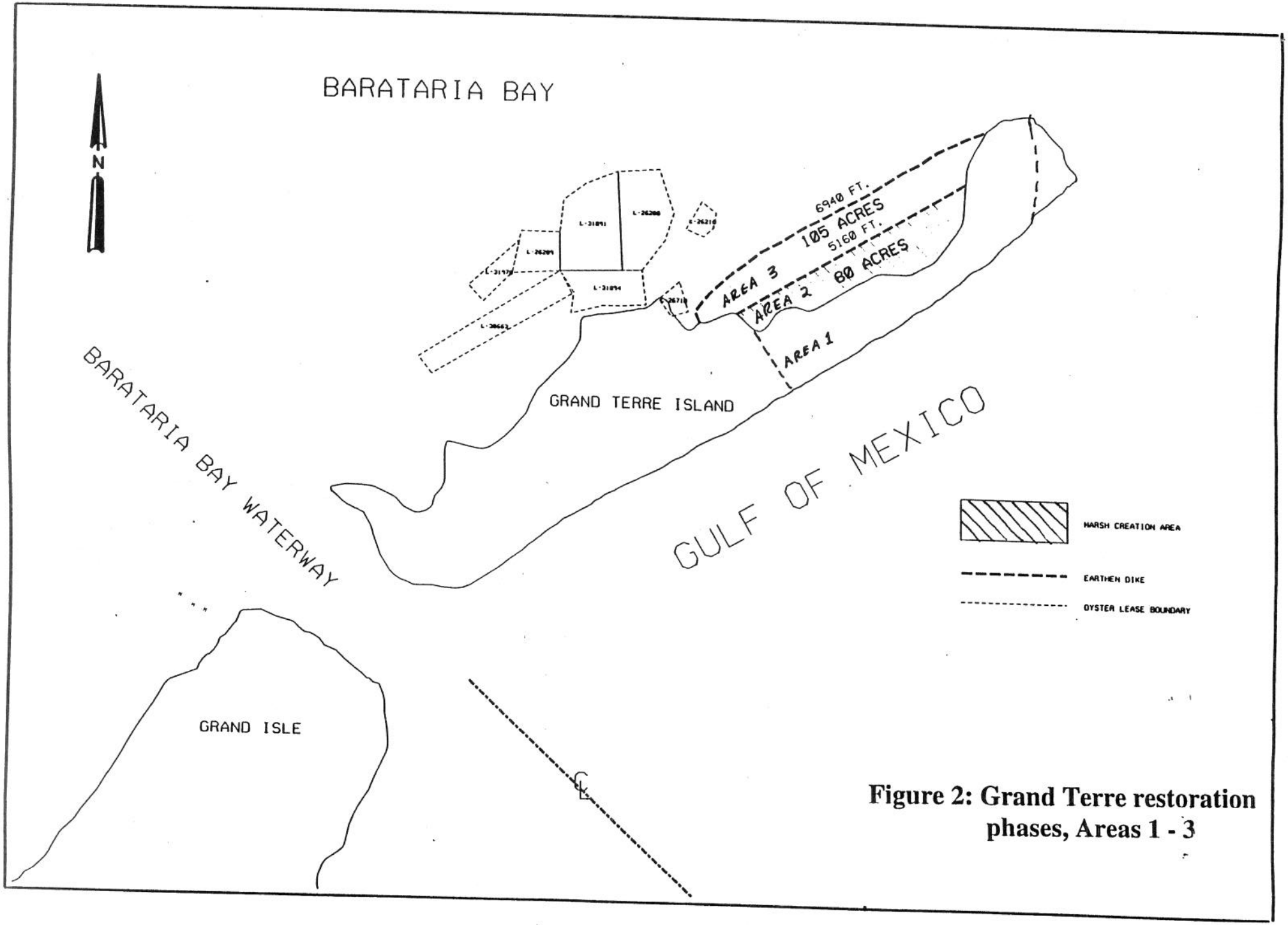


Figure 2: Grand Terre restoration phases, Areas 1 - 3

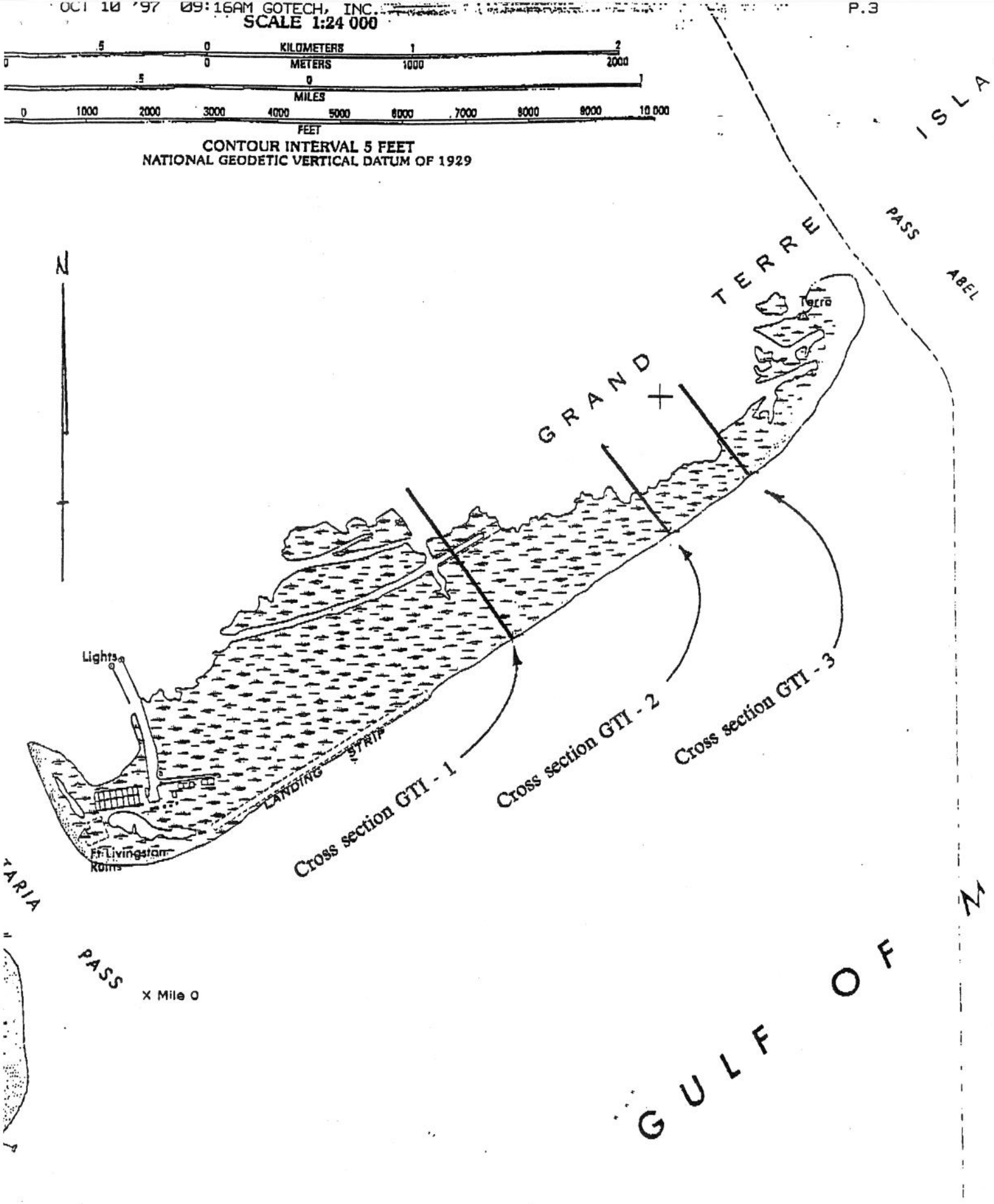
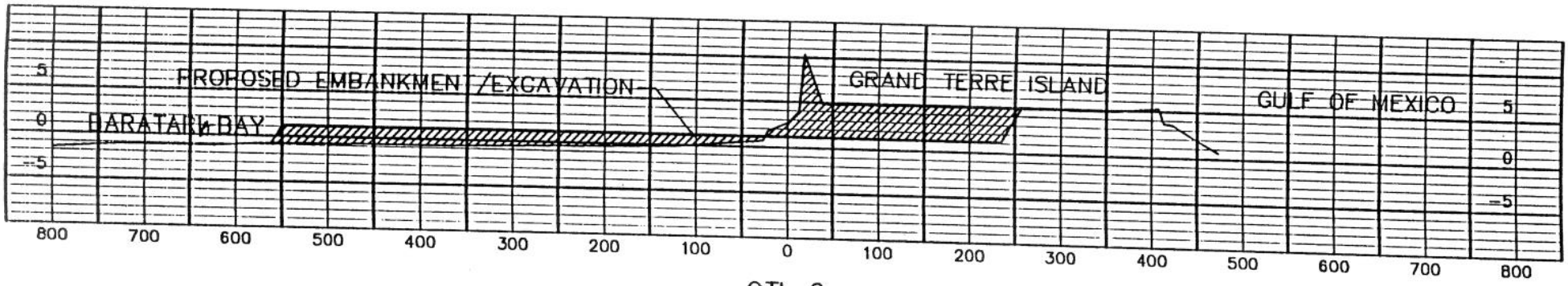


Figure 3: Grand Terre cross section locations - elevation survey



GTI–2
STATION = 31+82
EXCAVATION = 989.42 SQ.FT.
EMBANKMENT = 985 SQ.FT.

Figure 4: Grand Terre cross section GTI-2

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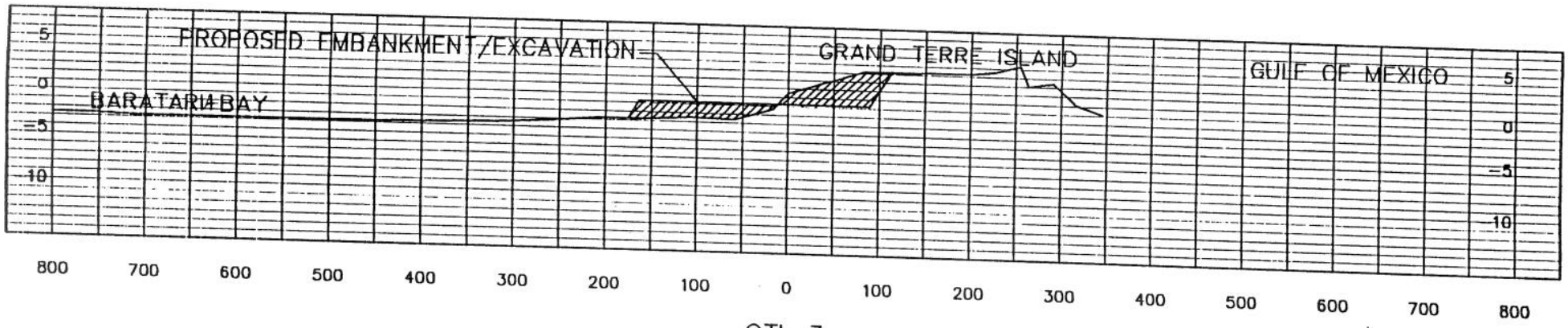

GTI–3
STATION = 48+00
EXCAVATION = 289.16 SQ.FT.
EMBANKMENT = 280.00 SQ.FT.

Figure 5: Grand Terre cross section GTI-3

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funded under this project.

Although it is not part of this project, it should be noted that the New Orleans District (NOD) and La. DNR will pay for the creation of 80 acres during FY1998 (Area 2). As part of this project, they will create an earthen containment dike on the northern side of Area 2. Additionally, using regular Operations and Maintenance funds, they will construct a rock containment dike along an alignment that would encompass a future Area 3 (Figure 2). This rock dike should help reduce bayside erosion of the containment areas and keep dredged material from impacting adjacent oyster reefs.

WETLAND LOSS DATA AND PROJECT RELATED INFORMATION

Shoreline erosion rates from McBride et al. (1992)

Back bay rates from transects 6 -9 (see figure 6), averaged by year and transformed from meters to feet. These transects are those that are within the portion of the project area on Grand Terre.

1884 - 1932 loss of 4.8 ft/yr
1932 - 1956 loss of 8.5 ft/yr
1956 - 1973 loss of 11.4 ft/yr
1973 - 1988 loss of 15.5 ft/yr
1884 - 1988 loss of 8.3 ft/yr

Gulf front erosion rates from transects 7 - 11 (see figure 6), averaged by year and transformed from meters to feet. These transects are those that are within the portion of the project area located on Grand Terre.

1884 - 1932 loss of 17.4 ft/yr
1932 - 1956 gain of 16.8 ft/yr
1956 - 1973 loss of 9.3 ft/yr
1973 - 1988 loss of 34 ft/yr
1884 - 1988 loss of 10.6 ft/yr

Boyd and Penland (1981), based on barrier island elevation measurements and expected water level changes due to various storm types, indicated that major fronts and tropical storms could result in 100% of the Barrataria Bay barrier islands being overwashed 10 to 30 times each year. They also stated that these figures overstate overwash for those islands near tidal inlets and tidal passes by an unknown amount. This area of Grand Terre was increasingly being overwashed. In spite of the placement of dredged material to elevations exceeding +5 ft NGVD during the period from mid-May through late August 1997, the island was overwashed at least once because the large front containment dikes present and mostly intact in May were almost entirely absent in August. Such overwash events are sure to remobilize much unvegetated and unprotected sediment from the containment areas. Additionally, overwash events in this narrow and unvegetated portion of the island could result in the creation of a tidal channel through the island, making restoration of Grand Terre more expensive and difficult.

TABLE 24 —*Plaquemines bayside magnitude of change (meters)*

Transect #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Transect coordinate		89° 56' 45"	30"	15"	89° 56' 00"	45"	30"	15"	89° 55' 00"	45"	30"	15"	89° 54' 00"	45"	30"	15"
Years	1884 - 1932	-77	-218	-140	-171	-213	-34	-82	-131	-33	-17	n.a.	-43	n.a.	926	0
	1932 - 1956	-16	-54	-74	-37	-28	-59	-75	-45	-68	-45	n.a.	-53	n.a.	-45	-84
	1956 - 1973	120	-75	-52	-61	-124	-97	-75	-37	-28	-48	n.a.	n.a.	n.a.	16	n.a.
	1973 - 1988	76	-31	-83	-78	-113	-102	-72	-64	-45	258	n.a.	n.a.	n.a.	n.a.	n.a.
	1884 - 1988	103	-378	-329	-347	-476	-292	-304	-277	-174	148	n.a.	n.a.	n.a.	n.a.	n.a.

TABLE 25 —*Plaquemines gulfside magnitude of change (meters)*

Transect #		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Transect coordinate		89° 56' 45"	30"	15"	89° 56' 00"	45"	30"	15"	89° 55' 00"	45"	30"	15"	89° 54' 00"	45"	30"	15"
Years	1884 - 1932	-356	-213	135	51	-48	-106	-160	-191	-263	-304	-354	n.a.	-630	n.a.	-474
	1932 - 1956	55	169	174	108	95	119	134	117	110	148	105	n.a.	-79	n.a.	-163
	1956 - 1973	82	-1	-168	-62	-12	23	14	34	10	-82	-214	n.a.	n.a.	-287	-459
	1973 - 1988	44	75	-128	-153	-111	-134	-118	-140	-141	-169	-207	n.a.	n.a.	n.a.	n.a.
	1884 - 1988	-175	30	13	-56	-76	-98	-130	-180	-284	-407	-670	n.a.	n.a.	n.a.	n.a.

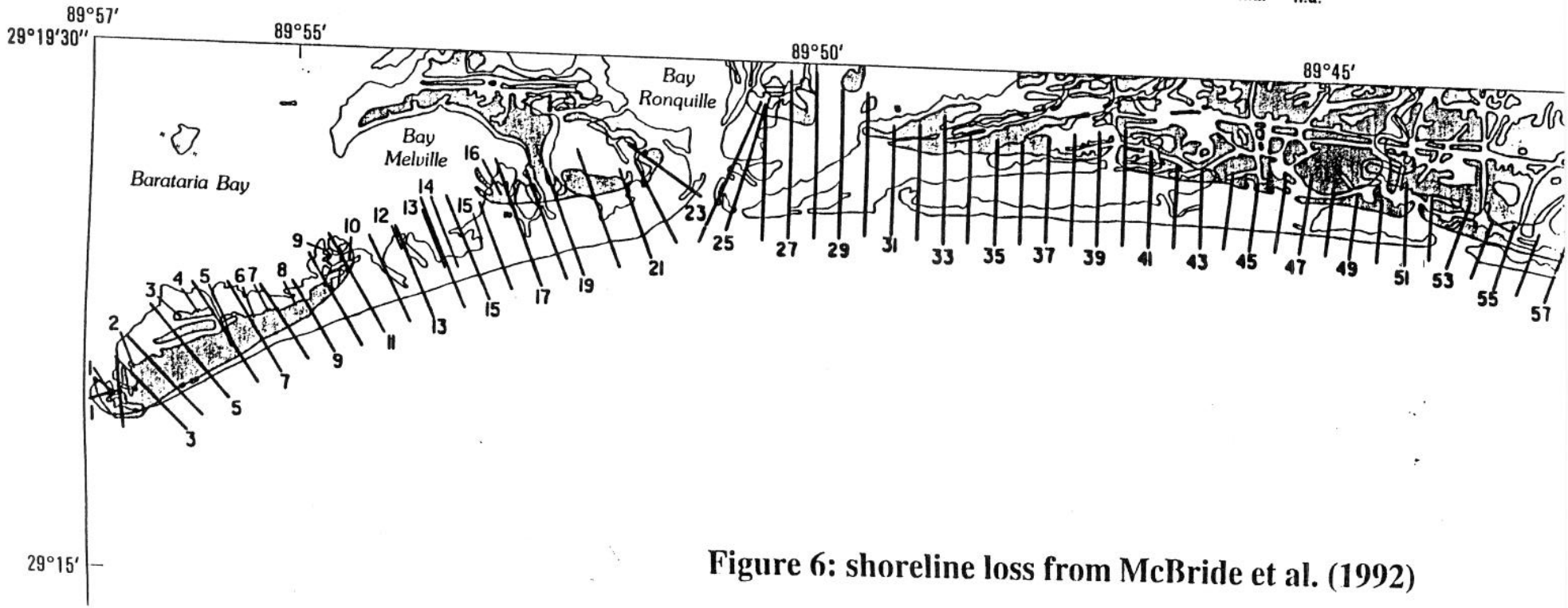

Figure 6: shoreline loss from McBride et al. (1992)

Although no grain size analysis of the dredged material was undertaken, it appears obvious from the rapid erosion of the containment dikes and the silty feel of the fill that the dredged material will erode more rapidly than normal dune sediments. Therefore, without revegetation, it is probable that shoreline erosion on both the front and back side of the island will be greater than recent historical rates.

The inclusion of the 26-acre Area 4 in the project area is supported by data and observations from Turner (1987) and Andresen et al. (1990). Turner (1987) reported that moderately intense feral horse grazing reduced plant biomass 29% and standing stocks of aboveground biomass decreased with increases in grazing. Heavily grazed plots had extremely low net aboveground primary production. In addition, grazing, clipping and trampling decreased standing stocks of live rhizomes, thereby reducing plant expansion rates. Andreson et al. (1990) reported salt marsh grazing by cattle decreased sedimentation rates. Reduction of sedimentation will accelerate sea level rise and lead to increased marsh/barrier island erosion rates. In addition, during the August field investigation, it was obvious that the cows were grazing on dune vegetation and destroying the plants, roots and all. Many barrier island projects in Louisiana and elsewhere have attempted to restore dunes to provide habitat for birds and to protect barrier islands from accelerated erosion. NRCS constructed sand fences on Timbalier Island primarily to help reduce barrier island susceptability to overwash and erosion. Vegetation helps build and maintain dunes by reducing wind, allowing for the deposition of sand, and by increasing substrate stability by binding the sand. Loss of dune vegetation accelerates loss of dunes, leading to higher barrier island erosion rates.

Future-without the revegetation project, it is probable that at least 50 cattle and 100 goats will continue to roam Grand Terre, destroying dune vegetation and selectively eating new vegetation as it attempts to sprout and colonize the disposal areas.

WETLAND VALUE ASSESSMENT (Areas 1 and 2)

For the purpose of theWVA, Areas 1 and 2 will be combined into one project area while Area 3 will be treated separately.

Area 1 and 2 assumptions:

1. At the recommendation of the academic group (Visser, Sasser and Rouse) we "combined" the loss data discussed above to arrive at a historic rate of 27 ft/yr. This group felt the 34 ft/yr rate might be unusually high because of Hurricane Juan which hit this part of Louisiana during this time and was especially destructive in the Grand Isle area. Therefore, we took the 34 ft/yr rate from 1973 - 1988 and "averaged it with the 20 ft/yr loss we developed from planimitry. Back bay rates we assumed to be 12 ft/yr (close to the 1956-1988 rate).

2. The New Orleans District's project to create 80 acres of emergent soil elevations and to install the rock breakwater will be implemented by Target Year 0.

3. FWOP the front shoreline will erode at 1.5 times the historic rate. This is because of the

lack of dune protecting the area, the lack of vegetation protecting against erosion, and the poor quality of the dredged material as beach sediment. With time, overwash will remove sediments from the disposal area, reducing soil elevations and making the area more susceptible to erosion. FWOP erosion rates on the bay side are assumed to be equal to 50% of historic rates. FWP the Gulf side erosion rates are equal to 75% of historic rates (25% credit for getting the cattle and goats off the island) while the bayside rates are 25% of historic rates. This reduction in loss rates FWP for the bayside shoreline results from a combination of rock shoreline protection installed by NOD and the vegetation to be planted under this project. (We have previously assumed vegetation reduced shoreline erosion by at least 25%.)

4. Unvegetated emergent areas get no credit as marsh until vegetated (how it was done previously for dedicated dredging projects).

5. FWOP the goats and cattle will remain on the island. The disposal area will never revegetated completely because the animals will tend to selectively graze on the newer more tender vegetation and shoots. The highest coverage of vegetation FWOP will be 50% beginning at Target Year 10.

6. The following Target Years will be used:
   TY 1 - project implemented, Areas 1 and 2 planted, 50% of total area vegetated
   TY 3 - 100% of total area vegetated
   TY 5 - FWOP 25% of disposal areas vegetated (probably high for Area 2)
   TY 10 - FWOP 50% of disposal areas vegetated
   TY 20 - Completion of analysis

V1 - EMERGENT MARSH

Pertinent numbers used in computing emergent <u>acreage</u> of the project area are provided below. This amount is <u>not</u> the same as marsh acreage because of assumption 3.

Length of shoreline - 7,000 ft gulf side and bay side each
FWOP gulfside erosion rate - 41 ft/yr (27 x 1.5) = 6.58 acres lost per year
FWOP bayside erosion rate - 6 ft/yr = .96 acres lost per year
FWP gulfside erosion rate - 20 ft/yr = 3.2 ac/yr
FWP bayside erosion rate - 3 ft/yr = 0.48 ac/yr

Target Year	Emergent Acreage (Start)	Gulfside Loss (ac)	Baywide Loss (ac)	Emergent Acreage (end)	Percent Coverage	Marsh Acreage	Percent Project Area
FWOP							
0				195	1	~~2~~ 0	~~1%~~ 0
1	195	7	1	187	3	0	0
3		13	2	172	10	9	5
5		13	2	157	25	39	20
10		33	5	119	50	60	31
20		66	10	43	50	22	11
FWP							
1	195	3	.48	191	50	96	0
3		6	1	184	100	92	47
5		6	1	177	100	177	~~94~~ 91
10		16	2.4	159	100	159	82
20		32	4.8	122	100	122	63

V2 - SUBMERGED AQUATIC VEGETATION

There will be no submerged aquatic vegetation within the project area future without and future with project implementation.

V3 - INTERSPERSION

Because of the linear nature of the shoreline erosion, V3 in this case is a mirror image of V1. However, the numbers associated with V3 will be emergent acreage in the table above, not marsh acreage. The following estimates are based on dividing the emergent marsh figure (end) by the total project area, putting most of the marsh area into category 1, and the water and a few percentages of marsh into category 4.

	FWOP	FWP
TY0	100% @ 1	100% @ 1
TY1	100% @ 1	100% @ 1
TY3	100% @ 1	100% @ 1
TY5	80% @ 1, 20% @ 4	100% @ 1
TY10	60% @ 1, 40% @ 4	80% @ 1, 20% @ 4
TY20	20% @ 1, 80% @ 4	60% @ 1, 40% @ 4

V4 - WATER DEPTH (percent of water less than 1.5 ft deep)

It is assumed that only the first 20 ft of water immediately adjacent to the spoil area will be less than 1.5 ft deep. This is approximately 3.2 acres. Dividing that by the water acreage gives the appropriate estimate.

	FWOP	FWP
TY0	100%	
TY1	80 ~~40% (3.2/8)~~	100 ~~80% (3.2/4)~~
TY3	28 ~~14%~~	58 ~~29% (3.2/11)~~
TY5	16 ~~8%~~	36 ~~18%~~
TY10	8 ~~4%~~	18 ~~9%~~
TY20	4 ~~2%~~	8 ~~4%~~

V5 - SALINITY

No source of salinity data was available. However, because the project is a barrier island it is assumed salinities will be optimal for saline marsh. Project implementation will not affect salinity levels

Assume average salinities of 15 ppt future without and future with project implementation

V6 - FISHERY ACCESS

Presently, there is no fishery access to Area 1 because of elevations exceeding intertidal levels. This will change over time naturally as the areas open up and subside.

	FWOP	FWP
TY 0	.0001	.0001
TY 1	.0001	.0001
TY 3 and the remaining years	1	1

AREA 4

The project area is 102 acres (7,894 linear ft of Grand Terre beach x 28 ft erosion/yr x 20 yrs)/ 43,560 ft per acre. Assumptions - Removal of the goats and cattle off the island will allow for greater vegetative colonization of dune habitat and will slow down shoreline erosion rates by

66.16 FMMMs
97 AAAs

Coastal Wetland Planning, Protection and Restoration Act
Wetland Value Assessment Worksheet

Area 1 - 115 ac. disposal area
Area 2 - 80 ac. future disposal area - the area is primarily unvegetated spoil

Project: Grand Terre Veg. Plt'g.

Date: 10/22/97

Wetland Type: Saline

Land Loss Rate:

Marsh Acreage: 0 ac

Water Acreage: 0 ac

Total Acreage: 195

	Target Year	V1 % Marsh	V2 % SAV	V3 Marsh Edge	V4 Water <= 1.5'	V5 Salinity	V6 Fish Access
	TY0	0 % 0 ac	0 %	100-1	100 %	15 ppt	0.001
FWOP	1	0 ac 0 %		100-1	80 %		0.001
	3	8.5 5 %		100-1	28 %		1.0
	5	39 20 %		80-1 / 20-4	16 %		
	10	60 31 %		60-1 / 40-4	8 %		
	20	22 11 %		20-1 / 80-4	4 %		
FWP	1	0 0 %		100-1	100 %		0.001
	3	92 47 %		100-1	58 %		1.0
	5	177 91 %		100-1	36 %		1.0
	10	159 82 %		80-1 / 20-4	18 %		
	20	122 63 %		60-1 / 40-4	8 %		

Remarks:

14 AAAs

21 mon. Ac. of TY20

Coastal Wetland Planning, Protection and Restoration Act
Wetland Value Assessment Worksheet

Area 4

Project: Grand Terre Veg. Plt'g.

Date: 10/22/97

Marsh Acreage: 99 ac

Wetland Type: Saline

Water Acreage: 3 ac

Land Loss Rate: 28'/yr FWOP
20'/yr FWP

Total Acreage: 102 ac

	Target Year	V1 % Marsh	V2 % SAV	V3 Marsh Edge	V4 Water <= 1.5'	V5 Salinity	V6 Fish Access
	TY0	99 ac 97%	0%	100%-1	100%	15ppt	1:0
FWOP	1	94 ac 92%		↓	90%		
	20	0 ac 0%		100%-5	5%		
FWP	1	95 ac 93%		100%-1	90%		
	20	27 ac 26%	↓	100%-4	7%	↓	↓

Remarks: