

Coastal Wetlands Planning, Protection And Restoration Act

**BARATARIA BASIN LANDBRIDGE SHORELINE PROTECTION PROJECT PHASE 4
BA-27d**

Eleventh Priority List

REVISED

PROJECT INFORMATION PACKAGE

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(Revised Based on 95% Design Review information and EnvWG Comments)

NRCS Contacts:

Quin Kinler (WVA)

225-382-2047

John Jurgensen (Engineering / Cost)

318-473-7694

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

Coast 2050 Strategy

Region 2 Regional Strategy #24: Preserve bay and lake shoreline integrity on the landbridge.

Project Location

Region 2, Barataria Basin, Jefferson Parish.

Phase 4 begins at the intersection of Bayou Rigolettes and Barataria Waterway, and extends about 27,951 feet southward along the east bank of Bayou Rigolettes tying in to the northern limit of Phases 1 and 2.

Objectives

The objective of this project is to eliminate shoreline erosion for the area referenced above. Secondary benefits would include maintenance, and increased extent, of submerged aquatic vegetation on the protected side of project features where such features form protected coves.

Proposed Solution

The shoreline protection will consist of approximately 27,951 feet of rock revetment, with an elevation of 3.5 feet NAVD88, a top width of 4 feet, and side slopes of 3:1. The revetment will be constructed of COE R-400 (rock specification) and will be underlain with a geotextile cloth. Seven site-specific organism/drainage openings will be incorporated; the openings will have a sill elevation of 2 feet below average tide. The width of the openings will be approximately equal to the controlling width of the existing channel at a point 20 to 50 feet toward the marsh interior from the channel mouth.

Approximately 36,500 feet of construction access channel, with a bottom elevation of -5.5 feet NAVD88 and bottom width of 80 feet, will be excavated. Excavated material will be deposited in Bayou Rigolettes adjacent to the access channels and returned to the access channels upon completion of construction.

The proposed shoreline protection features will be designed to compensate for initial settlement. Maintenance will be performed within a few years after construction and again in the later portion of the project life.

Need for Revised WVA

The original WVA benefits were largely based on an estimate of the extent of shoreline erosion that would be prevented over the 20-year project life. The acreage of without project shoreline erosion was estimated based on an annual erosion rate and length of shoreline protected. The length of shoreline to be protected has been refined during project design. The original WVA was based on an estimated 31,500 feet of shoreline protection. This revised WVA is based on a design survey length of 27,951 feet of shoreline protection.

Barataria Basin Landbridge Shoreline Protection Project Phase 4(BA-24-4 / BA-27d)

1993 Land / Water (DNR-USGS)

	Acres	%
Water	69	9
Land	698	91
Total	767	100

Interior Land Loss Rates (COE)

Period	Loss Rate
74-90	0.13% / yr
83-90	0.20% / yr

1988/90 DNR-USGS Habitat Data -- Summarized

	Acres	%
Water	87	11
Fresh	87	11
Brackish	583	76
Upland S/S	7	1
Upland Forest		
Developed	2	1
Total	766	100

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

Marsh / Water Acreage Adjustment Through 2003

1990 marsh from Habitat Data (brack + fresh only)	670
1990 total area (brack + fresh + water only)	757
1990 interior water	87
1990 % emergent marsh	88.51

Acres lost to erosion = [(3.49 ft/yr X 4,138 ft) + (26.17 ft/yr X 23,813 ft)]/43560 X .8851 = 12.96/yr

Note: erosion rates calculated from USGS for period of 1971-1998

Acres/yr lost to erosion	12.96
83-90 loss rate	0.0020

Year	Interior Water Acres begin TY	Em Acres begin TY	Em Acres Loss to Erosion	Em Acres adjusted for erosion	Interior loss rate	Em Acres Interior Loss	Em Acres end TY	Interior Water Acres end TY
1990							670	87
1991	87.0	670.0	12.96	657.0	0.0020	1.31	655.7	88.3
1992	88.3	655.7	12.96	642.8	0.0020	1.29	641.5	89.6
1993	89.6	641.5	12.96	628.5	0.0020	1.26	627.3	90.9
1994	90.9	627.3	12.96	614.3	0.0020	1.23	613.1	92.1
1995	92.1	613.1	12.96	600.1	0.0020	1.20	598.9	93.3
1996	93.3	598.9	12.96	586.0	0.0020	1.17	584.8	94.5
1997	94.5	584.8	12.96	571.8	0.0020	1.14	570.7	95.6
1998	95.6	570.7	12.96	557.7	0.0020	1.12	556.6	96.7
1999	96.7	556.6	12.96	543.6	0.0020	1.09	542.6	97.8
2000	97.8	542.6	12.96	529.6	0.0020	1.06	528.5	98.9
2001	98.9	528.5	12.96	515.6	0.0020	1.03	514.5	99.9
2002	99.9	514.5	12.96	501.6	0.0020	1.00	500.6	100.9
2003	100.9	500.6	12.96	487.6	0.0020	0.98	486.6	101.9

Begin WVA w/ these
acres

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

V1 (% Emergent Marsh)

V1 Without Project

Shoreline Erosion

$(3.49 \text{ ft/yr} \times 4,138 \text{ ft of shore}) + (26.17 \text{ ft/yr} \times 23,813 \text{ ft of shore}) / 43560 \times .8851 = 12.96 \text{ ac/yr}$

Note: 1990 Habitat data showed 88.51 % of project area as marsh.

Interior Land Loss

COE interior loss rate for 83-90 = .20% per year.

Adjust rate for Davis Pond by reducing rate 15%.

Therefore: $.20 \times .85 = .17\%$ per year.

However, without shoreline protection, the existing connections of the interior marsh to Bayou Rigolettes will be more numerous and larger; thereby increasing the interior loss rate in the future. This prediction is supported by the increase in land loss rate from 74-93 (.13% per year) to 83-90 (.20% per year). Relative to the DP-adjusted rate, assume a 10% increase in interior land loss for the without project scenario: (DP adjusted rate for 83-90 $\times 1.10$ or $.0017 \times 1.10 = .19\%$ per year)

Shoreline Erosion and Interior Land Loss Combined

Each year, subtract shoreline erosion acreage then apply adjusted loss rate to remaining acreage. See table next page.

V1 With Project

Shoreline Erosion

Shoreline Erosion will be eliminated.

Interior Land Loss

Assume DP-adjusted 83-90 loss rate continues (.17%/ yr). See table next page.

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

Marsh / Water Acreage Calculations

Baseline Marsh Acreage Adjusted to 2003	487	83-90 loss rate	0.0020
Baseline Water Acreage Adjusted to 2003	102	Davis Pond loss rate reduction	15%
Baseline Total Area Adjusted to 2003	589	Davis Pond-adjusted loss rate	0.0017
Acres/yr lost to erosion	12.96	FWOP loss rate increase	10%
		FWOP loss rate	0.0019
		FWP loss rate reduction	0.0000
		FWP adjusted loss rate	0.0017

FWOP Acreage Calculations

FWP Acreage Calculations

Target year	Em Acres begin TY	Em acres adjusted for erosion	FWOP loss rate	Em acres end TY	Water acres end TY	% Emerg End TY	Target year	Em Acres begin TY	FWP loss rate	Em acres end TY	Water acres end TY	% Emerg end TY
0				487.0	102.0	82.7	0			487.0	102.0	82.7
1	487.0	474.0	0.0019	473.1	115.9	80.3	1	487.0	0.0017	486.2	102.8	82.5
2	473.1	460.2	0.0019	459.3	129.7	78.0	2	486.2	0.0017	485.3	103.7	82.4
3	459.3	446.3	0.0019	445.5	143.5	75.6	3	485.3	0.0017	484.5	104.5	82.3
4	445.5	432.5	0.0019	431.7	157.3	73.3	4	484.5	0.0017	483.7	105.3	82.1
5	431.7	418.8	0.0019	418.0	171.0	71.0	5	483.7	0.0017	482.9	106.1	82.0
6	418.0	405.0	0.0019	404.2	184.8	68.6	6	482.9	0.0017	482.1	106.9	81.8
7	404.2	391.3	0.0019	390.5	198.5	66.3	7	482.1	0.0017	481.2	107.8	81.7
8	390.5	377.6	0.0019	376.8	212.2	64.0	8	481.2	0.0017	480.4	108.6	81.6
9	376.8	363.9	0.0019	363.2	225.8	61.7	9	480.4	0.0017	479.6	109.4	81.4
10	363.2	350.2	0.0019	349.6	239.4	59.4	10	479.6	0.0017	478.8	110.2	81.3
11	349.6	336.6	0.0019	336.0	253.0	57.0	11	478.8	0.0017	478.0	111.0	81.1
12	336.0	323.0	0.0019	322.4	266.6	54.7	12	478.0	0.0017	477.2	111.8	81.0
13	322.4	309.4	0.0019	308.9	280.1	52.4	13	477.2	0.0017	476.3	112.7	80.9
14	308.9	295.9	0.0019	295.3	293.7	50.1	14	476.3	0.0017	475.5	113.5	80.7
15	295.3	282.4	0.0019	281.8	307.2	47.8	15	475.5	0.0017	474.7	114.3	80.6
16	281.8	268.9	0.0019	268.4	320.6	45.6	16	474.7	0.0017	473.9	115.1	80.5
17	268.4	255.4	0.0019	254.9	334.1	43.3	17	473.9	0.0017	473.1	115.9	80.3
18	254.9	242.0	0.0019	241.5	347.5	41.0	18	473.1	0.0017	472.3	116.7	80.2
19	241.5	228.5	0.0019	228.1	360.9	38.7	19	472.3	0.0017	471.5	117.5	80.1
20	228.1	215.1	0.0019	214.7	374.3	36.5	20	471.5	0.0017	470.7	118.3	79.9

FWOP net loss 272.3

FWP net loss 16.3

Net Acres at TY20 256.0

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

V2 (% Submerged Aquatic Vegetation)

V2 Without Project

TY0 -- Presently, SAV is estimated at 50%.

TY1 – About 14 ac. of marsh would convert to open water. This additional open water is not expected to support SAVs. Therefore SAV % is reduced from 50% to 44%.

TY20 – About 272 ac. of marsh would convert to open water. This additional open water is not expected to support SAVs. Therefore SAV % is reduced from 50% in TY0 to 14% in TY20.

V2 With Project

TY0 -- Presently, SAV is estimated at 50%.

TY1 and TY20 – The rock revetment is expected to hold shoreline position and maintain existing level of water exchange between the interior marsh and Bayou Rigolettes. Therefore SAV % is projected to remain 50%.

V3 (Interspersion)

V3 Without Project

TY0 – Presently, the project area appears to be 40% Class 1 and 60% Class 2.

TY1 – With less than 3% reduction in percent of emergent marsh, interspersion would remain 40% Class 1 and 60% Class 2.

TY20 – The 260 acres lost to shoreline erosion would become Class 4 (about 44% of project area). The remaining marsh would maintain the original ratio of Class 1 to Class 2 (22% and 34% respectively).

V3 With Project

TY0 – Presently, the project area appears to be 40% Class 1 and 60% Class 2.

TY1 – With less than 1% reduction in % of emergent marsh, interspersion would remain 40% Class 1 and 60% Class 2.

TY20 – The 16 acres of interior land loss (<4% loss) would probably not cause a change in Interspersion.

Barataria Basin Landbridge Shoreline Protection Project Phase 4 (BA-27d)

V4 (Water Depth)

V4 Without Project

TY0 – Presently, percent of water less than 1.5 feet is estimated at 40%.

TY1 – About 14 ac. of marsh would convert to open water. This additional open water is expected to be deeper than 1.5 feet. Therefore, the percent of water less than 1.5 feet is expected to decrease from 40% to 35%.

TY20 – About 272 ac. of marsh would convert to open water. This additional open water is expected to be deeper than 1.5 feet. Therefore percent of water less than 1.5 feet is reduced from 40% in TY0 to 11% in TY20.

V4 With Project

TY0 – Presently, percent of water less than 1.5 feet is estimated at 40%.

TY1 – With shoreline protection, water depths are not expected to change.

TY20 – With shoreline protection, water depths are not expected to change.

V5 Salinity

The project is not anticipated to have any significant effect on salinity.

V6 Aquatic Organism Access

The shoreline revetment includes seven openings at existing channels, as coordinated with NMFS, to allow continued aquatic organism access.

Barataria Basin Landbridge Shoreline Project Phase 4 (BA-24-4 / BA-27d)

Intermediate Marsh (as classified by Chabreck et al. in 1997)

Without Project Summary

	TY 0	TY 1	TY 20
Em. Marsh Acres	487	473	215
Water Acres	102	116	374
Total Acres	589	589	589
V1 (% Em. marsh)	83	80	36
V2 (% SAV)	50	44	14
V3 (Interspersion)	1 – 40% 2 – 60% 3 – 4 –	1 – 40% 2 – 60% 3 – 4 –	1 – 22% 2 – 34% 3 – 4 – 44%
V4 (% Water <1.5')	40	35	11
V5 (Salinity)	3	3	3
V6 (Fish Access)	1	1	1

With Project Summary

	TY 0	TY 1	TY 20
Em. Marsh Acres	487	486	471
Water Acres	102	103	118
Total Acres	589	589	589
V1 (% Em. marsh)	83	83	80
V2 (% SAV)	50	50	50
V3 (Interspersion)	1 – 40% 2 – 60% 3 – 4 –	1 – 40% 2 – 60% 3 – 4 –	1 – 40% 2 – 60% 3 – 4 –
V4 (% Water <1.5')	40	40	40
V5 (Salinity)	3	3	3
V6 (Fish Access)	1	1	1

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Fresh/Intermediate Marsh

Project: **Barataria Basin Landbridge Shoreline Protection**
Phase 4 - BA-27d
 Condition: Future Without Project

Project Area:
 Fresh.....
 Intermediate. **589**

Variable		TY 0		TY 1		TY 20	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	83	0.85	80	0.82	36	0.42
V2	% Aquatic	50	0.55	44	0.50	14	0.23
V3	Interspersion	%		%		%	
	Class 1	40	0.76	40	0.76	22	0.51
	Class 2	60		60		34	
	Class 3						
	Class 4						
	Class 5					44	
V4	%OW <= 1.5ft	40	0.55	35	0.49	11	0.22
V5	Salinity (ppt)						
	fresh intermediate	3	1.00	3	1.00	3	1.00
V6	Access Value						
	fresh intermediate	1.00	1.00	1.00	1.00	1.00	1.00
Emergent Marsh HSI =		0.87		EM HSI =	0.85	EM HSI =	0.55
Open Water HSI =		0.67		OW HSI =	0.63	OW HSI =	0.38

1 1 1
 0.6 0.6 0.6
 0 0 0
 0 0 0.2

 1.00 1.00 1.00
 1.00 1.00 1.00

Project: **Barataria Basin Landbridge Shoreline Protection**
 FWOP

Variable							
		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
	Class 5						
V4	%OW <= 1.5ft						
V5	Salinity (ppt)						
	fresh intermediate						
V6	Access Value						
	fresh intermediate						
EM HSI =				EM HSI =		EM HSI =	
OW HSI =				OW HSI =		OW HSI =	

0 0 0
 0 0 0
 0 0 0
 0 0 0

Project: **Barataria Basin Landbridge Shoreline Protection**
 FWOP

Variable							
		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion Class 1 Class 2 Class 3 Class 4 Class 5	%		%		%	
V4	%OW <= 1.5ft						
V5	Salinity (ppt) fresh intermediate						
V6	Access Value fresh intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

0 0 0
 0 0 0
 0 0 0
 0 0 0

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

Fresh/Intermediate Marsh

Project: **Barataria Basin Landbridge Shoreline Protection**
Phase 4 - BA-27d
 Condition: Future With Project

Project Area:
 Fresh.....
 Intermediate. 589

Variable		TY 0		TY 1		TY 20	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	83	0.85	83	0.85	80	0.82
V2	% Aquatic	50	0.55	50	0.55	50	0.55
V3	Interspersion	%		%		%	
	Class 1	40	0.76	40	0.76	40	0.76
	Class 2	60		60		60	
	Class 3						
	Class 4						
V4	%OW <= 1.5ft	40	0.55	40	0.55	40	0.55
V5	Salinity (ppt) fresh intermediate	3	1.00	3	1.00	3	1.00
V6	Access Value fresh intermediate	1.00	1.00	1.00	1.00	1.00	1.00
Emergent Marsh HSI =		0.87		EM HSI =	0.87	EM HSI =	0.85
Open Water HSI =		0.67		OW HSI =	0.67	OW HSI =	0.67

1	1	1
0.6	0.6	0.6
0	0	0
0	0	0
1.00	1.00	1.00
1.00	1.00	1.00

Project: **Barataria Basin Landbridge Shoreline Protection**
 FWP

Variable							
		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion	%		%		%	
	Class 1						
	Class 2						
	Class 3						
	Class 4						
V4	%OW <= 1.5ft						
V5	Salinity (ppt) fresh intermediate						
V6	Access Value fresh intermediate						
EM HSI =				EM HSI =		EM HSI =	
OW HSI =				OW HSI =		OW HSI =	

0	0	0
0	0	0
0	0	0
0	0	0

Project: **Barataria Basin Landbridge Shoreline Protection**
FWP

Variable							
		Value	SI	Value	SI	Value	SI
V1	% Emergent						
V2	% Aquatic						
V3	Interspersion Class 1 Class 2 Class 3 Class 4 Class 5	%		%		%	
V4	%OW <= 1.5ft						
V5	Salinity (ppt) fresh intermediate						
V6	Access Value fresh intermediate						
		EM HSI =		EM HSI =		EM HSI =	
		OW HSI =		OW HSI =		OW HSI =	

0 0 0
0 0 0
0 0 0
0 0 0

AAHU CALCULATION - EMERGENT MARSH

Project: **Barataria Basin Landbridge Shoreline Protection**
Phase 4 - BA-27d

Future Without Project			Total HUs	Cummulative HUs
TY	Marsh Acres	x HSI		
0	487	0.87	425.06	
1	473	0.85	404.31	414.65
20	215	0.55	117.92	4710.97
			AAHUs =	256.28

Future With Project			Total HUs	Cummulative HUs
TY	Marsh Acres	x HSI		
0	487	0.87	425.06	
1	486	0.87	424.19	424.63
20	471	0.85	402.60	7853.67
			AAHUs	413.91

NET CHANGE IN AAHUs DUE TO PROJECT			
A. Future With Project Emergent Marsh AAHUs	=		413.91
B. Future Without Project Emergent Marsh AAHUs	=		256.28
Net Change (FWP - FWOP) =			157.63

AAHU CALCULATION - OPEN WATER

Project: Barataria Basin Landbridge Shoreline Protection
Phase 4 - BA-27d

Future Without Project			Total HUs	Cummulative HUs
TY	Water Acres	x HSI		
0	102	0.67	68.12	
1	116	0.63	72.69	70.50
20	374	0.38	143.43	2251.81
			AAHUs =	116.12

Future With Project			Total HUs	Cummulative HUs
TY	Water Acres	x HSI		
0	102	0.67	68.12	
1	103	0.67	68.79	68.45
20	118	0.67	78.81	1402.15
			AAHUs	73.53

NET CHANGE IN AAHUs DUE TO PROJECT		
A. Future With Project Open Water AAHUs	=	73.53
B. Future Without Project Open Water AAHUs	=	116.12
Net Change (FWP - FWOP)	=	-42.59

TOTAL BENEFITS IN AAHUs DUE TO PROJECT		
A. Emergent Marsh Habitat Net AAHUs	=	157.63
B. Open Water Habitat Net AAHUs	=	-42.59
Net Benefits=(2.1xEMAAHUs+OWAAHUs)/3.1		93.05