Sweet Lake/Willow Lake (CS-11b)

Candidate Project for the Fifth Priority List of the

Coastal Wetlands Planning, Protection and Restoration Act

Candidate Project Fact and Information Sheets for Wetland Value Assessment

Proposed by:

USDA - Natural Resources Conservation Service
and
Louisiana Department of Natural Resources

07 September 1995 (revised - post-WVA)

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{Refer to CS-11b, May 16 1994 COE/DNR for 4th Yr. List}
{Refer to CS-11b, Jan 11 1993 DNR for 3rd Yr. List}

Coastal Wetlands Planning, Protection and Restoration Act

CS-11b Sweet Lake/Willow Lake

Project Information Sheet

Project Name: CS-11b Sweet Lake/Willow Lake
Submitted By: Natural Resources Conservation Service
Project Area Size: **Total area:** 5796 acres [996 acres fresh marsh, 4800 acres water]

Willow Lake: 380 ac. marsh, 939 ac. water = 1319 ac.
Sweet Lake: 536 ac. marsh, 2341 ac. water = 2877 ac.
Interior: 80 ac. marsh, 1520 ac. water = 1600 ac.

Project Description:

The northern shoreline of the GIWW has eroded into Sweet Lake and Willow increasing turbidity in the waters of these lakes. Severe wind-induced wave erosion is also occurring along the northern, northwestern, and eastern shorelines. Water exchange will be reduced by re-establishing the hydrologic boundary between the GIWW and lakes and shoreline protection as a result of plantings. In addition the construction of terraces in the interior will reduce fetch and return this area to a productive marsh.

Project Components:

Sweet Lake:
1. Rock Rip-rap Embankment - 14,200 feet
2. Vegetative Plantings - 28,300 linear feet

Willow Lake:
1. Rock Rip-rap Embankment - 4,000 feet
2. Vegetative Plantings - 17,700 linear feet

Eroded Marsh:
1. Terraces - 25,500 feet
2. Vegetative Plantings - 2 rows

Present Conditions:

1. Acres of vegetated marsh and listing of most common plant species present.

   996 acres (17%)
   Willow Lake: 380 ac. marsh (29%)
   Sweet Lake: 536 ac. marsh (19%)
   Interior: 80 ac. marsh (05%)

Common plant species taken by WVA working group on 26 April 1994 (CWPPRA 4th Year Candidate Project Information Sheet):

60%	Bulltongue	*Sagittaria lancifolia*
15%	Cattail	*Typha latifolia*
15%	Marshhay Cordgrass	*Spartina patens*
Tr.	Alligatorweed	*Alternanthera philoxeroides*
Tr.	Roseau	*Phragmites communis*
Tr.	Paille Fine	*Panicum hemitomon*
Tr.	Elephant-ear	*Colocasia antiquorum*
Tr.	Rattlebox	*Sesbania drumondii*
Tr.	Black Willow	*Salix nigra*
Tr.	Buttonbush	*Cephalanthus occcidentalis*

2. Acres of open water.

4800 ac. (83%)
Willow Lake: 939 ac. water (71%)
Sweet Lake: 2341 ac. water (81%)
Interior: 1520 ac. water (95%)

3. Percent of open water listed in #2 dominated by aquatic plants (≥ 50% canopy cover).

15% in lakes - Refer to information from CS-11B 4th Year Information Sheet (16 May 1994 revision)

40% of Interior area

Submerged and floating aquatic species present according to WVA working group on 26 April 1994 (CWPPRA 4th Year Candidate Project Information Sheet):

Water Hyacinth	*Eichhornia crassipes*
American Lotus	*Nelumbo lutea*
Pondweed	*Potamogeton* sp.
Coontail	*Ceratophyllum demersum*
Floating Waterprimrose	*Ludwigia peploides*
Eurasian Watermilfoil	*Myriophyllum spicata*
White Waterlily	*Nymphaea odorata*

4. Historical information on marsh loss trends. *(provide references, if available, or methods used to derive information given)*

1.13% average percent land loss between 1983-1990, based on information compiled by Dell Britsch of the COE, who provided the following historical data on land loss in the project area:

Time Period:	Avg. % Land Loss
1933-1955	0.072
1958-1974	2.736
1974-1983	0.461
1983-1990	1.134 (1.150 WVA 1994)

11. Location of structures, culverts, breaks in spoil banks, etc. that serve as hydrologic connections and are not identified above or are not easily seen by examination of aerial photography.

N/A

12. Estimated subsidence rate. *(provide reference if available)*

0.15 in/yr Average of three stations in Penland et al. (1989) and estimates from Coastal Environments, Inc. for DNR as listed in 1994 WVA Information Sheet)

Future Conditions:

1. Location, type, and operation of proposed structures and water control systems.

N/A

2. Proposed hydrological changes (water introductions, circulation routes, etc.) due to the project.

Return to more historic conditions

3. Project Benefits:

V1 Emergent Vegetation

a-1. Acres of emergent marsh predicted to be gained/lost without project.

Sweet Lake:
TY 0: 536 ac. of emergent marsh occupying 19% of the 2877 ac. area.
TY 1: 12 ac. lost leaving 524 ac. or 18% of the area covered by marsh.
TY 10: 124 ac. lost leaving 412 ac. or 14% of the area covered by marsh.
TY 20: 247 ac. lost leaving 289 ac. or 10% of the area covered by marsh.

1a. Shoreline loss at TY 20 (southern):
(7,392 ft x 3.9 ft/yr x 20 yr)/43560 ft^2/ac = - 13 ac

1b. Shoreline loss at TY 20 (northern/northwestern):
(16,000 ft x 22 ft/yr x 20 yr)/43560 ft^2/ac = - 162 ac

2. Interior marsh loss at TY 20:
(361 ac. x 0.00999) x 20 yr. = - 72 ac.
[where 361 ac. = 3536 ac. - 175 ac. lost to erosion]

Total for Sweet Lake = - 247 ac.

WETLAND VALUE ASSESSMENT COMMUNITY MODEL

MULTIPLE AREA BENEFITS SUMMARY SHEET

Project: CS–11b Sweet Lake/Willow Lake Shore Protection

The WVA for project CS–11b included 2 areas: Area 1, consisting of fresh wetlands immediately adjacent to Sweet Lake and Willow Lake; and Area 2, consisting of fresh interior wetlands where terraces are to be constructed. Each area is believed to benefit somewhat differently from project implementation. Total benefits (AAHU's) for this project were calculated by totalling the benefits for each area.

Area	AAHU's
1	192.51
2	68.89

TOTAL BENEFITS = 261 AAHU'S

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project.....CS–11b Sweet/Willow Lake Shore Protection
Area I
Condition: Future Without Project

Marsh type acres:
Fresh..... 4196
Intermediate..

Variable		TY 0 Value	TY 0 SI	TY 1 Value	TY 1 SI	TY 10 Value	TY 10 SI
V1	% Emergent	22	0.30	21	0.29	18	0.26
V2	% Aquatic	15	0.24	15	0.24	10	0.19
V3	Interspersion	%		%		%	
	Class 1		0.20		0.20		0.20
	Class 2						
	Class 3						
	Class 4	100		100		100	
	Class 5						
V4	%OW <= 1.5ft	10	0.21	10	0.21	9	0.20
V5	Salinity (ppt)						
	fresh	0	1.00	0	1.00	0	1.00
	intermediate						
V6	Access Value	1.00	1.00	1.00	1.00	1.00	1.00
		HSI =	0.35	HSI =	0.35	HSI =	0.32

Project.....CS–11b Sweet/Willow Lake Shore Protection
FWOP

Variable		TY 20 Value	TY 20 SI	Value	SI	Value	SI
V1	% Emergent	13	0.22				
V2	% Aquatic	7	0.16				
V3	Interspersion	%		%		%	
	Class 1		0.20				
	Class 2						
	Class 3						
	Class 4	100					
	Class 5						
V4	%OW <= 1.5ft	5	0.16				
V5	Salinity (ppt)						
	fresh	0	1.00				
	intermediate						
V6	Access Value	1.00	1.00				
		HSI =	0.29	HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project.....CS–11b Sweet/Willow Lake Shore Protection
Area I
Condition: Future With Project

Marsh type acres:
Fresh..... 4196
Intermediate..

Variable		TY 0		TY 1		TY 10	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	22	0.30	22	0.30	19	0.27
V2	% Aquatic	15	0.24	18	0.26	30	0.37
V3	Interspersion	%		%		%	
	Class 1		0.20		0.20		0.20
	Class 2						
	Class 3						
	Class 4	100		100		100	
	Class 5						
V4	%OW <= 1.5ft	10	0.21	10	0.21	10	0.21
V5	Salinity (ppt)						
	fresh	0	1.00	0	1.00	0	1.00
	intermediate						
V6	Access Value	1.00	1.00	1.00	1.00	1.00	1.00
		HSI =	0.35	HSI =	0.36	HSI =	0.37

Project.....CS–11b Sweet/Willow Lake Shore Protection
FWP

Variable		TY 20					
		Value	SI	Value	SI	Value	SI
V1	% Emergent	18	0.26				
V2	% Aquatic	34	0.41				
V3	Interspersion	%		%		%	
	Class 1		0.20				
	Class 2						
	Class 3						
	Class 4	100					
	Class 5						
V4	%OW <= 1.5ft	11	0.22				
V5	Salinity (ppt)						
	fresh	0	1.00				
	intermediate						
V6	Access Value	1.00	1.00				
		HSI =	0.37	HSI =		HSI =	

AAHU CALCULATION

Project: CS–11b Sweet/Willow Lake Shore Protection
Area I

Future Without Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	4196	0.35	1480.16	
1	4196	0.35	1459.98	1470.07
10	4196	0.32	1343.86	12617.28
20	4196	0.29	1196.02	12699.44
			AAHU's =	1339.34

Future With Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	4196	0.35	1480.16	
1	4196	0.36	1509.47	1494.82
10	4196	0.37	1539.32	13719.59
20	4196	0.37	1545.19	15422.55
			AAHU's	1531.85

NET CHANGE IN AAHU'S DUE TO PROJECT	
A. Future With Project AAHU's =	1531.85
B. Future Without Project AAHU's =	1339.34
Net Change (FWP – FWOP) =	192.51

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project.....CS–11b Sweet/Willow Lake Shore Protection
Area II – Terraces Only
Condition: Future Without Project

Marsh type acres:
Fresh..... 1600
Intermediate..

Variable		TY 0		TY 1		TY 3	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	5	0.15	5	0.15	5	0.15
V2	% Aquatic	60	0.64	60	0.64	60	0.64
V3	Interspersion	%		%		%	
	Class 1		0.20		0.20		0.20
	Class 2						
	Class 3						
	Class 4	100		100		100	
	Class 5						
V4	%OW <= 1.5ft	85	1.00	85	1.00	85	1.00
V5	Salinity (ppt)						
	fresh	0	1.00	0	1.00	0	1.00
	intermediate						
V6	Access Value	1.00	1.00	1.00	1.00	1.00	1.00
		HSI =	0.37	HSI =	0.37	HSI =	0.37

Project.....CS–11b Sweet/Willow Lake Shore Protection
FWOP

Variable		TY 20					
		Value	SI	Value	SI	Value	SI
V1	% Emergent	4	0.14				
V2	% Aquatic	40	0.46				
V3	Interspersion	%		%		%	
	Class 1		0.20				
	Class 2						
	Class 3						
	Class 4	100					
	Class 5						
V4	%OW <= 1.5ft	85	1.00				
V5	Salinity (ppt)						
	fresh	0	1.00				
	intermediate						
V6	Access Value	1.00	1.00				
		HSI =	0.34	HSI =		HSI =	

WETLAND VALUE ASSESSMENT COMMUNITY MODEL
Fresh/Intermediate Marsh

Project.....CS–11b Sweet/Willow Lake Shore Protection
Area II – Terraces Only
Condition: Future With Project

Marsh type acres:
Fresh..... 1600
Intermediate..

Variable		TY 0		TY 1		TY 3	
		Value	SI	Value	SI	Value	SI
V1	% Emergent	5	0.15	5	0.15	6	0.15
V2	% Aquatic	60	0.64	70	0.73	75	0.78
V3	Interspersion	%		%		%	
	Class 1		0.20		0.20		0.20
	Class 2						
	Class 3						
	Class 4	100		100		100	
	Class 5						
V4	%OW <= 1.5ft	85	1.00	85	1.00	85	1.00
V5	Salinity (ppt) fresh intermediate	0	1.00	0	1.00	0	1.00
V6	Access Value	1.00	1.00	1.00	1.00	1.00	1.00
		HSI =	0.37	HSI =	0.37	HSI =	0.38

Project.....CS–11b Sweet/Willow Lake Shore Protection
FWP

Variable		TY 20					
		Value	SI	Value	SI	Value	SI
V1	% Emergent	9	0.18				
V2	% Aquatic	90	0.91				
V3	Interspersion	%		%		%	
	Class 1		0.24				
	Class 2						
	Class 3	20					
	Class 4	80					
	Class 5						
V4	%OW <= 1.5ft	85	1.00				
V5	Salinity (ppt) fresh intermediate	0	1.00				
V6	Access Value	1.00	1.00				
		HSI =	0.42	HSI =		HSI =	

AAHU CALCULATION

Project: CS–11b Sweet/Willow Lake Shore Protection
Area II – Terraces Only

Future Without Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	1600	0.37	584.48	
1	1600	0.37	584.48	584.48
3	1600	0.37	584.48	1168.96
20	1600	0.34	546.38	9612.25
			AAHU's =	568.28

Future With Project			Total	Cummulative
TY	Acres	x HSI	HU's	HU's
0	1600	0.37	584.48	
1	1600	0.37	595.54	590.01
3	1600	0.38	614.01	1209.55
20	1600	0.42	673.51	10943.98
			AAHU's	637.18

NET CHANGE IN AAHU'S DUE TO PROJECT	
A. Future With Project AAHU's =	637.18
B. Future Without Project AAHU's =	568.28
Net Change (FWP – FWOP) =	68.89