

ME-21 - Grand Lake Shoreline Protection

CWPPRA Grand Lake Shoreline Protection Project (ME-21) Phase II Request

Technical Committee Meeting



U.S. Army
Corps of Engineers
New Orleans
District

December 6, 2006
Baton Rouge, LA



Project Overview

Project Location: Region 4, Mermentau Basin, Cameron Parish, south shore of Grand Lake.

Problem: Shoreline erosion rates in this area vary from 11 to 32 feet per year according to a comparison of aerial photography from 1978/1979 and 1997/1998.

Goals:

1. Stop shoreline erosion from Superior Canal to Tebo Point.
2. Promote accretion between the breakwater and the shore.

Project Map



Project Features Overview

- ◆ Construct rock dike along 37,800 lf of shoreline from Superior Canal to the mouth of Catfish Lake with a separable option to place 5,700 feet additional lf around Tebo Point, to the west of the base project footprint.
- ◆ The rock dike would be situated along the -1.0-ft NAVD 88 contour in 2.0 ft to 3.0 ft of water. The crown would be constructed to elevation +3.0 NAVD88 and 4.0 ft. width. Front and back side-slopes of 1.0 ft vertical on 1.5 ft horizontal.



Project Benefits & Costs

- Project with Tebo Point extension:
Benefits – 540 net acres
Total fully funded cost - \$24,117,374.
Prioritization Score – 61.25
- Project without Tebo Point extension:
Benefits – 495 net acres
Total fully funded cost - \$21,737,859.
Prioritization Score – 61.25

Additional Project Benefits

An additional 90 acres of marsh would be created behind the rock dike from beneficial use of floatation channel dredge material. These acres are not included in the reported net benefit acres for the project.



Project Comparison

Item	Current with TP	Original	Difference
Length:	43,500 LF	39,000 LF	+4,500 LF
Benefits:	540 net acres	495 net ac	+45 net ac
FF Cost:	\$24.1 m	\$13.6 m	+\$10.5 m
Cost/LF:	\$554	\$349	\$205
Cost/ac:	\$44,630	\$27,475	\$17,155
Item	Current w/out TP	Original	Difference
Length:	37,800 LF	39,000 LF	+1,200 LF
Benefits:	495 net acres	495 net ac	0 net ac
FF Cost:	\$21.7 m	\$13.6 m	+\$8.1 m
Cost/LF:	\$574	\$349	\$225
Cost/ac:	\$43,838	\$27,475	\$16,363

Why Fund This Project Now?

- The shoreline is eroding an average 25 ft/yr
- Project ranks 2nd highest out of 12 prioritized projects .
- Land loss in Region IV (164 mi²) resulting from Hurricane Rita was more than 4.6 times the land loss in Region III resulting from Hurricane Rita, and 8.6 times the land loss in Region I (19 mi²) and 2 times the land loss in Region II (77 mi²) resulting from Hurricane Katrina.
- This is the only full project up for consideration in Region IV this funding cycle, Region IV, which has been neglected in the LCA – near term plan.
- No projects were funded for construction last year in Region IV



Questions?



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

November 22, 2006

CEMVN-PM-C (1110-2-1150a)

MEMORANDUM FOR: Mr. Troy Constance, Chair, CWPPRA Technical Committee

SUBJECT: Phase II Authorization Request for the Grand Lake Shoreline Protection Project (ME-21), Cameron Parish, LA

The U.S. Army Corps of Engineers (USACE) and Louisiana Department of Natural Resources (LDNR) request Phase II authorization for the Grand Lake Shoreline Protection Project (ME-21).

The project was authorized for Phase I as a part of Priority Project List 11 (PPL 11) on January 16, 2002 by the Louisiana Coastal Wetlands Conservation and Restoration Task Force (Task Force) under the authority of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). This request is submitted in accordance with the CWPPRA Project Standard Operating Procedures (SOP) Manual.

1. Description of Phase I Project: A description of the Grand Lake Shoreline Protection candidate project as selected for Phase I authorization is found in Enclosure 1. Enclosure 1 contains the original Fact Sheet and map depicting the project boundary and project features. It includes a description of the conceptual features, a summary of the benefits, and budget information as estimated for the project at the time of Phase I authorization.

2. Overview of Phase I Tasks, Process and Issues: After receiving Phase I approval on January 16, 2002, the project delivery team (PDT) was assembled with representatives from the USACE and the LDNR. The PDT developed and submitted a work plan to accomplish Phase I activities to the P&E Subcommittee for their review. The PDT also conducted a kickoff meeting and site visit on June 26-27, 2002. Contracts were awarded to conduct hydrographic surveys, magnetometer surveys, and borings. The USACE Engineering Division performed the engineering and design for the project. The project design considered an option to extend the project alignment around Tebo Point an additional 5,700 linear feet. A 30% design review meeting was held on May 11, 2004, which resulted in a letter from the LDNR concurring to proceed with final design. DNR concurred that the project should proceed with the extension contingent on an assessment of a cultural resources site near Tebo Point. All NEPA documentation was completed resulting in a final Environmental Assessment and a Finding of No Significant Impact (FONSI) dated 2 April 2004, with a supplemental EA issued for the 5,700 linear foot Tebo Point extension. The Plans and Specifications were prepared and the Design Report finalized. The USACE Real Estate Division completed the official Real Estate Plan, which defines the real estate requirements in Phase II. The LDNR prepared the Ecological Review. A 95% Design Review Meeting was held on August 16, 2004. The Final Design Report including all supporting appendices was provided for the 95% Design Review Meeting.

3. Description of the Phase II Candidate Project:

A. A description of the Grand Lake Shoreline Protection Phase II candidate project is found in Enclosure 3-A. Enclosure 3-A contains the current Fact Sheet and map depicting the project boundary and project features. It includes a detailed description of the features of the project, a summary of the benefits and project budget information.

B. The originally approved Grand Lake Shoreline Protection project started at Superior Canal and terminated at the beginning of Tebo Point. As a result of the Phase I analyses, the USACE and LDNR concluded that it would be beneficial to extend the project to include all of Tebo Point within the project design. This extension increased the rock dike length by approximately 5,700 lf (15.1%), the benefits by 45 net acres (+9.1%), and the total fully funded cost by \$2,379,515 (+10.9%).

C. A table comparing the project at the time of Phase I approval and the current project has been included as enclosure 3-C.

4. Checklist of Phase II requirements:

A. List of Project Goals and Strategies.

Goal #1: To stop shoreline erosion from Superior Canal to Tebo Point.

Goal #2: To promote accretion between the breakwater and the shore.

Coast 2050 Strategy: Regional #16 - Stabilize Grand and White Lakes' shorelines.

B. Since the Cost Sharing Agreement (CSA) between the USACE and the LDNR covers both Phase I and Phase II, it cannot be executed until the project is approved for Phase II funding and construction. A cost share agreement will be executed shortly after receiving Phase II approval and would not impact the construction schedule.

C. The USACE will finalize landrights in a short period of time after Phase II approval.

D. The USACE and the LDNR conducted a favorable 30% Design Review Meeting on May 11, 2004. As a part of that review, the Preliminary Design Report was provided for agency review and comment. The Preliminary Design Report included the results of the surveys, borings, geotechnical investigations, data analysis review, and the preliminary designs. The LDNR sent a letter dated May 12, 2004 indicating their concurrence to proceed with the final design of the project. A copy of the letter of concurrence has been included as enclosure 4-D.

E. The USACE and the LDNR conducted a favorable 95% Design Review Meeting on August 16, 2004. As a part of that review, the Project plans and specifications and the Final Design Report were provided for agency review and comment. The LDNR sent a letter dated August 30, 2004 that indicated their concurrence to proceed with the Phase II request for the project. A copy of the letter of concurrence has been included as enclosure 4-E.

F. The Environmental Assessment (EA) for the project was finalized and a copy of the signed FONSI, dated 2 April 2004, has been included as enclosure 4-F. A supplemental EA and FONSI, dated 1 March 2005, for the Tebo Point extension is also included.

G. A copy of the Ecological Review completed by the LDNR has been included as enclosure 4-G.

H. All permits and authorizations, including Water Quality Certificate, dated 23 January 2004, Coastal Zone Consistency, dated 11 March 2004. All Fish and Wildlife Coordination Act and Essential Fish Habitat requirements have been met and the LA State Historic Preservation Officer has concurred with a determination of no effect on historic properties.

I. The hazardous, toxic and radiological waste (HTRW) assessment was addressed in the EA.

J. A copy of the signed Section 303(e) approval from the USACE has been included as enclosure 4-J.

K. A copy of the Overgrazing determination from the Natural Resources Conservation Service (NRCS) has been included as enclosure 4-K. The letter indicates that there is no problem with overgrazing within the project area.

L. A current revised fully-funded cost estimate of Phase II activities or economic analyses, based on the current Project design has been included as enclosure 4-L and summarized directly below.

Funding/Budget information:

1) Specific Phase II funding request (construction and three years of O&M):

Grand Lake SP with Tebo Point extension: \$20,331,946

Grand Lake SP without extension: \$17,980,307

2) Fully-funded 20-year cost estimates:

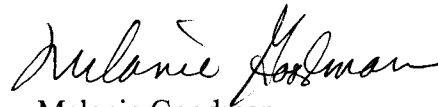
Grand Lake SP with Tebo Point extension: \$24,117,374

Grand Lake SP without extension: \$21,737,859

M. A revised Wetland Value Assessment (WVA) was not required for the original project limits because there was not a change in scope as defined by the CWPPRA SOP. A WVA for the Tebo Point extension option was prepared and reviewed by the Environmental Workgroup. The resulting benefits have been included in enclosure 3-A in the benefits write-up.

N. A summary of the Prioritization Criteria ranking score, finalized and agreed upon by all agencies prior to the 95% design review and updated with the current fully-funded cost estimate as of November 20, 2006 has been included as enclosure 4-N.

If you have any questions regarding the subject project, please call Ms. Melanie Goodman at (504) 862-1940.

A handwritten signature in black ink, appearing to read "Melanie Goodman". The signature is fluid and cursive, with the first name "Melanie" written in a larger, more prominent script than the last name "Goodman".

Melanie Goodman
Project Manager
Restoration Office

Enclosures

Enclosure 1

Phase 1 Fact Sheet

PPL11 FINAL PROJECT NOMINEE FACT SHEET

Nov 20, 01 pl11NovFS Grand Lake

ME-16-2 Grand Lake Shoreline Protection, from Superior Canal to Tebo Point

Coast 2050 Strategy - Regional #16 - Stabilize Grand and White Lakes shorelines.

Project Location - Region 4, Mermentau Basin, Cameron Parish, south shore of Grand Lake.

Problem -According to a comparison of the 1978-79 aerial photography with 1997-98 photography, shoreline erosion rates in this area vary from 11 to 32 feet per year.

Goals – 1) stop shoreline erosion from Superior Canal to Tebo Point. 2) promote accretion between the breakwater and the shore.

Proposed Solution - Approximately 39,000 feet of stone breakwater will be built in Grand Lake at the outer edge of the –2 foot contour from Superior Canal to Tebo Point. The crest elevation will be +2.0 feet NGVD; crest width 4 feet; front and back slopes 1:3; and stone size 650# maximum. Approximately 163,000 tons of riprap will be used. The stone will be placed on geotextile fabric that is 200 lb/inch. Gaps for fish access will be built every 1,000 feet. They will have a top width of 46 feet and extend to the lake bottom. They will be lined with a concrete apron. A flotation channel will be at least 35 feet from the centerline of the dike with a side slope of 1:4 and a depth of –6 feet. Material from the flotation canal will be cast inside the breakwater.

Project Benefits – The project would benefit 445 acres of fresh marsh and 717 acres of open water (total 1,162 acres). Shoreline loss would be prevented and some marsh would accrete south of the breakwater so at the end of 20 years, 495 acres of marsh would be protected/created.

Preliminary Costs – The total fully funded cost is \$13,562,500. The fully funded first cost is \$9,559,700.

Risk/Uncertainty and Longevity/Sustainability – There will be a low degree of risk associated with this project because monitoring has indicated that breakwaters significantly reduce erosion. The project should continue providing benefits more than 20 years after construction because some rocks will be replaced at years 5 and 15.

Sponsoring Agency and contact Persons – Corps of Engineers

Sue Hawes, COE, 504 862-2518 suzanne.r.hawes@mvn02.usace.army.mil

Christopher Alfonso, 504 862-2401 christopher.d.alfonso@mvn02.usace.army.mil



0.5 0 0.5 Miles

0.5 0 0.5 1 1.5 Kilometers



Project area



Proposed Breakwater

Data Source:
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

LA Department of Natural Resources
Coastal Restoration Division

Map Date: November 16, 2001
Map ID: 200204142

Image Data:
1990 SPOT Panchromatic Imagery

CWPPRA PPL11
Region 4

Grand Lake Shoreline Protection
Superior Canal to Tebo Point
(ME-16-2)

Enclosure 3-A

Final Fact Sheet

FINAL PROJECT FACT SHEET

November 29, 2006

Project Name: Grand Lake Shoreline Protection, ME-21

Coast 2050 Strategy: Regional #16 - Stabilize Grand and White Lakes shorelines.

Project Location: Region 4, Mermentau Basin, Cameron Parish, south shore of Grand Lake.

Problem: According to a comparison of the 1978-79 aerial photography with 1997-98 photography, shoreline erosion rates in this area vary from 11 to 32 feet per year.

Goals: 1) stop shoreline erosion from Superior Canal to Tebo Point. 2) promote accretion between the breakwater and the shore.

Proposed Solution: The final design consists of constructing approximately 37,800 linear feet of rock dike stretching from Superior Canal to the mouth of Catfish Lake with an option to place up to an additional 5,700 feet of dike to the west of the base project footprint (option reach). The Technical Committee and Task Force will be given the option to fund the increased length. This fact sheet covers both funding alternatives up for consideration. The rock dike will be situated along the -1.0-ft NAVD 88 contour in approximately 2.0 feet to 3.0 feet of water, stage dependant. The dike crown will be constructed to an elevation of +3.0 NAVD88 (+/-0.25') and have a width of approximately 4.0 feet. The dike will have front and back side-slopes of 1.0-foot vertical on 1.5-foot horizontal. It will be constructed by placing 650# maximum stone on a layer of geotextile fabric. Gaps for fish access will be built at approximate 1,000-foot intervals. A flotation channel will be dredged parallel to and lake-ward of the rock dike, no closer than 45 feet from the centerline of the dike. The maximum allowable dredging depth for the flotation channel is -5.5 feet NAVD 88. All material from the flotation channel will be cast inside of the rock dike.

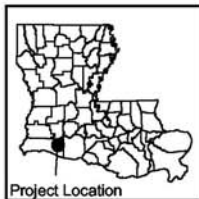
Project Benefits: The 37,800 lf of rock dike will benefit 445 acres of existing fresh marsh and 717 acres of open water (total 1,162 acres). Shoreline loss will be prevented and some marsh will accrete south of the breakwater so at the end of 20 years, 495 acres of marsh will be protected/created. The proposed extension around Tebo Point will benefit an additional 45 acres of fresh marsh and an additional 32 acres of open water. At the end of 20 years, an additional 45 acres will be protected/created.

Estimated Fully Funded Costs: The total fully funded cost of the project including the Tebo Point option is \$24,117,374. The total fully funded cost of the base reach is \$21,737,859.

Risk/Uncertainty and Longevity/Sustainability: There will be a low degree of risk associated with this project because monitoring has indicated that breakwaters significantly reduce erosion. The project should continue providing benefits more than 20 years after construction because there is a scheduled maintenance event in year 3 and year 15.

Sponsoring Agency and Contact Persons:

Melanie Goodman, USACE PM, 504-862-1940, Melanie.L.Goodman@mvn02.usace.army.mil
Kenneth Duffy, LDNR PM, 225-342-4106, kend@dnr.state.la.us



0.5 0 0.5 1 1.5 Miles

0.5 0 0.5 1 1.5 Kilometers

Map Source:
US Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Baton Rouge, Louisiana

Image Source:
2002 Thematic Mapper Satellite Imagery
January 8, 2002

Map Date: July 29, 2004
Map ID: USGS-NWRC 2004-11-0462

Grand Lake Shoreline Protection Superior Canal to Tebo Point (ME-21)

- Proposed Rock Dike
- Project Boundary

Enclosure 3-C

Description of Changes
From Phase I Approval

Description of Changes From Phase I Approval

There are no changes to project scope from Phase I approval. An option to extend the original project is also up for consideration by the Technical Committee and Task Force.

Comparison to Current Project without extension:

Description	Project Info at the time of Phase 0 approval (PPL 11)	Project Info Currently (without Tebo Pt option)	Difference
Length:	~39,000 lf	37,800 lf	slightly different bc based on actual dike alignment
Placement Location:	@ -2' NGVD contour	@ -1.0' NAVD 88 contour	similar, just difference in datums.
Crest El.:	+2.0' NGVD	+3.0' NAVD88	similar, just difference in datums.
Crest Width:	4 ft	4 ft	
Side Slopes:	1V:3H	1V:1.5H	revised based on geotech info
Stone Size:	650# max	650# max	
Fish Dip Spaces:	every 1,000 lf	every 1,000 lf	
Project Benefits:	495 net acres	495 net acres	No change
Total Fully Funded Cost:	\$13,562,500	\$21,737,859	60.3%

Comparison to Current Project with Tebo Point extension:

Description	Project Info at the time of Phase 0 approval (PPL 11)	Project Info Currently (with Tebo Pt option)	Difference
Length:	~39,000 lf	43,500 lf	Increase of 4,500 lf
Placement Location:	@ -2' NGVD contour	@ -1.0' NAVD 88 contour	similar, just difference in datums.
Crest El.:	+2.0' NGVD	+3.0' NAVD88	similar, just difference in datums.
Crest Width:	4 ft	4 ft	
Side Slopes:	1V:3H	1V:1.5H	revised based on geotech info
Stone Size:	650# max	650# max	
Fish Dip Spaces:	every 1,000 lf	every 1,000 lf	
Project Benefits:	495 net acres	540 net acres	45 net acres more 9.09%
Total Fully Funded Cost:	\$13,562,500	\$24,117,374	77.8%

Enclosure 4-D

30% Design Review Letter

State of Louisiana



KATHLEEN BABINEAUX BLANCO
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL RESTORATION AND MANAGEMENT
May 12, 2004

Colonel Peter J. Rowan
District Engineer
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: 30% Design Review for Grand Lake Shoreline Protection (ME-21)
Statement of Local Sponsor Concurrence

Dear Col. Rowan:

The 30% design review meeting was held on May 11, 2004 for the Grand Lake Shoreline Protection (ME-21) project. Based on our review of the technical information compiled to date, the ecological review, the preliminary land ownership investigation, and the preliminary designs, we, as local sponsor, concur to proceeding with the design of the project, with the understanding that the two increments above baseline, Options A and B, will be contingent on an assessment of the cultural resources site near Tebo Point. Since no oyster leases will be affected by this project, there has been no assessment of potential impacts.

In accordance with the CWPPRA Project Standard Operating Procedures Manual, we request that you forward this letter of concurrence along with the revised project cost estimate to the Technical Committee and the Planning and Evaluation Subcommittee. We also request that our project manager, Ken Duffy, be copied on this and other correspondence concerning this project.

Please do not hesitate to call if I may be of any assistance.

Sincerely,

Handwritten signature of Christopher P. Knotts in black ink.

Christopher P. Knotts, P.E.
Director

cc: David Burkholder, Engineer Manager
Luke Le Bas, Engineer Manager
Ken Duffy, Project Manager

COASTAL ENGINEERING DIVISION
P. O. BOX 44027 • BATON ROUGE, LA 70804-4027 • 617 N. THIRD STREET • 10TH FLOOR • BATON ROUGE, LA 70802
PHONE (225) 342-7308 • FAX (225) 342-9417 • WEB <http://www.dnr.state.la.us>
AN EQUAL OPPORTUNITY EMPLOYER

Enclosure 4-E

95% Design Review Letter

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR



SCOTT A. ANGELLE
SECRETARY

DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL RESTORATION AND MANAGEMENT

August 30, 2004

Mr. John Saia
Deputy District Engineer for Project Management
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: 95% Design Review for Grand Lake Shoreline Protection (ME-21)
Statement of Successful Completion

Dear Mr. Saia:

The 95% design review meeting was successfully completed on August 16, 2004 for the Grand Lake Shoreline Protection (ME-21) project. Based on our review of the Final Design Report, plans and specifications, the Ecological Review, and the environmental compliance documentation, as local sponsor, we concur to request permission from the Technical Committee to proceed to Phase II for this project.

In accordance with the CWPPRA Project Standard Operating Procedures Manual, we request that you forward the items required in Appendix C -- Information Required in Phase II Authorization Requests to the CWPPRA Technical Committee for subsequent approval by the CWPPRA Task Force. We also request that our project manager, Kenneth Duffy, be copied on this and all other correspondence concerning this project.

Please do not hesitate to call if I may be of any assistance.

Sincerely,

Handwritten signature of Christopher P. Knotts in black ink.

Christopher P. Knotts, P.E.
Director

CPK:KCD:kcd

cc: John Hodnett, P.E., Engineer Manager
Luke LeBas, P.E., Engineer Manager
Kenneth Duffy, Ph.D., Project Manager
Amanda Phillips, P.E., Project Engineer

Enclosure 4-F

EA # 380
SEA #380 A



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Grand Lake Shoreline Protection Project
Cameron Parish, Louisiana
EA # 380

Description of Proposed Action. The proposed action consists of building approximately 39,000 feet of stone breakwater along the south shore of Grand Lake in Cameron Parish, Louisiana. The breakwater will stretch westward from Superior Canal to the mouth of Catfish Lake, ending approximately 1,600 feet east of Tebo Point. This breakwater would be built at the outer edge of the 2-foot depth contour (estimated -1.2 ft North American Vertical Datum 1988 [NAVD 88] equivalent). Dimensions of the breakwater would be a crest elevation of +3.5 feet NAVD 88, a 4-foot crest width, and 1:5 front and back slopes. Stone size for the breakwater would be 650 pounds maximum (largest stones would be approximately 24 inches in diameter), and the dike would require approximately 185,000 tons of stones. The stones would be placed on geotextile separator fabric with a tensile strength of 3,600 pounds per linear foot. Gaps for fish access would be built approximately every 1,000 feet, would have a top width of 50 feet, and would extend to the lake bottom, with an approximate bottom width of 36 feet. A flotation channel for equipment access would be at least 45 feet from the centerline of the dike with side slopes of 1:2 and a depth of 5 feet. Material from the flotation canal would be cast inside the breakwater where feasible. Additional access dredging is likely to be required in the vicinity of the project site in order to allow rock transport from the Mermentau River to the project site. Controlling water depth would be 5 feet. Dredged material would be stockpiled adjacent to the required dredging location during construction, then returned to its pre-project location upon project completion. Shoreline loss would be prevented and some marsh would accrete south of the breakwater so at the end of 20 years, 495 acres of marsh would be protected and/or created.

Factors Considered in Determination. This office has assessed the impacts of the proposed action on significant resources, including Grand Lake, wetlands, fisheries, wildlife, essential fish habitat, endangered or threatened species, cultural resources, recreational resources, aesthetics, and air quality. No significant adverse impacts were identified for any of the significant resources. The risk of encountering HTRW is low. By a letter dated 7 May 2003, the U.S. Fish and Wildlife Service confirmed that the proposed action is not likely to adversely affect any endangered or threatened species. In a letter, dated 11 March 2004, the Louisiana Department of Natural Resources concurred with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program (Coastal Zone Consistency #C20040024).

A Water Quality Certificate, (#030801-08 / AI 117263 / CER20030001) dated 23 January 2004 was received from the Louisiana Department of Environmental Quality. Review of the Section 404(b)(1) Public Notice was completed on 7 November 2003. The Section 404(b)(1) Evaluation was signed on 30 October 2003. In a letter dated 3 March 2004, the Louisiana State Historic Preservation Officer concurred with a recommendation of no effect on historic properties. This office has concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a letter from the U.S. Fish and Wildlife Service, dated 13 February 2004. This office has concurred with, or resolved, all Essential Fish Habitat recommendations contained in a letter from NOAA Fisheries, dated 11 March 2004.

Environmental Design Commitments. No impacts have been identified that would require compensatory mitigation. The following commitments are an integral part of the proposed action:

1.) If the proposed action is changed significantly or is not implemented within one year, CEMVN will reinitiate coordination with the USFWS to ensure that the proposed action would not adversely affect any Federally listed threatened or endangered species, or their habitat. (USFWS CAR letter dated 13 February 2004)

2.) CEMVN is aware of cultural site 16CM33 on Tebo Point. As the Proposed Action will stop at the mouth of Catfish Lake, approximately 1,600 feet east of Tebo Point, the project should have no effect on this resource. If, during construction, evidence is found that portions of site 16CM33 is located within construction areas, then all construction in the affected areas must cease until an CEMVN-PM-RN archaeologist is notified and appropriate actions can be determined. Furthermore, if in the future, the breakwater would be extended around Tebo Point, then a supplemental EA, including further study of cultural resources, will be required. If any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN-PM-RN archeologist has been notified and final coordination with the SHPO and THPO has been completed. (SHPO coordination letter dated 3 March 2004)

3.) Approximately 32 acres of muddy and non-vegetated bottom, would be lost under the footprint of the breakwater; however, the stabilization and creation of approximately 495 acres (or 149 Average Annual Habitat Units) of more desirable freshwater marsh which provides important nursery habitat (essential fish habitat) would make up for this loss. (NOAA Fisheries coordination letter dated 9 February 2004)

Public Involvement. The proposed action has been coordinated with appropriate Federal, state, and local agencies and businesses, organizations, and individuals through distribution of Environmental Assessment # 380 (EA #380) for their review and comment.

Conclusion. This office has assessed the potential environmental impacts of the proposed action. Based on this assessment, and a review of the public comments made on EA #380 a determination has been made that the proposed action would have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not be prepared.

Date

2 Apr 04


 Peter J. Rowan
 Colonel, U.S. Army
 District Engineer



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

TEBO POINT SEGMENT GRAND LAKE SHORELINE PROTECTION PROJECT

CAMERON PARISH, LOUISIANA

SEA #380A

Description of Proposed Action. The U.S. Army Corps of Engineers, New Orleans District, proposes to continue the construction of a rock breakwater for approximately 5,700 feet, along the southern shore of Grand Lake from Catfish Lake around Tebo Point. The breakwater would be built at the outer edge of the -2 foot depth contour [estimated -1.2 ft North American Vertical Datum 1988 (NAVD 88) equivalent]. The crest would be +3.5 feet NAVD 88 elevation, and would have a 4-foot top width. The side slopes of the breakwater would be 1:1.5. The project would require approximately 18,000 tons of stones, with the largest stones being approximately 24-inches in diameter. The stones would be placed on geotextile fabric that is rated to 350 pounds per square inch. Gaps for fish access would be built approximately every 1,000 feet, would have a top width of 50 feet, and would extend to the lake bottom. Bottom width of the fish breaks would be approximately 36 feet, based on the 1:1.5 side slopes. A flotation channel would be at least 45 feet from the centerline of the breakwater with side slopes of 1:2. Maximum dredging depths would be limited to an elevation no lower than -5.5 feet NAVD 88. Material from the flotation canal would be cast inside the breakwater where feasible. Additional access dredging is likely to be required in the vicinity of the project site in order to allow stone transport from the Gulf Intracoastal Waterway and/or the Mermentau River to the project site. Controlling water depth would be -5.5 feet and materials would be stockpiled adjacent to the required dredge location during construction then returned to its pre-project location upon project completion. Shoreline loss would be prevented and some marsh would accrete south of the breakwater so at the end of 20 years, approximately 45 acres of marsh would be protected and/or created.

Factors Considered in Determination. This office has assessed the impacts of the proposed action on significant resources, including Grand Lake, wetlands, fisheries, wildlife, essential fish habitat, threatened or endangered species, cultural resources, recreation, and air quality. No significant adverse impacts were identified for any of the significant resources. The risk of encountering HTRW is low. No impacts were identified that would require compensatory mitigation. By letters dated September 15, 2004 and December 21, 2004, respectively, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service confirmed that the proposed

action is not likely to adversely affect any endangered or threatened species. In a letter dated February 22, 2005, the Louisiana Department of Natural Resources concurred with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program (Coastal Zone Consistency #C20040024 as amended). A Water Quality Certificate (#30801-08 as amended), dated February 23, 2005 was received from the Louisiana Department of Environmental Quality. The Section 404(b)(1) evaluation was amended on October 21, 2004. In a letter dated February 11, 2005, the Louisiana State Historic Preservation Officer concurred with a recommendation of no effect on historic properties. This office has concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a letter from the U.S. Fish and Wildlife Service, dated January 13, 2005. This office has concurred with, or resolved, all comments on the air quality impact analysis documented in the EA, which were contained in a letter from Louisiana Department of Environmental Quality, dated December 29, 2004. This office has concurred with, or resolved, all Essential Fish Habitat recommendations contained in a letter from the National Marine Fisheries Service, dated December 22, 2004.

Environmental Design Commitments. The following commitments are an integral part of the proposed action

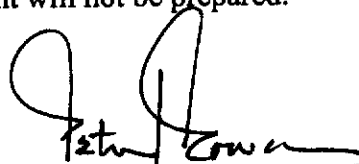
- 1.) If the proposed action is changed significantly or is not implemented within one year, CEMVN will reinitiate coordination with the USFWS to ensure that the proposed action would not adversely affect any Federally listed threatened or endangered species, or their habitat. (USFWS letter dated January 13, 2005.)
- 2.) If, during construction, evidence is found that a portion of site 16CM33 is located within the construction area or if any unrecorded cultural resources are determined to exist within the proposed project boundaries, then all construction in the affected areas must cease until a CEMVN archaeologist is notified and final coordination with the SHPO and THPO has been completed. [CEMVN-PM-RN/SHPO Standard Operating Procedure]

Public Involvement. The proposed action has been coordinated with appropriate Federal, state, and local agencies and businesses, organizations, and individuals through distribution of Environmental Assessment # 330A (EA #380A) for their review and comment. EA#380A is attached hereto and made a part of this FONSI.

Conclusion. This office has assessed the potential environmental impacts of the proposed action. Based on this assessment, a review of the comments made on EA #380A, and the implementation of the environmental design commitments listed above, a determination has been made that the proposed action would have no significant impact on the human environment. Therefore, an Environmental Impact Statement will not be prepared.

1 MAR 05

 Date



 Peter J. Rowan
 Colonel, U.S. Army
 District Engineer

Enclosure 4-G

Ecological Review

E C O L O G I C A L R E V I E W

Grand Lake Shoreline Protection

CWPPRA Priority Project List 11

(State No. ME-21)

August 31, 2004

Mark A. Stead
Restoration Technology Section
Coastal Restoration Division
Louisiana Department of Natural Resources

Ecological Review Grand Lake Shoreline Protection

In August 2000, the Louisiana Department of Natural Resources (LDNR) initiated the Ecological Review to improve the likelihood of restoration project success. This is a process whereby each restoration project's biotic benefits, goals, and strategies are evaluated prior to granting construction authorization. This evaluation utilizes environmental data and engineering information, as well as applicable scientific literature, to assess whether or not, and to what degree, the proposed project features will cause the desired ecological response.

I. Introduction

The proposed Grand Lake Shoreline Protection (ME-21) project is located in the Mermentau Basin in Cameron Parish, Louisiana. The project area encompasses the southern shore of Grand Lake from Superior Canal to the mouth of Catfish Lake and may include an optional structural increment that extends westward to Tebo Point (Figure 1). The total area of the Grand Lake Shoreline Protection project is approximately 1,162 acres and is primarily composed of fresh emergent marsh (445 acres) and open water (717 acres) habitats (USACE 2001). Approximately 37,800 feet of Grand Lake shoreline will be protected through the construction of a foreshore rock dike, with an option to protect 5,700 feet of shoreline around Tebo Point.

Coast 2050 identified elevated water levels and wave energy generated by strong frontal winds as the major factors contributing to the rapid erosion of the southern shore of Grand Lake [Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority (LCWCRTF&WCRA) 1999]. Erosion rates calculated by comparing aerial photographs from 1978-1979 to those taken in 1997-1998 revealed that 11 to 32 feet of shoreline was lost annually (USACE 2001). Construction of the foreshore rock dike will prevent the lake from breaching into adjacent open water areas (Lake Benoit and Long Lake) and will protect interior marsh, which without the structure, will be subjected to increased wave energy (LCWCRTF&WCRA 1999). The proposed strategy of protecting and stabilizing the southern shoreline of Grand Lake is supported by the *Coast 2050* Region 4 Ecosystem Strategies which promote the stability and protection of bay, lake, and gulf shorelines for the preservation of interior wetlands and the maintenance of favorable hydrologic conditions.

II. Goal Statement

- Stop erosion along approximately 37,800 linear feet of the southern bank of Grand Lake and as a result save 445 acres of interior emergent marsh that is expected to be lost over the 20 year project life.
- Increase submerged aquatic vegetation (SAV) coverage to 80% in the open water areas from a baseline of 10% over the 20 year project life.
- Create 50 acres of emergent marsh between the Grand Lake shoreline and the foreshore rock dike over the 20 year project life.
- Stop erosion along the shoreline of Tebo Point and as a result save 28 acres of emergent marsh that is expected to be lost over the 20 year project (optional goal).

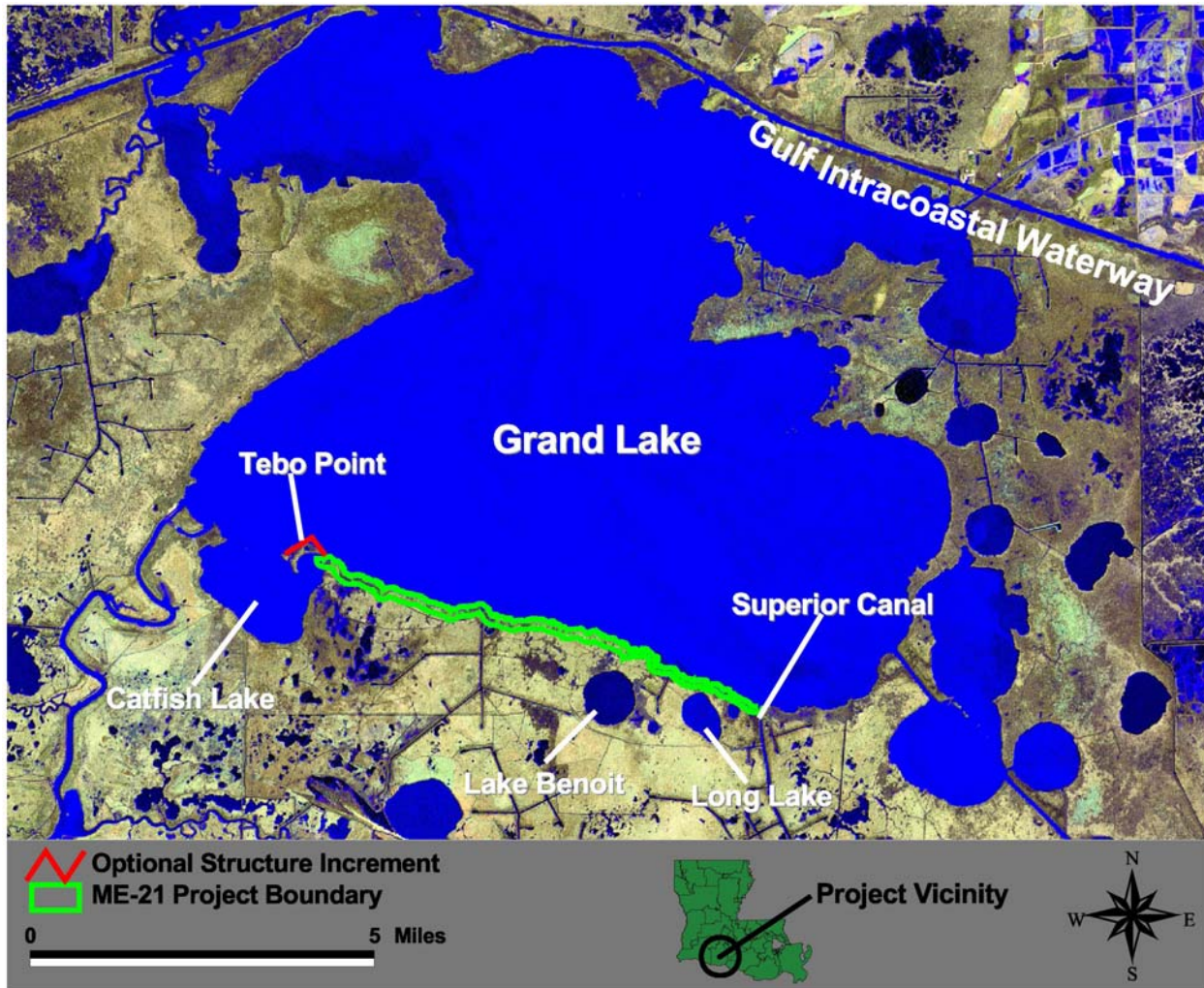


Figure 1. Grand Lake Shoreline Protection project area.

III. Strategy Statement

The project goals will be achieved through the construction of an approximately 37,800 foot foreshore rock dike along the southern shore of Grand Lake from Superior Canal to the mouth of Catfish Lake with the option of including an additional 5,700 feet of structure around Tebo Point.

IV. Strategy-Goal Relationship

The construction of a foreshore rock dike will stop erosion along the southern Grand Lake shoreline by dampening wind generated waves. The stabilization of the lake shoreline will in turn protect interior marsh from being exposed to wave energy. Marsh accretion is expected to occur behind the shoreline protection structure due to the occasional overwash of waves and subsequent deposition of sediment. Additional marsh creation benefits will be achieved through the strategic placement of dredged spoil from the digging of the flotation canals.

The construction of the foreshore rock dike is expected to increase the overall percentage of SAV coverage in the area behind the shoreline protection structure from 10% to 80%. SAV

habitat creation is expected to occur due to the reduction of turbidity in the shallow open water areas and the resulting increase in overall light penetration.

V. Project Feature Evaluation

A 37,800 foot foreshore rock dike will be constructed along the southern shore of Grand Lake 200 feet from the existing shoreline at the -1.0 NAVD-88 foot contour from Superior Canal to the mouth of Catfish Lake. In addition, an optional plan is in place to extend the structure an additional 5,700 feet westward around Tebo Point and continuing southwest to protect the entire island (Figure 1). The crest elevation of the rock dike structure will be built at an approximate height of $+3.0 \pm 0.25$ feet NAVD-88 (Figure 2). Settlement is expected to occur during construction. To offset this initial loss, the contractor will add rock material to the structure as needed to achieve the desired design height before demobilization. The breakwater will have front and back side-slopes of 1(V) on 1.5(H) and a crest width of 4 feet. All stone sizing will conform to standard 24 inch rock gradation placed on 200 pound/inch² geotextile fabric. Fish dips measuring 50 feet wide and lined with a layer of rock will be constructed every 1,000 feet to allow organism egress and ingress.

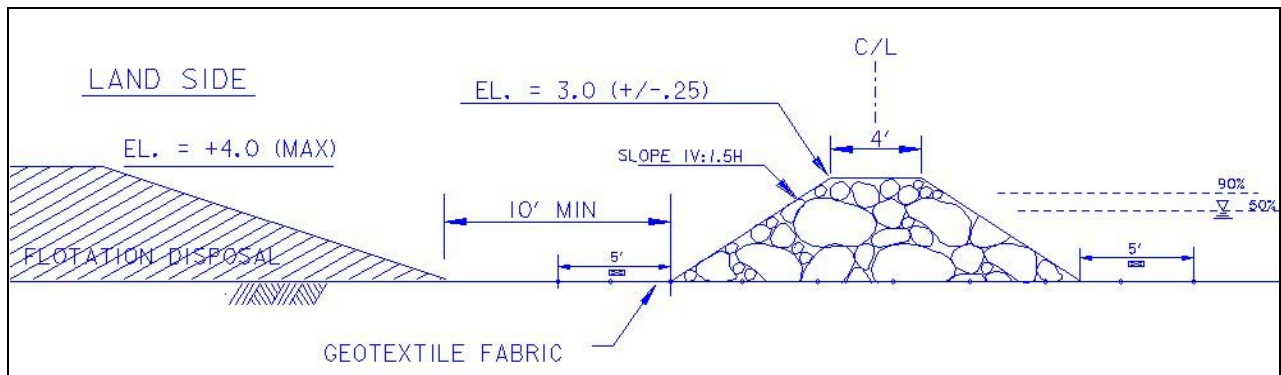


Figure. 2: Typical dike section (USACE 2004).

Originally the crest elevation of the shoreline protection structure for the Grand Lake project was designed at +3.5 feet NAVD-88 which was calculated by adding the following three factors: mean water elevation, 90% wind setup, and 90% wave height. However, protecting against 90% of the wave height was considered a conservative estimation of the conditions in the Grand Lake project area. Project engineers felt that designing the rock dike to protect against $\frac{1}{2}$ of the 90% wave height would reduce the cost and overall pressure on the soil foundation while still providing adequate shoreline protection. As a result, the current structure elevation design of +3.0 feet NAVD-88 was determined through the addition of the Grand Lake mean water level (+1.45 feet), 90% wind setup (0.50 feet), and $\frac{1}{2}$ of the 90% wave height (0.85 feet). This design technique results in 0.2 feet of the rock dike remaining sub-aerial during storm conditions.

The geotechnical analysis (USACE 2003) revealed a relatively poor soil foundation in the project area. The soils near the southern bank of Grand Lake consist of soft and organic clays with occasional lenses of soft clay, silt, silty sand and occasional wood. Pleistocene deposits reside nine feet underneath the upper swampy marsh deposits and consist of interbedded, highly oxidized, stiff clays. The geotechnical analysis indicated that the foundation clays are over consolidated and little consolidation settlement is expected to occur (USACE 2003). After

construction, lateral spreading will cause settlement of approximately 1.76 feet with a second lift expected in three years to maintain a crest elevation of +3.25 NAVD-88. It is estimated that after the three year maintenance lift the structure will ultimately settle to a crest height of +2.56 feet NAVD-88 by year twenty. The initial placement elevation for the Grand-White Lakes Landbridge Protection (ME-19) project, which is in the vicinity of the Grand Lake Shoreline Protection project, was built at an elevation of +2.5 NAVD-88.

According to the settlement consolidation curves, the structure elevation will fall below mean water level (+1.45 feet NAVD-88) two years post-construction, one full year before the scheduled maintenance lift planned for year three (Figure 3). It is conceivable that once submerged the foreshore rock dike will become somewhat less effective as a shoreline protection structure, and a possible threat to navigation. However, project team members determined that the benefits of the shoreline protection structure would not be significantly reduced in view of the fact that the structure would be submerged for a relatively short period of time. In addition, the dredged material placed on the landward side of the rock dike would offer further protection to the Grand Lake shoreline. To avoid possible threats to navigation, the structure will be adequately marked.

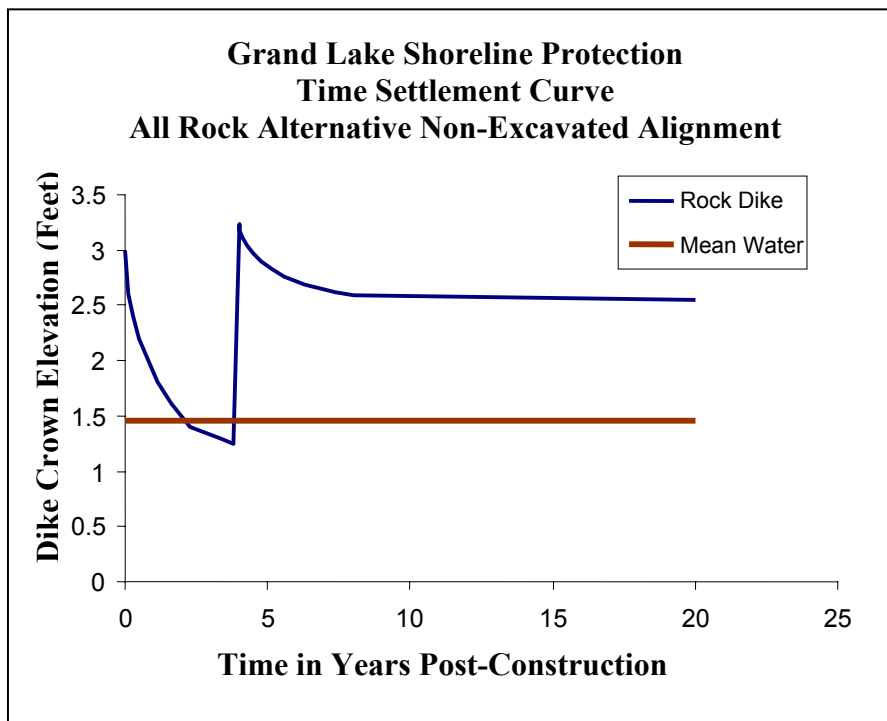


Figure 3. Time settlement curve for proposed Grand Lake foreshore rock dike after construction.

The need for a flotation canal to allow access for construction barges and equipment will produce a significant amount of dredged spoil. It is estimated that approximately 120 acres of fresh emergent marsh will be created through the beneficial use of the dredged material. Maximum allowable dredging depth of the flotation channel will be -5.0 feet NAVD-88. The spoil will be stacked at a target elevation of +3.0 feet NAVD-88 and at a maximum elevation of +4.0 feet NAVD-88. The material will be placed at a minimum of 10 feet landward from the toe

of the foreshore rock dike and 50 feet seaward of the shoreline. It is expected that the dredged spoil, through the dewatering and consolidation process, will settle to a final elevation of +1.5 to +1.9 feet NAVD-88 at year twenty. This elevation is considered optimal for healthy unbroken marsh and is consistent with the surrounding marsh elevation in the Grand Lake project areas (USACE 2004).

A possible cultural resource site (Indian midden mound) exists near the western most edge of Tebo Point. At the 30% Design Review meeting for the Grand Lake Shoreline Protection project, it was believed that dredging a flotation canal near Tebo Point could destroy valuable cultural artifacts. However, a recent United States Army Corps of Engineers archeological survey of the area determined that the footprint of the midden mound at Tebo point was not as large as originally estimated. As a result, the dredging of the flotation canal for placement of the rock material around the shoreline of Tebo Point would not likely endanger any cultural resources. Construction of the rock dike at the shoreline of Tebo Point would likely preserve any cultural resources from erosional forces while providing protection to the western flank of the Grand Lake shoreline (Figure 1). The placement of the shoreline protection structure around Tebo Point is considered optional since the increment was not included in the original project plans or Wetland Value Assessment. The decision to exercise any part of the option will be made by the Contracting Officer of Record, during construction, provided the Coastal Wetlands Conservation and Restoration Task Force approves the project to the maximum length.

VI. Assessment of Goal Attainability

Environmental data and scientific literature documenting the effects of the proposed project features in field application are evaluated below to assess whether or not, and to what degree the project features will the desired ecological response.

Armor Shoreline Protection

A number of projects using traditional shoreline protection structures have been implemented in Louisiana coastal areas to protect lake, bay, and navigational channel shorelines (Table 1). Published results of projects funded under CWPPRA and through the State of Louisiana that have used rock shoreline protection structures constructed in environments similar to the Grand Lake Shoreline Protection project are discussed below.

- The Boston Canal/Vermilion Bay Bank Protection (TV-09) project was designed to abate wind-driven wave erosion along Vermilion Bay and at the mouth of Boston Canal (Thibodeaux 1998). To accomplish that goal a 1,405 foot foreshore rock dike was constructed in 1995 at an elevation of +3.8 feet NGVD-29 along the bank of Boston Canal extending into Vermilion Bay. In 1997, two years after construction, the project was estimated to have protected 57.4 acres of marsh and 1.4 to 4.5 feet of sediment was deposited behind the breakwater while the reference area continued to erode. The rock breakwater at the mouth of Boston Canal was successful in stabilizing the shoreline (Thibodeaux 1998).
- Lake Salvador Shoreline Protection Demonstration (BA-15) project evaluated a series of shoreline protection measures at Lake Salvador, St. Charles Parish, Louisiana. Phase two of this project was conducted in 1998 and evaluated the effectiveness of a rock berm to protect the lake shoreline from higher energy wave erosion. Shoreline

surveys conducted behind the berm five months after construction indicated that the shoreline was still eroding. Subsequent surveys were not conducted due to poor weather conditions (LDNR 2000). The rock structure itself appears to be holding up well, showing little sign of deterioration and subsidence. The structure was designed to be constructed with a crest elevation of +4.0 feet NAVD-88. However, a 2002 survey of the rock dike determined that the average height of the structure was +2.51 feet NAVD-88. The average settlement of the structure, measured from 1998 to 2002, was approximately 0.29 feet. It was concluded that the rock dike was built to an inadequate crest elevation of +2.75 feet NAVD-88 (Darin Lee, LDNR, Personal Communications, July 19, 2002).

Table 1. Design Parameters of Constructed Shoreline Protection Projects (Sorted by Construction Date).

Project Name	Project Number	Region	Construction Date	Depth Contour (NAVD-88)	Length of Structure (feet)	Height	Distance From Shoreline (feet)
Blind Lake	N/A* (State)	4	1989	N/A	2,339	4.0 ft NAVD-88	70
Cameron Prairie National Wildlife Refuge Shoreline Protection	ME-09	4	1994	-1.0 ft	13,200	3.7 ft NAVD-88	0-50
The Freshwater Bayou Bank Protection	TV-11 (State)	3	1994	N/A	25,800	4.0 ft NAVD-88	N/A
Turtle Cove	PO-10 (State)	1	1994	N/A	1,640 (rock gabion)	3 ft (MWL)	300
Bayou Segnette	BA-16 (State)	2	1994,1998	N/A	6,800	3.0-5.0 ft NAVD-88	N/A
Boston Canal/Vermilion Bay Bank Protection	TV-09	3	1995	N/A	1,405	3.8 ft NGVD-29	N/A
Clear Marias Bank Protection	CS-22	4	1997	-1.2 ft	35,000	3.0 ft NGVD-29	0-50
Freshwater Bayou Wetlands Protection	ME-04	4	1998	-1.0 ft	28,000	4.0 ft NAVD-88	0-150
Freshwater Bayou Bank Stabilization	ME-13	4	1998	N/A	23,193	3.7-4.0 ft NAVD-88	N/A
Lake Salvador Shoreline Protection Demonstration	BA-15 Phase II	2	1998	-1.0 to 1.4 ft	8,000	Designed at 4.0 ft NAVD-88 built at 2.75 ft NAVD-88	100
Perry Ridge Shore Protection	CS-24	4	1999	N/A	12,000	3.7 to 4.0 ft NAVD-88	60
Jonathan Davis Wetland Protection	BA-20	2	2001	N/A	34,000	3.5 ft NAVD-88	N/A
Bayou Chevee Shoreline Protection	PO-22	1	2001	N/A	5,690	3.5 ft NGVD-29	300

*N/A indicates that information was not available.

- Intracoastal Waterway Bank Stabilization and Cutgrass Planting project at Blind Lake was a state only wetland restoration project constructed to prevent the Gulf Intracoastal Waterway (GIWW) and Sweet Lake from coalescing with Blind Lake (LDNR 1992). A limestone foreshore rock dike built at an elevation of +4.0 feet

NGVD-29 was placed 70 feet from the edge of the main channel along 2,339 feet of bank on a six-inch layer of shell and filter cloth. Large stones were used to prevent movement of rocks and to allow sediments and organisms passage. In 1991, two years after project completion an average increase in elevation of 0.32 feet in the area behind the dike was observed along transects from the deposition of suspended sediments. Data indicate that the project was successful in protecting the shoreline at Blind Lake and maintaining the hydrology of the Cameron-Creole watershed.

- The Turtle Cove Shoreline Protection (PO-10) was initiated in 1993 to protect a narrow strip of land in the Manchac Wildlife Management Area which separates Lake Pontchartrain from an area known as “the Prairie” (O’Neil and Snedden 1999). Wind induced waves contributed to a shoreline erosion rate of 12.5 feet per year. A 1,642 foot rock filled gabion was constructed 300 feet from shore at an elevation of 3 feet above mean water level with the goal of reducing erosion and increasing sediment accretion behind the structure. Post construction surveys conducted during the period of October 1994 to December 1997 revealed that the shoreline had prograded at a rate of 3.47 feet per year in the project area. The rate of sediment accretion, as determined from elevation surveys conducted in January 1996 and January 1997, was 0.26 feet per year.

The soils in The Prairie and Turtle Cove area consist of Allemands-Carlin peat which is described as highly erodible organic peat and muck soils (USDA 1972). Due to the weak and compressible nature of the subsurface soils, the gabions settled 0.59 feet in just over two years (October 1994 to January 1997) (O’Neil and Snedden 1999). Also, five years after construction the rock filled gabion structure exhibited numerous breaches and required extensive maintenance (LDNR 1999).

There are also several examples of successful projects involving the use of shoreline protection to stop erosion along navigation channel banks.

- The Freshwater Bayou Wetlands Protection (ME-04) project is positioned on the western bank of Freshwater Bayou Canal across from the proposed TV-11b project (Vincent et al. 1999). Construction of this project was initiated in January 1995 and includes construction of water control structures and a 28,000 linear foot foreshore rock dike designed with a crown elevation of +4.0 feet NAVD-88. Penland et al. (1990) estimated relatively low rates of subsidence and sea level rise, at 0.13 inches per year. Analysis of initial monitoring data suggests that the rock dike reduced wave-induced shoreline erosion after construction. The average rate of shore progradation between June 1995 and July 1996 was measured at 2.2 feet per year while the reference area continued to erode at an average rate of 6.7 feet per year (Raynie and Visser 2002). In contrast, between March 1998 and May 2001, the protected shoreline eroded an average of 2.6 feet per year while the reference area eroded at an average of 10.0 feet per year (Raynie and Visser 2002). Substandard recycled construction material and inadequate funds for maintenance of the structure, which were not disbursed in a timely manner, are believed to be the reason for the increase in erosion rates in the project area (Raynie and Visser 2002).

- The Cameron Prairie National Wildlife Refuge Shoreline Protection (ME-09) project, constructed in 1994, is located in north-central Cameron Parish and includes 350 acres of freshwater wetlands (Barrilleaux and Clark 2002). A 13,200-foot rock breakwater was constructed at an elevation of +3.7 feet NAVD-88, 50 feet from (and parallel to) the northern shore of the GIWW to prevent wave action from eroding the bank and breaching into the interior marsh. Aerial photography and survey points were used to monitor any changes in land to water ratio and shoreline position. Three years after construction results indicate that the project area shoreline advanced 9.8 ± 7.1 feet per year while the reference area retreated 4.1 ± 3.1 feet per year. A two-sample t-test revealed a significant difference was detected between the shoreline change rate and the project reference areas ($P < 0.001$).
- The Clear Marais Bank Protection (CS-22) project was constructed in 1997 at an elevation of +3.0 feet NGVD-29 to prevent breaches in the GIWW shoreline and subsequent erosion of the interior marsh while preventing saltwater intrusion (Miller Draft Report 2001). Approximately 35,000 linear feet of rip-rap was placed 50 feet from the northern shoreline of the GIWW. Results indicate that the foreshore rock dike has been effective in preventing erosion of the GIWW shoreline. A net gain of 13 feet per year occurred behind the rock structure while the reference area continued to erode (Raynie and Visser 2002).

Submerged Aquatic Vegetation

Submerged Aquatic Vegetation plays a crucial role in the littoral zone of aquatic ecosystems (Wetzel 1983). Submerged Aquatic Vegetation dissipates the energy of wind and wave action, reduces the amount of bottom sediment resuspension, serves as effective traps for inorganic and organic particulates, and provides suitable forage for ducks, invertebrates and larval fish (Spence 1982, Foote and Kadlec 1988, Lodge 1991). It is widely understood that the limiting factor controlling the recovery of SAV in lakes is light attenuation (Sager et al. 1998). Submerged aquatic vegetation habitat creation is expected to occur behind the shoreline protection structure in White Lake due to the reduction of turbidity in the shallow open water areas and the resulting increase in overall light penetration.

Summary/Conclusions

Projects such as TV-09, BA-15, CS-22 and ME-09, that were designed to an adequate elevation and located in areas with relatively good soil foundations, were successful in reducing erosion and promoting accretion due to occasional overwash of waves and subsequent deposition of sediment. However, ME-04 and PO-10 were not as successful over the long term due to poor soil foundations, improper design, the use of substandard materials, and/or inadequate maintenance funds.

According to the geotechnical report (USACE 2004) the soil foundation in the Grand Lake Shoreline Protection project area is considered poor. In an effort to reduce the overall pressure on the soil foundation, the structure will initially be built at an elevation of +3.0 feet NAVD-88. A maintenance lift, which will raise the structure elevation to an approximate height of +3.25 feet NAVD-88, is expected three years post-construction. There is some concern that two years after initial construction the structure will sink below mean water level (+1.45 ft

NAVD-88), one year prior to the scheduled maintenance lift (year three). However, the structure will be submerged for a relatively short period of time before the scheduled lift at year three is implemented and it was determined by the project team that the benefits of the project would not be significantly reduced. In addition, the dredged spoil placed landward of the structure during construction will offer additional protection to the Grand Lake shoreline.

VII 95% Design Review Recommendations

Based on information gathered from similar restoration projects, engineering designs and related literature, the proposed strategies in the Grand Lake Shore Protection project will likely achieve the desired goals. At this time, the Louisiana Department of Natural Resources, Coastal Restoration Division recommends that the Grand Lake Shoreline Protection project be considered for CWPPRA Phase 2 authorization.

This document reflects the current project design as of the 95% Design Review meeting, incorporates all comments and recommendations received following the meeting, and is current as of August 31, 2004.

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Enclosure 4-J

Section 303(e) Determination

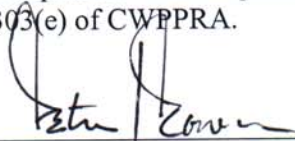
SECTION 303(e) DETERMINATION, CWPPRA

Project: Grand Lake Shoreline Protection Project, Cameron Parish, Louisiana

In accordance with section 303(e) of the Coastal Wetlands Planning, Protection and Planning Act, it has been determined that appropriate land rights will be acquired for construction, operation and maintenance of the project, subject to such terms and conditions as necessary to ensure that wetlands restored, enhanced or managed through this project will be administered for the long-term conservation of the lands and waters and the dependent fish and wildlife population. The proposed real estate rights to be acquired are legally sufficient and meet the long-term conservation objectives discussed above.

By letter dated July 6, 2004, Mr. W. Britt Paul of the Natural Resources Conservation Service advised that overgrazing does not occur on project lands or lands affected thereby, nor does he see the potential for grazing. If overgrazing should occur in the future, a grazing plan must be established for the project.

Accordingly, by the authority delegated to me by the Secretary of the Army, and given compliance with the provisions set forth above, I approve the project in accordance with Section 303(e) of CWPPRA.



Peter J. Rowan
Colonel, U.S. Army
District Engineer

Date: 17 Aug 04

Enclosure 4-K

Overgrazing Determination



Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302

July 6, 2004

Mr. Chris Monnerjahn
U.S. Army Corps of Engineers
New Orleans District
Planning and Project Management
Coastal Restoration Branch
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Monnerjahn:

RE: Grand Lake Shoreline Protection (ME-21)

I am in receipt of your request for an overgrazing determination for the Grand Lake Shoreline Protection (ME-21). I contacted our local district conservationist and our state resource conservationist to discuss the grazing in the project area. Currently, livestock are not grazing in the area nor do we see a potential for grazing once the project is installed. Therefore, it is our opinion that overgrazing is not a problem in this project area. If you have any questions, please let me know.

Sincerely,

A handwritten signature in dark ink, appearing to read "W. Britt Paul", is written above the typed name.

W. Britt Paul
Assistant State Conservationist
for Water Resources and Rural Development

cc: Bruce Lehto, Area Conservationist, NRCS, Leesville, Louisiana
Charles Starkovich, District Conservationist, NRCS, Lake Charles, Louisiana
Kevin Blomquist, State Grazing Lands Specialist, NRCS, Alexandria, Louisiana
John Jurgensen, Civil Engineer, NRCS, Alexandria, Louisiana

Enclosure 4-L

Revised Fully-Funded Cost Estimate

Enclosure 4-N

Prioritization Fact Sheet

PRIORITIZATION FACT SHEET

Updated November 21, 2006

Project Name and Number: Grand Lake Shoreline Protection; ME-21



Goals: 1) stop shoreline erosion along the South Shore of Grand Lake from Superior Canal to Tebo Point. 2) promote accretion between the breakwater and the shore.

Proposed Solution:

A final design has been developed and is recommended for construction. That design consists of approximately 37,800 linear feet of stone dike stretching from Superior Canal to the mouth of Catfish Lake with an option to place up to an additional 5,700 feet of dike to the west of the base project footprint (option reach). The Technical Committee and Task Force will be given the option to fund the increased length. This prioritization fact sheet covers both funding alternatives up for consideration. The rock dike will be situated along the -1.0-ft NAVD 88 contour in approximately 2.0 feet to 3.0 feet of water, stage dependant. The dike crown will be constructed to an elevation of +3.0 NAVD88 (+/-0.25') and have a width of approximately 4.0 feet. The dike will have front and back side-slopes of 1.0-foot vertical on 1.5-foot horizontal. The 37,800 lf of rock dike will benefit 445 acres of existing fresh marsh and 717 acres of open water (total 1,162 acres). Shoreline loss will be prevented and some marsh will accrete south of the breakwater so at the end of 20 years, 495 acres of marsh will be protected/created. The proposed extension around Tebo Point will benefit an additional 45 acres of fresh marsh and an additional 32 acres of open water. At the end of 20 years, an additional 45 acres will be protected/created. There will be a low degree of risk associated with this project because monitoring has indicated that breakwaters significantly reduce erosion. The project should continue providing benefits more than 20 years after construction because there is a scheduled maintenance event in year 3 and year 15.

Proposed Prioritization Criteria Scores and Justification

I. Cost Effectiveness (cost/net acre)

Grand Lake SP without extension:

The estimated total fully funded project cost provided by Mr. Allan Hebert, chair of the Economics Workgroup, on November 17, 2006 is \$24,117,374. The project benefits 495 total acres. Therefore, the cost per acre for this project is \$48,722/acre.

The proposed score for this criterion is 5.

Grand Lake SP with extension:

The estimated total fully funded project cost provided by Mr. Allan Hebert, chair of the Economics Workgroup, on November 17, 2006 is \$21,737,859. The project benefits 540 (495+45) total acres. Therefore, the cost per acre for this project is \$40,255/acre.

The proposed score for this criterion is 5.

II. Area of Need, High Loss Area

According to a comparison of the 1978-79 aerial photography with 1997-98 photography, shoreline erosion rates in this area vary from 11 to 32 feet per year. The project is located in the Mermentau Basin. According to Kevin Roy's spreadsheet, the FWOP loss rate is 25 ft/year. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 7.5.**

Grand Lake SP with extension: **The proposed score for this criterion is 7.5.**

III. Implementability

The project has no obvious issues affecting implementability. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 10.**

Grand Lake SP with extension: **The proposed score for this criterion is 10.**

IV. Certainty of Benefits

The project is an inland shoreline protection project. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 10.**

Grand Lake SP with extension: **The proposed score for this criterion is 10.**

V. Sustainability of Benefits

According to the prioritization procedures, the full project benefits are not expected to continue beyond TY 20 because the breakwater would not be maintained beyond the end of the CWPPRA project life. It is, however, anticipated that the breakwater would continue to perform fully from TY21 - TY27, would only prevent 75% of the shoreline erosion between TY28 and TY30.

Grand Lake SP without extension:

TY21-TY27 0 ft/yr eroded = 0 ft/yr X 37,800 ft = 0 acres

TY28-TY30 6.15 ft/yr eroded = 6.15 ft/yr X 37,800 ft = 232,470 ft² ÷ 43560 = 5.34 ac/yr

Target Year	Baseline Erosion 24.6 ft/yr
20	495 acres
21	495 acres
22	495 acres
23	495 acres
24	495 acres
25	495 acres
26	495 acres
27	495 acres
28	495 ac - 5.34 ac = 489.66 acres
29	489.66 ac - 5.34 ac = 484.32 acres
30	484.32 ac - 5.34 ac = 478.98 acres

The net change in acres of marsh from TY 20 to TY 30 = -16.02 (495-478.98), which is a 3.24% decrease (16.02 acres/495 acres = 0.0324).

Grand Lake SP without extension: **The proposed score for this criterion is 10.**

Grand Lake SP with extension:

TY21-TY27 0 ft/yr eroded = 0 ft/yr X 43,500 ft = 0 acres

TY28-TY30 6.15 ft/yr eroded = 6.15 ft/yr X 43,500 ft = 267,525 ft² ÷ 43560 = 6.14 ac/yr

Target Year	Baseline Erosion 24.6 ft/yr
20	540 acres
21	540 acres
22	540 acres
23	540 acres
24	540 acres
25	540 acres
26	540 acres
27	540 acres

28	540 ac – 6.14 ac = 533.86 acres
29	533.86 ac – 6.14 ac = 527.72 acres
30	527.72 ac – 6.14 ac = 521.58 acres

The net change in acres of marsh from TY 20 to TY 30 = -18.42 (540-521.58), which is a 3.41% decrease (18.42 acres/540 acres = 0.0341).

Grand Lake SP with extension: **The proposed score for this criterion is 10.**

VI. Increasing riverine input in the deltaic plain or freshwater input and saltwater penetration limiting in the Chenier plain

The project will not affect freshwater inflow or salinity. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 0.**

Grand Lake SP with extension: **The proposed score for this criterion is 0.**

VII. Increased sediment input

The project will not increase sediment input over that presently occurring. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 0.**

Grand Lake SP with extension: **The proposed score for this criterion is 0.**

VIII. Maintaining or establishing landscape features critical to a sustainable ecosystem structure and function

The project serves to protect, for at least the 20-year life of the project, the Grand Lake shoreline (a landscape feature), which is critical to the mapping unit. See prioritization criteria. The score will be the same with or without the extension.

Grand Lake SP without extension: **The proposed score for this criterion is 5.**

Grand Lake SP with extension: **The proposed score for this criterion is 5.**

Weighting per Criteria:

Grand Lake SP without extension:

Total Prioritization Score: 61.25

CRITERION		Weight	Score	Weighted Score
I	Cost-Effectiveness	2.0	5	10
II	Area of Need	1.5	7.5	11.25
III	Implementability	1.5	10	15
IV	Certainty of Benefits	1.0	10	10
V	Sustainability	1.0	10	10
VI	HGM Riverine Input	1.0	0	0
VII	HGM Sediment Input	1.0	0	0
VIII	HGM Structure and Function	1.0	5	5
TOTAL				61.25

Grand Lake SP with extension:

Total Prioritization Score: 61.25

CRITERION		Weight	Score	Weighted Score
I	Cost-Effectiveness	2.0	5	10
II	Area of Need	1.5	7.5	11.25
III	Implementability	1.5	10	15
IV	Certainty of Benefits	1.0	10	10
V	Sustainability	1.0	10	10
VI	HGM Riverine Input	1.0	0	0
VII	HGM Sediment Input	1.0	0	0
VIII	HGM Structure and Function	1.0	5	5
TOTAL				61.25

Preparers of Fact Sheet

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Kenneth Duffy, LDNR PM, 225-342-4106, kend@dnr.state.la.us

References

None cited

Project Map

