Demonstration and Coastwide Project Proposals

The following Demonstration and Coastwide Project Proposals have not been evaluated by the CWPPRA Workgroups yet. Therefore they have not been deemed officially eligible, at this time, according to CWPPRA Guidelines. An update will be posted after the review is complete.

Demonstration Project

DEMO-01	Tawny Crazy Ant Demo	EPA
DEMO-02	Wave Robber	Independent

Coastwide Project

CW-01	Coastwide Living Shorelines	NMFS

PPL31 Tawny Crazy Ant (*Nylanderia fulva*) Characterization, Prevention, and Control Demonstration Project

Potential Demonstration Project Location:
Current/Active Marsh Creation construction sites
Natural Marsh areas (control)

Problem:
The tawny crazy ant (*Nylanderia fulva*), named for its erratic and frenzied movement, has invaded Louisiana. Restoration professionals and the general public may not be aware of the detrimental ecological and structural potential of this invasive ant species. These ants may be extending their range via the heavy equipment used to construct restoration projects. Thus, CWPPRA could be harming its project areas or facilitating invasion and consequently, destruction of natural marsh areas. Since the ant may only have recently extended its range into restoration projects, a CWPPRA demonstration project would be a mechanism for detection, prevention, and control.

Background:
The tawny crazy ant is from South America and arrived in the southern US in the early 2000s. It was discovered in Louisiana in car dealerships and construction sites. Dr. Linda Hooper-Bui, Professor, Louisiana State University Department of Environmental Sciences, reported the discovery of this highly invasive ant in Louisiana to USDA-APHIS and to the Louisiana Department of Agriculture and Forestry in 2009.

The ant has interconnected nests with multiple queens that produce extremely high numbers of worker ants, sometimes called a "supercolony." It causes "ecosystem meltdown," disrupting the functioning of natural ecosystems by reducing the abundance and diversity of other insect species that serve as the basis of the food chain. The impacts ripple through other levels of the food chain, including higher levels of the food chain (i.e., vertebrates that eat insects) or reducing plant proliferation. It has a broad diet that includes insects, plants, scat, and ground-dwelling vertebrates, which they weaken via harassment. Tawny crazy ants are impervious to the stings of fire ants and do more damage to native ecosystems. The tawny crazy ant has the potential to overwhelm the native fauna of the marsh and it is uncertain whether natural or restored marshes can withstand invasion.

The queen is flightless, which means that the spread of the ant is primarily caused by humans and anthropogenic sources like "stowing away" in vehicles or in plants at local nurseries. The ant will invade and colonize the walls of buildings, heavy equipment, cars, etc. and chew wiring causing electrical failures. The ants can access structures and equipment by climbing tree branches in close proximity or building bridges with bodies of other ants. The ant can also survive flooding events. This ant has killed newborn cattle, decimated beehives, and "cultivates" sap-sucking insects that kill plants and crops. It has been implicated in damaging field and fruit crops in inland Louisiana. Once it has invaded an area, it is nearly impossible to eradicate.

Goals:
This demonstration project aims to 1) professionally verify that the ant observed in Louisiana is the tawny crazy ant, 2) characterize current restoration projects for the presence and quantity of the ants, 3) test different prevention and control strategies, 4) determine which prevention or control strategies are most effective and develop language suitable for contracts and/or other protocols.

Proposed Solution:
This demonstration project proposes to detect/verify the presence of the ant and develop prevention techniques for routine application in coastal Louisiana. It is unknown whether there is an accurate assessment of its range in Louisiana because restoration professionals, heavy equipment operators, and the public may not be aware of its presence and it requires an expert to properly identify it. Currently, there are no detection or preventative measures listed in construction contracts/specifications.

Project Benefits:
The proposed project would improve the knowledge of the current range of the ant in coastal Louisiana and determine effective prevention strategies and best management practices to limit/prevent the introduction and/or spread of this invasive ant species into restoration projects.

Innovativeness – This project demonstrates innovativeness in that detection and/or prevention protocols have not been investigated or developed to detect/prevent invasion of the tawny crazy ant into restoration projects. It would not duplicate other techniques because the ant is a "new" invasive species. The focus of this proposal is to identify/verify the presence of the ant and to prevent/control the ant so that the CWPPRA program is not aiding in the introduction or facilitation the spread of an invasive species into natural marsh areas or restoration project areas.

Applicability or Transferability – The protocols, techniques or best management practices developed by this project would be applicable coast-wide; wherever there is a restoration project that uses heavy equipment, etc. The practices could be transferred and implemented by other types of projects using heavy equipment.

Potential Cost-Effectiveness – The potential cost effectiveness cannot be calculated at this time; however, prevention is more cost effective than abatement or eradication of an invasive species. The goal is to limit the introduction and spread of the ant, particularly through CWPPRA restoration projects.

Potential Environmental Benefits – This project would create benefits similar to the Coastwide Nutria Control Program (LA-03b) or the Coastwide Salvinia Weevil Propagation Facility project (LA-284) in that this demonstration project seeks to avoid or mitigate factors that would negatively impact the marsh and/or marsh creation projects. In addition, if ants are being introduced into coastal wetland areas through construction activities, then CWPPRA could be aiding in the introduction and spread of a very destructive invasive species, a definite negative consequence.

Recognized Need for the Information to be Acquired – The proposed project would have goals of verifying the identification of the ant as well as characterizing its presence and abundance in restoration projects (particularly marsh creation projects) and adjacent natural marshes. There is a definite need to develop detection/prevention/control strategies to prevent/limit the introduction and spread of the ant.

Potential for Technological Advancement – The techniques developed may build upon current invasive species management techniques and/or create new ones. It is unknown what kinds of prevention and control strategies will be effective; hence, that is one of the goals of this demonstration project.

Project Costs:
The estimated cost including materials, salary, transportation, and monitoring for two years would be $275,000.

Contacts:
Linda Hooper-Bui, Ph.D.; Louisiana State University; lindabui@lsu.edu
Sharon L. Osowski, Ph.D.; EPA; (214) 665-7506; osowski.sharon@epa.gov

photo by Mike Quinn, TexasEnto.net

Tawny Crazy Ant (*Nylanderia fulva*) Characterization, Prevention, and Control Demonstration Project

Photo by Mike Quinn, TexasEnto.net

Coastal Wetlands Planning, Protection and Restoration Act

Problem

- The tawny crazy ant has invaded LA; we do not know the extent
- Linda Hooper-Bui first to identify it in LA
- Found in restoration projects, but not natural marsh
- Once it has invaded, it is nearly impossible to eradicate
- Extend their range via the heavy equipment like that used to construct marsh restoration projects
- CWPPRA could be harming its own project areas or facilitating further spread

Proposed Solution

This demonstration project proposes to detect/verify the presence of the ant and develop prevention techniques for routine application in coastal Louisiana.

It is unknown whether there is an accurate assessment of its range in Louisiana because restoration professionals, heavy equipment operators, and the public may not be aware of its presence and it requires an expert to properly identify it.

Currently, there are no detection or preventative measures listed in construction contracts/specifications.

Ecology and Life History

- Tawny crazy ant (*Nylanderia fulva*) originated in South America
- Arrived in the southern US in the early 2000s in car dealerships and construction sites.
- Causes "ecosystem meltdown" reducing the abundance and diversity of other species in the food chain

Photo by Mike Quinn, TexasEnto.net

Wikipedia Commons

Ecology and Life History

(photo by Joe A. MacGown)
https://www.mississippientomologicalmuseum.org.msstate.edu

- Causes electrical short outs in equipment
- Stows away in cars, etc.
- Form massive colonies interconnected "supercolonies"
- Impervious to stings/venom of fire ants
- Weaken vertebrates via harassment
- No predators or competitors in US (niche partitioning)
- S America has virus and parasites as well as competitors to keep ant in check

Photo by Joe MacGown entomology Miss State Univ

http://52.64.242.214/problem-ants/impacts-of-invasive-ants Photo by Stefan Kropidlowski/USFWS

Goals

- Verify that the ant observed in Louisiana is the tawny crazy ant
- Characterize current restoration projects for presence and abundance
- Test different prevention and control strategies
- Determine which prevention or control strategies are most effective and develop language suitable for contracts, specs, etc.

Benefits

- The proposed project would improve the knowledge of the current range of the ant in coastal Louisiana and determine effective prevention strategies and best management practices to limit/prevent the introduction and/or spread of this invasive ant species into restoration projects or natural marsh areas.

- This project would create benefits similar to the Coastwide Nutria Control Program (LA-03b) or the Coastwide Salvinia Weevil Propagation Facility project (LA-284) in that this demonstration project seeks to avoid or mitigate factors that would negatively impact the marsh and/or marsh creation projects. In addition, if ants are being introduced into coastal wetland areas through construction activities, then CWPPRA could be aiding in the introduction and spread of a potentially very destructive invasive species, a definite negative consequence.

Project Costs:
The estimated cost including materials, salary, transportation, monitoring, etc. for two years would be $275,000.

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Linda Hooper-Bui, Ph.D.; Louisiana State University; lindabui@lsu.edu

Sharon L. Osowski, Ph.D.; EPA (214) 665-7506 osowski.sharon@epa.gov

More *Nylanderia fulva* info:
https://www.youtube.com/watch?v=NgpCXGsC6PU
https://www.youtube.com/watch?v=RWg-CObnJy0
https://www.youtube.com/watch?v=E1sN1xBKRB8

STOPPING COASTAL EROSION IN ITS Tracks

The Wave Robber®

80 % of the Nation's Coastal Land Loss Occurs in Louisiana

- Louisiana loses the equivalent of one football field every 15 minutes
- Reasons for land loss we have **little** control of:
  - Saltwater intrusion
  - Subsidence
  - Some human disturbance
- A primary reason for land loss we **can now control** with The **Wave Robber®**
  - Shoreline erosion and lack of sediment collection to rebuild it.

CPRA to Spend $50B in 50 years with a net land loss!

With technology available today, we can't build land as fast as we lose it. The **Wave Robber®** can change that dynamic. It CAN STOP the **EROSION,** providing human ingenuity the time to build projects that will last. With the **Wave Robber®** protecting marsh creation projects, they will last. With the **Wave Robber®** protecting the shoreline of bays, bayous and canals (like the Intercoastal Canal), erosion will be halted and collected sediment will begin the natural rebuilding process.

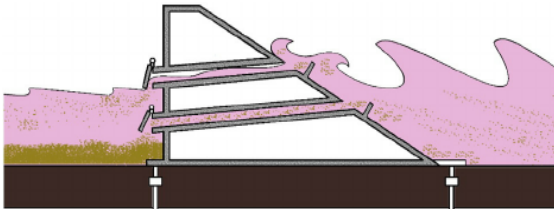
What is the Wave Robber® and how does it work?

It is a uniquely designed, patented system of heavy-duty molded plastic, engineered to protect the shoreline from erosion while capturing sediment behind the unit to rebuild shore. The approximately 8'wide units are attached together the length of the coast to be protected. Weirs are installed every 100'or so to allow water and fisheries the ability to return, while remaining water evaporates, and sediment accumulates.

The **Wave Robber®** was invented in 2009, patented in 2012 and has been researched, studied and field tested by UL and LSU coastal engineering professionals during that time. The **Wave Robber®** was selected in a nation-wide NRCS competition and BESSE Board grant funded. It works as advertised, stopping erosion and building marsh.

Two Wave Robber® Units

- Shore line protection/sediment retention
- Erosion Control
- Reclaim Land Loss



Inexpensive ● Estimate 25+ year life ● Easy to install ● Minimal maintenance ● Supports **preservation of estuaries and Gulf ecosystems** ● Effectively prevents erosion by protecting shoreline ● **Establishes new marsh** ● It is time to let **Wave Robber®** stop marsh erosion!

For information: Call Dick Eglé 504.273.1302 email: egler@egleassociates.com

The Wave Robber®

Invented by Webster Pierce
Patent issued July 24, 2012

An inexpensive, but Effective ADDITION to EXISTING Coastline Restoration Efforts

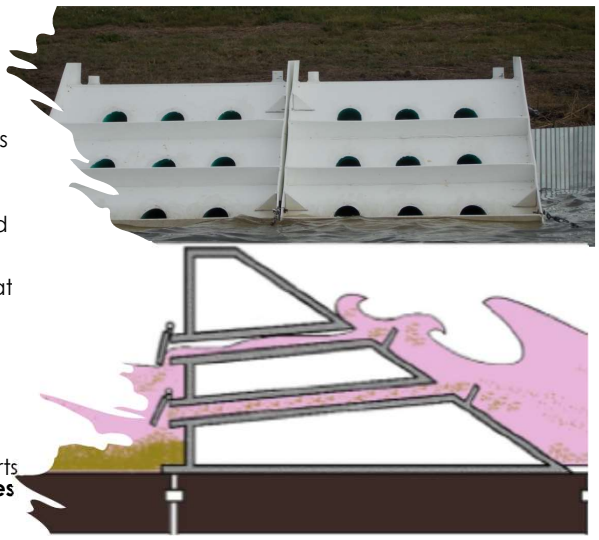
Presenter: Richard Eglé

Signed on and available to field questions after presentation:

Webster Pierce, Inventor
Dr. Daniel Gang, UL Distinguished Professor of Environmental Engineering
Dr. Chunyan Li, Professor of Physical Oceanography, LSU

About the Wave Robber®

- The **Wave Robber®** was invented in 2009, patented in 2012 and has been researched, studied and field tested by UL and LSU coastal engineering professionals during that time. It works as advertised, stopping erosion and building marsh.
- Inexpensive ● Estimate 25+ year life ● Easy to install ● Minimal maintenance ● Supports **preservation of estuaries and Gulf ecosystems**



What is a Wave Robber®?

- A collection of HDPE lightweight plastic pre-fab modules
- Designed to be a physical barrier breaking up wave energy impact while depositing suspended sediment
- Wave Robber system includes modules, weir units, mounting base units and an anchoring system.
- Coastline protection strings modules attached to one another the length of coast to be protected
- Weirs placed approximately every 100' maintain the important hydrologic connectivity between open water and shoreline environment

Dr. Daniel Gang, UL 3-year Field Test Conclusions:

Wave Robber® system, working in both wave reduction and sediment collection, is an effective alternative shoreline protection structure

Wave Robber® system has wave energy reflections of 0.47–0.83 and wave energy dissipation between 0.49 and 0.88.

The sensitivity study shows that wave height and initial suspended solid concentration are the most important factors effecting sediment collection

Field site investigations revealed that land buildup ranged from 0.15-0.9 ft/year

Sediment buildup over Feldspar clay (white layer), documents Dr. Gang's Conclusions

Wave Robber® Flexibility and Multiple Uses

- In addition to stopping erosion, can be used as retention dike alternative for dredged sediment or barriers in beneficial use dredging projects
- Modules are light weight and buoyant making them easy to transport and install
- Modules are self contained and independent of each other and if damaged, any one or more can be easily replaced
- Modules can be truck or barge transported, offloaded directly to water and floated to location
- Soil anchors assure stability of the units
- Modules are reusable. With land reclamation success, the units can be relocated to other projects creating great savings.

Wave Robber® CWPPRA Demonstration Site and Cost Analysist

Wave Robber® Site Selection

- The site selected is approximately 2,000 linear feet of partially eroded marsh that makes up the toe of the Larose to Golden Meadow Hurricane Protection Levee in Section D South

Cost

- Unknown factors are water depth, soil condition, cost of oil (impact on price of HDPE plastic)
- Estimated cost of Wave Robber® protection system is $950/linear foot, plus mobilization, demobilization and installation.

Wave Robber®

Wave Robber™ Field Validation

December 2012 February 2014

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Coastwide Projects

PPL31 PROJECT NOMINEE FACT SHEET
February 2, 2021

Project Name
Coastwide Living Shorelines

Project Location
Coastwide

Problem
Energy from wind driven waves is the primary driver of marsh-edge retreat, causing significant shoreline erosion throughout coastal Louisiana. This results in the loss of significant amounts of marsh vegetation and wetland soils, while also increasing the turbidity in system. Fringing oyster reefs can attenuate wave energy and help to stabilize marsh edges; however, the hard substrate required to establish, encrust, and grow new reefs is a limiting factor across our deltaic estuaries. Left unchecked, the erosion and collapse of marsh edges and loss of naturally occurring oyster reefs perpetuates a negative feedback loop of increased soil erosion, loss of habitat, and addition negative impacts to marsh ecosystems.

Goals
The goal of the project is threefold: 1) to coalesce a network of stakeholders to communicate and share information on living shoreline implementation efficiencies; 2) identify and operate regional collection sites to recycle oyster shell and stockpile other reef building materials; and 3) construct 12 miles of living shorelines throughout coastal Louisiana, thereby protecting and conserving 154 acres of marsh shoreline habitat by creating over eight acres of oyster reefs.

Proposed Solution
The overall objective of the project is to construct 12 miles of living shorelines across coastal Louisiana and conserve approximately 154 acres of rapidly eroding coastal marsh habitat. To achieve this objective, the project aims to build upon the knowledge and experience gained via existing living shoreline and oyster reef projects (e.g., CRCL, TNC, CCA), and expand these construction efforts coastwide. The project solution is to foster and expand this network of partners to collect stockpiles of reef materials at multiple locations throughout the state to construct living shorelines coastwide. Collection points will serve to recycle oyster shell and/or stockpile other suitable reef materials, including but not limited to reef modules, formed concrete, recycled concrete, and other materials of opportunity. These locations could also be used for outreach and engagement with stakeholders and partners, including volunteer reef construction events. Living shorelines will be designed using these source materials in a hybrid nature-based solution to establish fringing oyster reefs and reduce wave energy while maximizing ecosystem benefits.

Preliminary Project Benefits

1) *What is the total acreage benefited both directly and indirectly?*
   This total project area is 202 ac of marsh conserved through the construction of 12 miles of living shoreline oyster reefs across Louisiana's coastal regions.

2) *How many acres of wetlands will be protected/created over the project life?*

Approximately 150 – 200 ac of marsh will be protected/conserved over the project life.

3) *What is the anticipated loss rate reduction throughout the area of direct benefits over the project life (e.g., 50% reduction in the background loss rate)?*
A 90% loss rate reduction is assumed for the marsh protected by the living shoreline reefs.

4) *Do any project features maintain or restore structural components of the coastal ecosystem such as barrier islands, natural or artificial levee ridges, beach and lake rims, cheniers, etc?*
The project will help protect 12 miles of marsh shoreline across Louisiana coastal regions, with specific sites helping maintain the integrity of the Calcasieu Lake rim along West Cove, along with multiple coastal islands (Rabbit Island, Marsh Island, Biloxi Marsh islands).

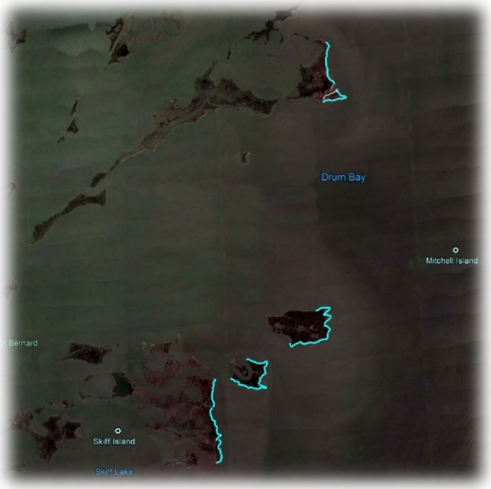
5) *What is the net impact of the project on critical and non-critical infrastructure?*
The project may have minor net positive impact to non-critical infrastructure comprised of pipelines and public access points, as well as serving as an intertidal broodstock oyster reefs to provide benefits to the surrounding public oyster seed grounds.

6) *To what extent does the project provide a synergistic effect with other approved and/or constructed restoration projects?*
The project will have synergistic effects with multiple restoration projects in each of the respective project areas.

Considerations
The proposed project has potential considerations for public oyster grounds and oyster leases, land rights, utility/pipeline, and oil and gas infrastructure.

Preliminary Construction Costs
The estimated construction cost plus 25% contingency is $15M - $20M.

Preparer(s) of Fact Sheet:
Craig Gothreaux, NOAA Fisheries, 225-380-0078, craig.gothreaux@noaa.gov



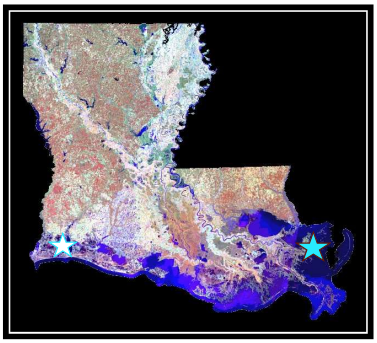
PPL31 Coastwide Living Shorelines

202 acres of marsh conservation
8 acres of oyster reed creation

Federal Sponsor: NOAA Fisheries
2017 Aerial Imagery
Map Date 2-2-2021

Coastwide Living Shorelines
Biloxi Marsh Example

NOAA FISHERIES



REGION 1: Pontchartrain Basin

Presenter: Craig Gothreaux, Fisheries Biologist, NOAA

Special Thanks
The Nature Conservancy (TNC)
Coalition to Restore Coastal Louisiana (CRCL)
Coastal Conservation Association (CCA)
The Meraux Foundation

PPL31 CWPPRA Regional Planning Team Meeting
February 4, 2021

Project Objective

Coastwide Living Shorelines

Construct 12 miles of Living Shorelines

- **Four implementation phases** (~*3 miles per phase*) at Years 1, 3, 5, & 7

Restoration technique: ***Oyster reef living shorelines across multiple basins***

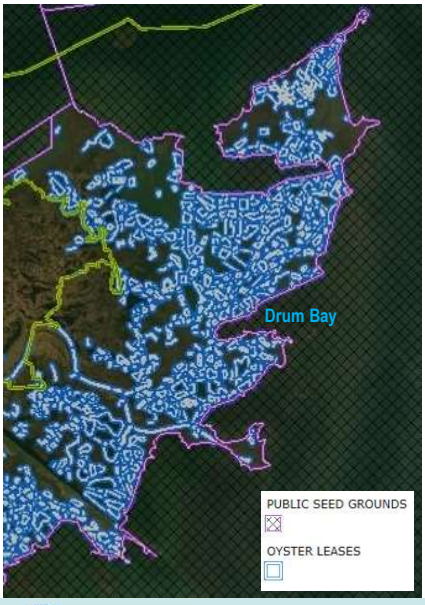
- **Benefits –** *dissipate wave energy, reduce marsh edge erosion*
- **Opportunities –** *cost scaling efficiencies, address priority areas*
- **Challenges –** *site specific reef designs, supply chain limitations*

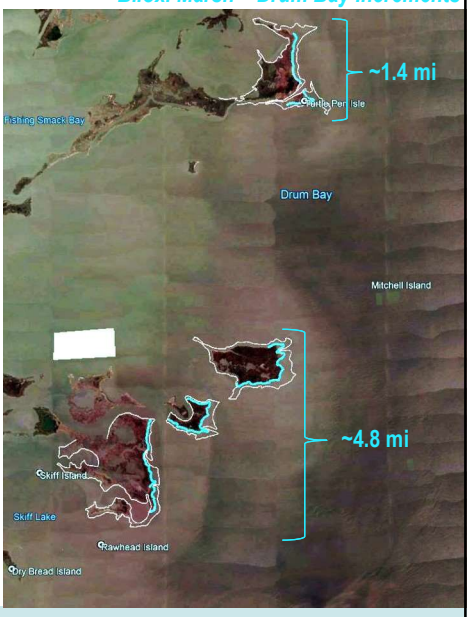
Project Area Synergy

Coastwide Living Shorelines
Biloxi Marsh – Drum Bay Increments

Project Area Importance

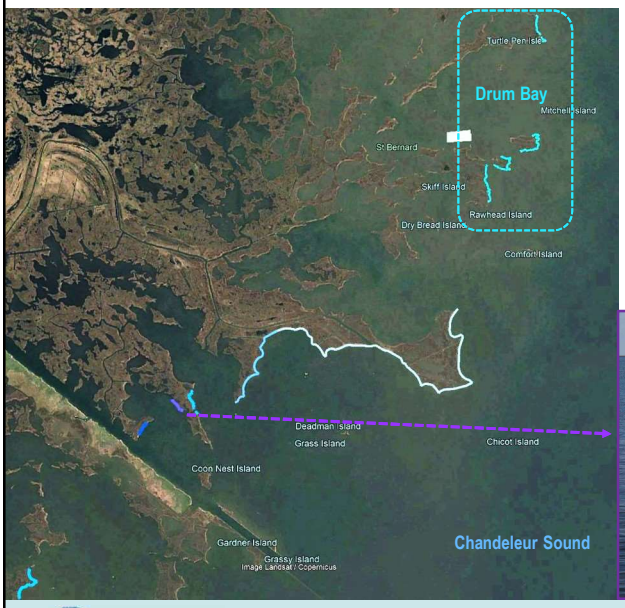
Coastwide Living Shorelines
Biloxi Marsh – Drum Bay Increments





Project Area Synergy

Coastwide Living Shorelines
Biloxi Marsh – Drum Bay Increments

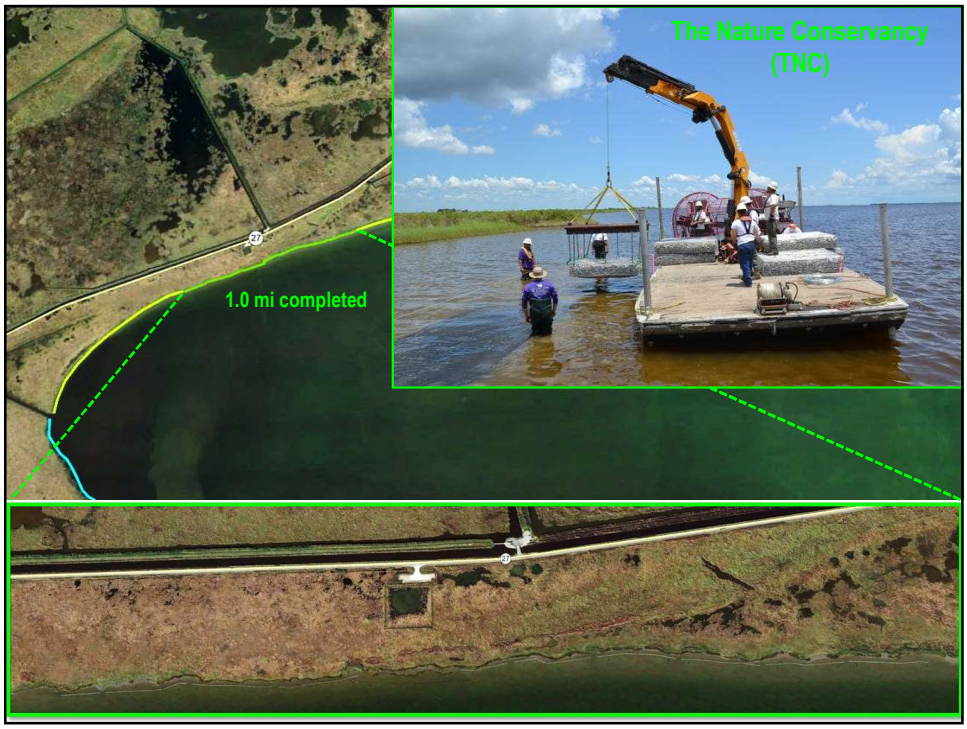


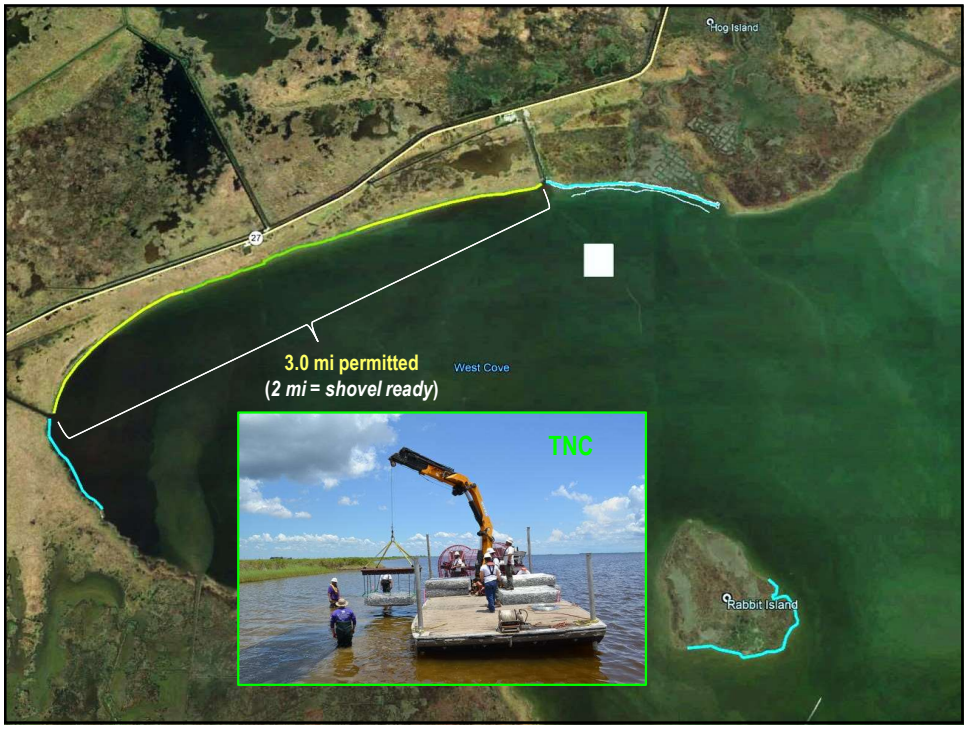
Extension of existing living shoreline projects in the Biloxi Marsh

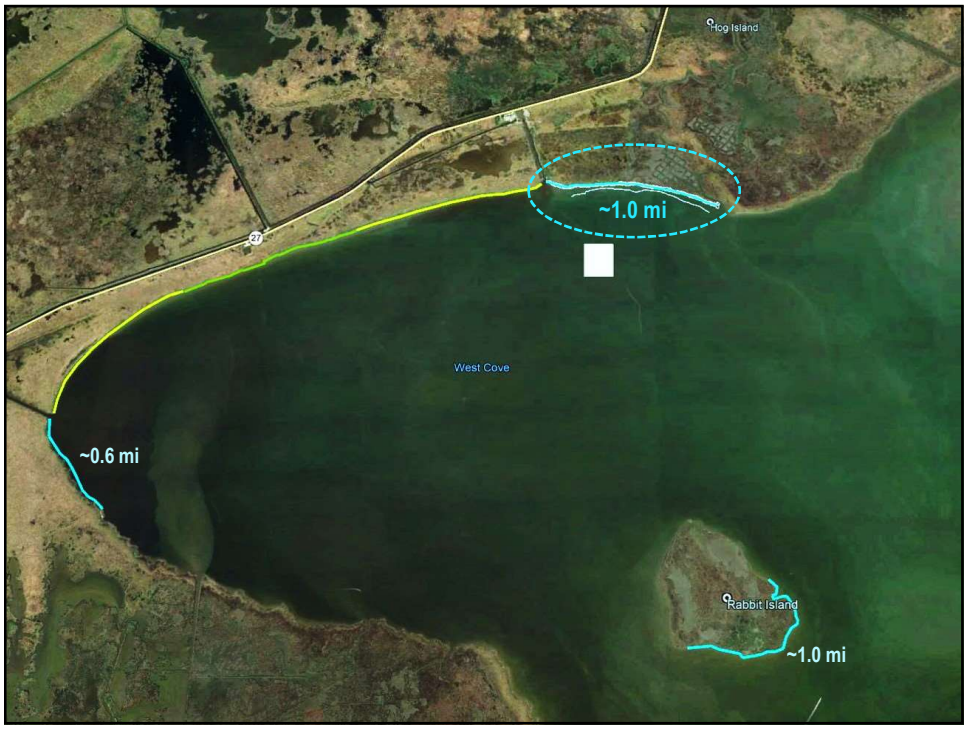
Variety of TNC project designs including CRCL's oyster shell gabions

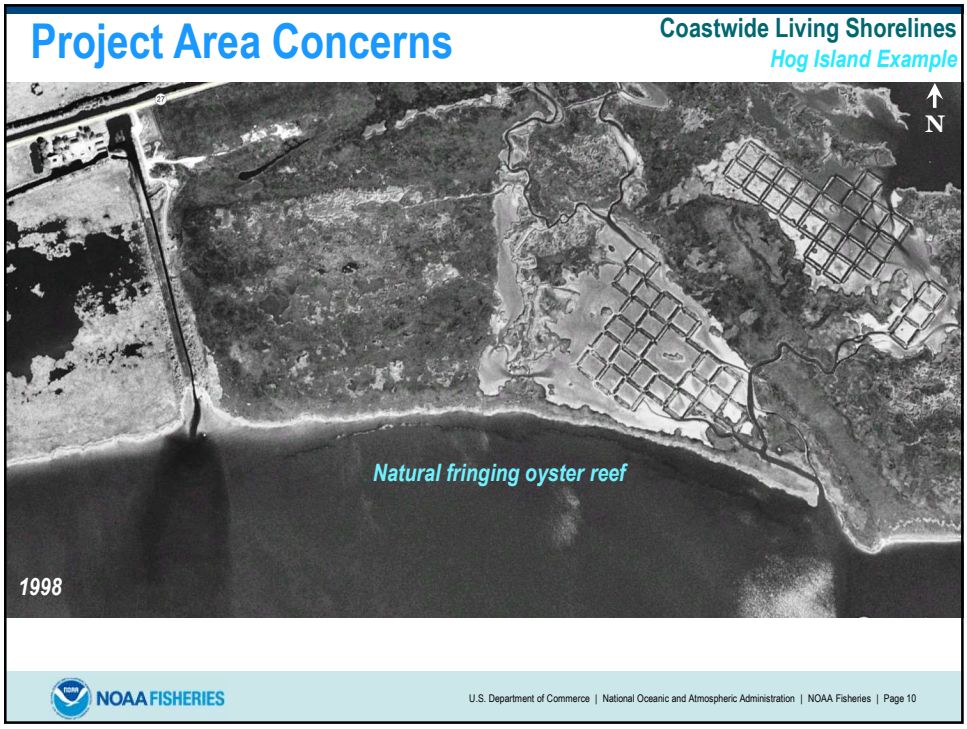
Project Area Synergy

Coastwide Living Shorelines
Calcasieu – West Cove Increments


The Nature Conservancy
(TNC)
1.0 mi completed


Hog Island
3.0 mi permitted
(2 mi = shovel ready)
West Cove
TNC
Rabbit Island


Hog Island
~1.0 mi
West Cove
~0.6 mi
Rabbit Island
~1.0 mi


Project Area Concerns
Coastwide Living Shorelines
Hog Island Example
N
Natural fringing oyster reef
1998
NOAA FISHERIES
U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries | Page 10

Project Area Concerns

Coastwide Living Shorelines
Hog Island Example

Project Area Solution

Coastwide Living Shorelines
Hog Island Example

Project Elements

Coastwide Living Shorelines

Primary Objective:
Construct 12 miles of Living Shorelines

- Four implementation phases (*~3 miles per phase*) at Years 1, 3, 5, & 7

Lessons Learned

Coastwide Living Shorelines

Supply chain of preferred substrate limited across the coast

CRCL OYSTER SHELL RECYCLING PROGRAM

Restoration Solutions

Coastwide Living Shorelines

Restoration Solutions

Coastwide Living Shorelines

CRCL OYSTER SHELL
RECYCLING PROGRAM

Restoration Solutions

Coastwide Living Shorelines

Materials

Modules

Deployment

Community Reef Projects

Large-scale Reefs

Summary

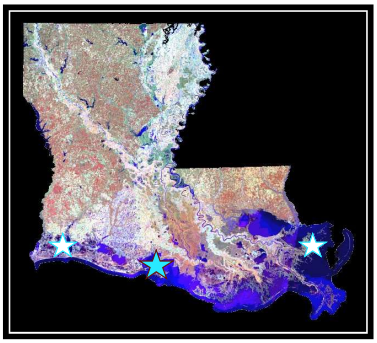
Coastwide Living Shorelines Project

- **202 Total Project Acres**
  - 202 Acres Marsh Conserved/Protected
  - Eight Acres of Oyster Reefs Created
    - *12 miles of Living Shorelines Coastwide (Phased)*
- **Construction Cost + 25% Contingency: $15M – $20M**
- **Net Benefits: 150 – 200 Acres**

Contact information:
Craig Gothreaux, 225-380-0078
craig.gothreaux@noaa.gov

Coastwide Living Shorelines
Marsh Island Increments

NOAA FISHERIES



REGION 3: Teche-Vermilion, Atchafalaya, and Terrebonne Basins

Presenter: Craig Gothreaux, Fisheries Biologist, NOAA

Special Thanks

The Nature Conservancy (TNC)

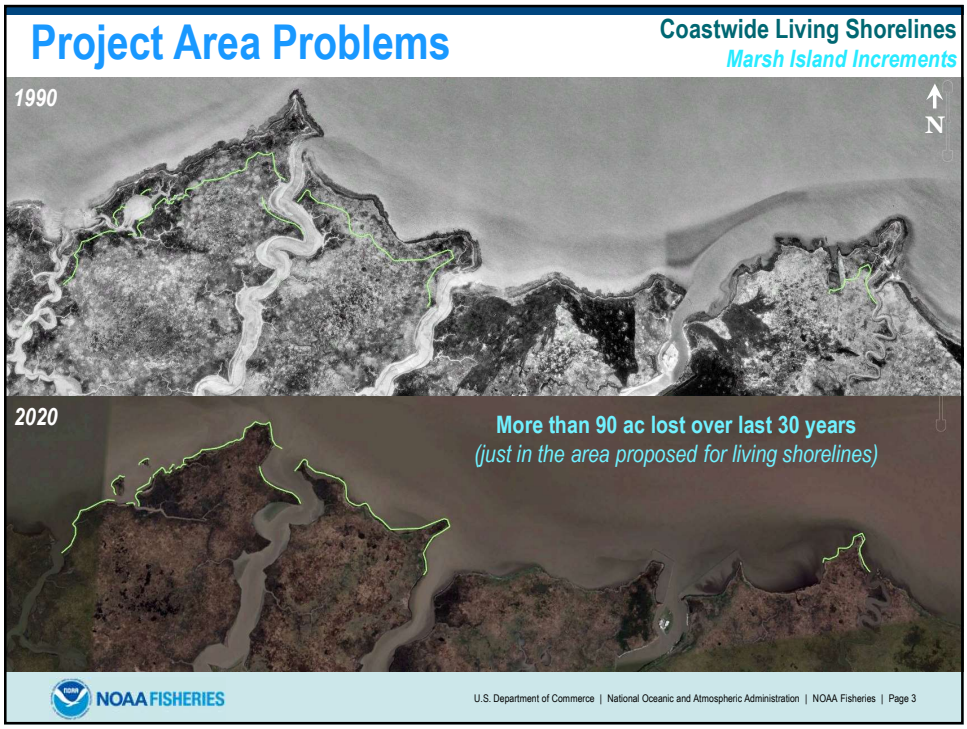
Coalition to Restore Coastal Louisiana (CRCL)

Coastal Conservation Association (CCA)

PPL31 CWPPRA Regional Planning Team Meeting

February 3, 2021

Project Vicinity


Project Area Problems
Coastwide Living Shorelines
Marsh Island Increments
1990
N
2020
More than 90 ac lost over last 30 years
(just in the area proposed for living shorelines)
NOAA FISHERIES
U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries | Page 3


Project Area Solution
Coastwide Living Shorelines
Marsh Island Increments
N
Construct ~3 miles of Living Shorelines
Protect eroding marsh edge and points
~ 1.6 mi
~ 1.0 mi
~ 0.4 mi
Bayou Platte
2017
Partnerships
Material Collections
Living Shorelines
NOAA FISHERIES
U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries | Page 4

Project Synergy

Coastwide Living Shorelines

Project Elements

Coastwide Living Shorelines


Collection Points


Staging Areas


Living Shorelines

Summary

Coastwide Living Shorelines Project

- **202 Total Project Acres**
  - 202 Acres Marsh Conserved/Protected
  - Eight Acres of Oyster Reefs Created
    - *12 miles of Living Shorelines Coastwide*
- **Construction Cost + 25% Contingency: $15M – $20M**
- **Net Benefits: 150 – 200 Acres**

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