# Restoring Oystercatcher Nesting Habitat at Gomez Key

*Objective: Restore Gomez Key using resilient Natural and Nature-Based Features (NNBF) to conserve breeding American Oystercatchers*

Janell Brush and Joe Marchionno

Natural Resource Damage Assessment and Restoration Program

Restoration Program

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

American OYSTERCATCHER WORKING GROUP

UF
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Natural Resource Damage Assessment and Restoration Program
U.S. DEPARTMENT OF THE INTERIOR MARCH 3, 1849
Restoration Program

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NFWF

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NATURE COAST
BIOLOGICAL STATION


Julia Magill


Joe Marchionno
DO NOT ENTER


Kristin Taylor


Gianna Arcuri


Juliemar Cuevas-Hernandez

# Breeding American Oystercatchers

| US Atlantic and Gulf Coasts | Florida | Nature Coast | Cedar Key |
|---|---|---|---|
| 12,453 Birds | 2,800 Wintering Birds<br>458 Breeding Birds | 1,900 Wintering Birds<br>119 Breeding Birds | 1,600 Wintering Birds<br>16 Breeding Birds |

# Cedar Key Nesting

## 2007-2022

Hog Island Shell Rake

Derrick Key

McClamory Key

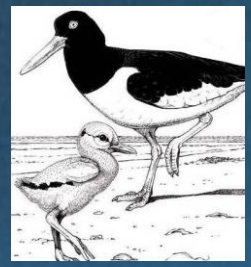
Rattlesnake Key

Gomez Keys

Airport Key

Dog Key

Corrigan's Reef



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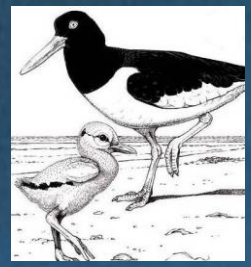


# Threats: Overwash


Primary threat to nest success along the Nature Coast

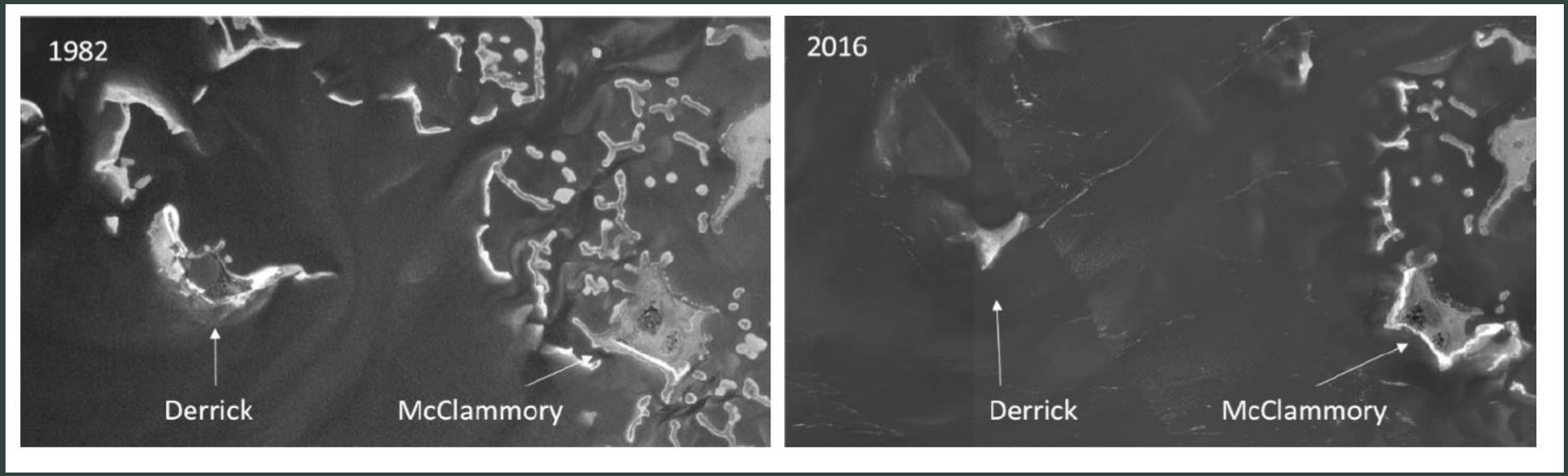
# Threats: Island Erosion

Derrick Key


10 Years


Primary threat to habitat availability along the Nature Coast

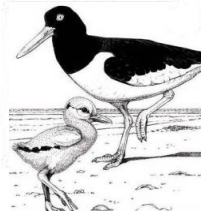
# Disappearing Islands



# Oystercatcher Research

Estuaries and Coasts
https://doi.org/10.1007/s12237-020-00811-3

## Loss of Coastal Islands Along Florida's Big Bend Region: Implications for Breeding American Oystercatchers



Nick Vitale[1] · Janell Brush[2] · Abby Powell[1,3]

Received: 27 January 2020 / Revised: 20 July 2020 / Accepted: 23 July 2020



USGS science for a changing world

FLORIDA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT

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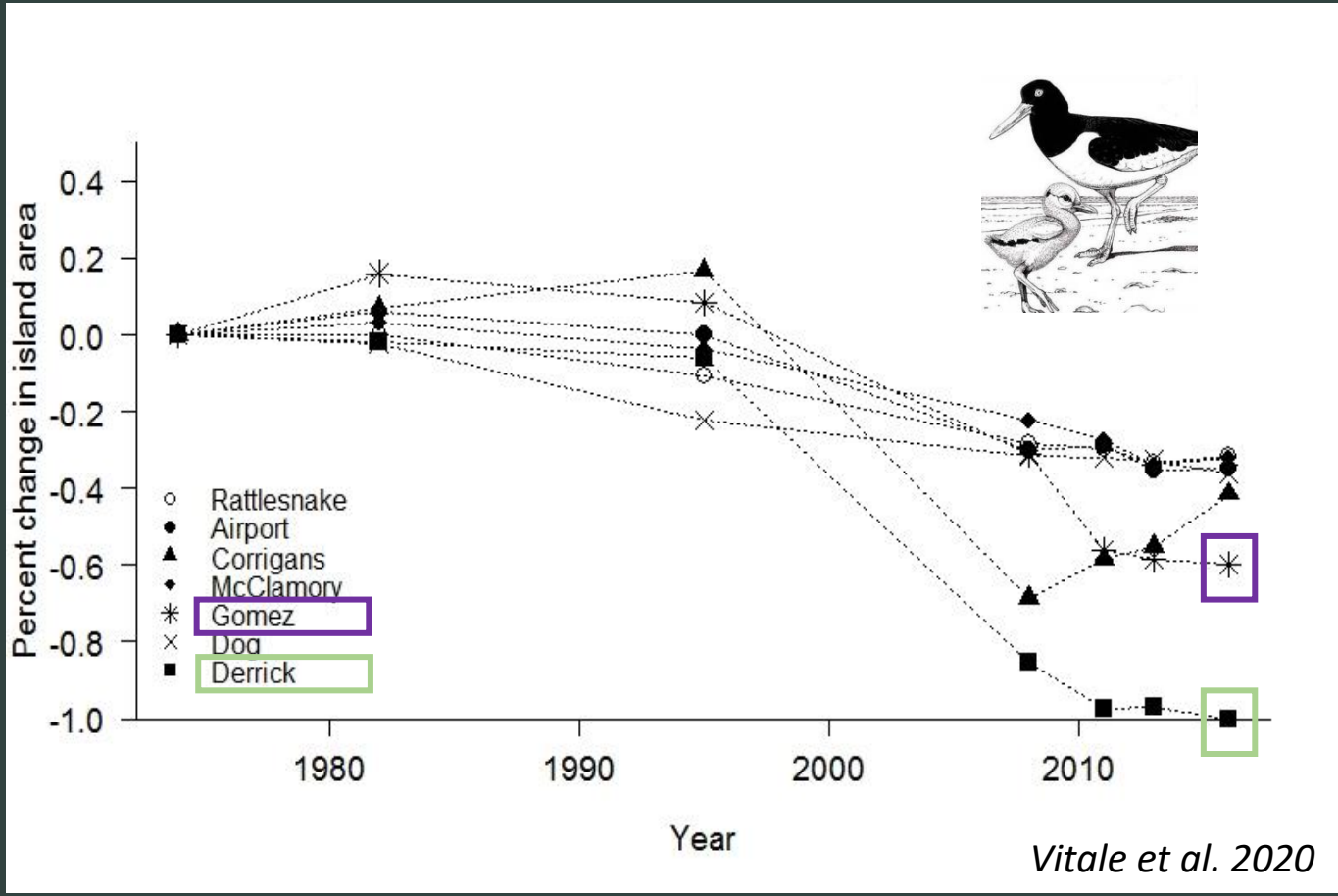
NATURE COAST BIOLOGICAL STATION

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

# Oyster Loss = Island Loss




*Vitale et al. 2020*

- Total area of nesting islands around Cedar Key decreased by 39% between 1974 and 2016
- 85% of this decrease was after 1995
- Reduction in extent of oyster reefs in the area

# Breeding American Oystercatchers at Gomez Key

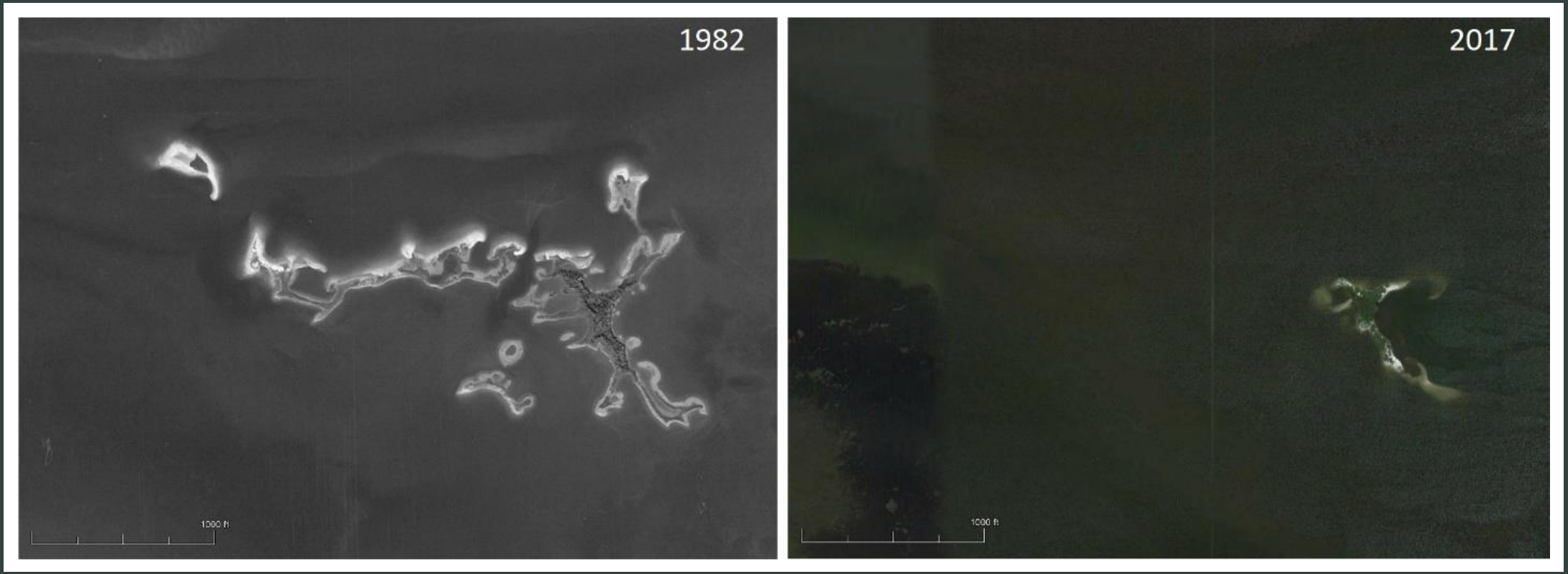
*2022 Metrics*

Cedar Key has the 5th largest concentration (16 breeding birds) of breeding oystercatchers in the state

- Gomez Key = 8 breeding birds
- Gomez Key = 0.75 chicks/pair

# Gomez Keys Habitat Enhancement

*Goal: Restore and conserve bird nesting and foraging habitat*




Natural Resource Damage Assessment and Restoration Program
Restoration Program

*Project Manager: Joe Marchionno (FWC/UF)*

# How do we fix this?

Habitat and Species Conservation
- Engineer
- Construction Planning & Design Manager
- Aquatic Habitat Conservation and Restoration

Wildlife Research
- Avian Research Scientist
- Restoration Project Manager

# Resilient Solutions for Gomez Key

## Using Natural and Nature Based Features (NNBF)

Gomez Key Ecosystem Mosaic

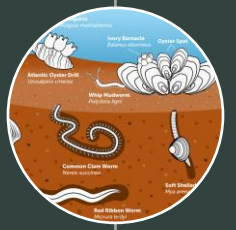
Nesting Habitat for oystercatchers

Food Resources for oystercatchers

Increase nesting area and elevation

Stabilize area and elevation

Increase oyster abundance



Support community

Shell/sand substrate

Living reef/breakwater

Low profile oyster recruiting materials

Aquatic Vegetation

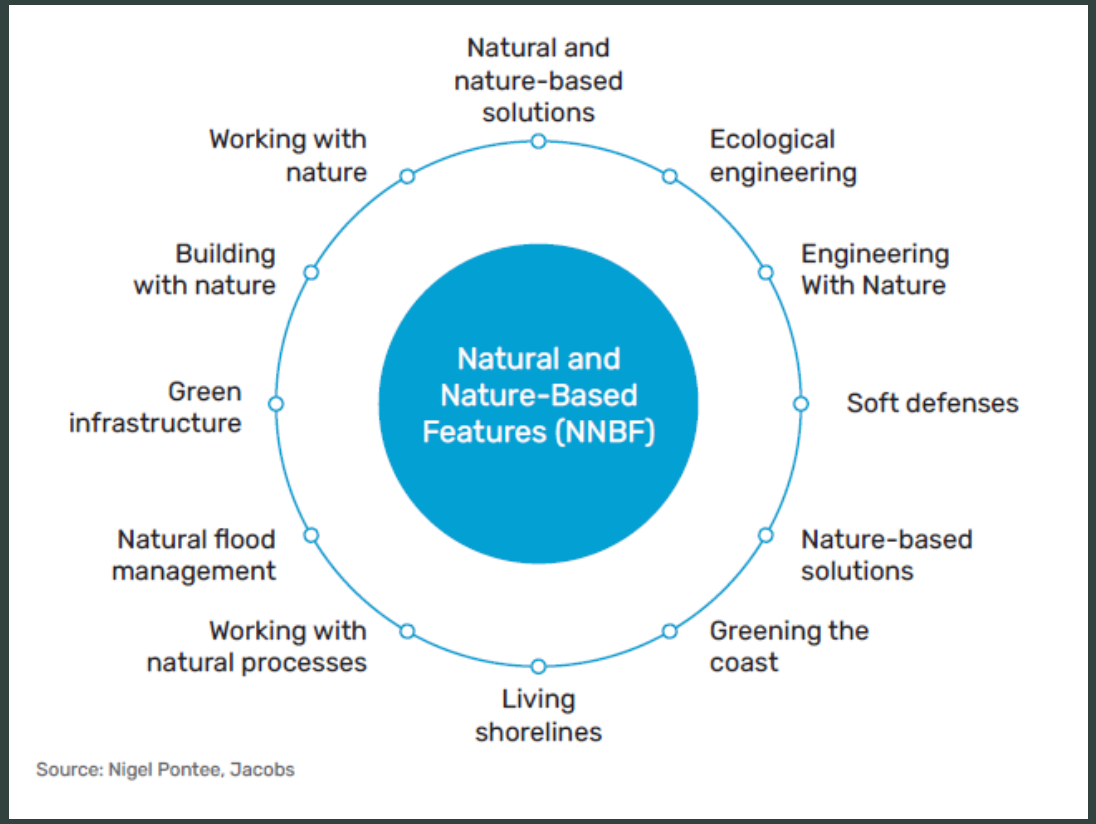
# Lone Cabbage Reef

*Lower Suwannee Estuary. High energy environment. NNBF = limestone oyster reef (intertidal living breakwater)*


We applied lessons learned from the Lone Cabbage Reef Project to the design of the nature-based feature breakwater we are proposing for Gomez Key:

- Added slope and features to reduce scour
- Maximize ecological benefits via water exchange to promote oyster growth
- Reduced limestone size to reduce oyster predation

# Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers



Source: Nigel Pontee, Jacobs

Natural Resource Damage Assessment and Restoration Program

**Restoration Program**

# Gomez Key Project Approval

August 2021

**RESTORATION IN FLORIDA TRUSTEE IMPLEMENTATION GROUP**

SARAH KETRON
Alternative Representative, Florida Department of Environmental Protection

GARETH G. LEONARD
Principal Representative, Florida Fish and Wildlife Conservation Commission

CHRISTOPHER D. DOLEY
Principal Representative, National Oceanic and Atmospheric Administration

MARY JOSIE BLANCHARD
Principal Representative, Department of the Interior

RONALD HOWARD
Alternate to Principal Representative, U.S. Department of Agriculture

MARY KAY LYNCH
Alternate to Principal Representative, U.S. Environmental Protection Agency

| | TASK |
|---|---|
| ✓ | Bathymetric and topographic survey |
| ✓ | Beach morphology assessment |
| ✓ | Geotechnical evaluation |
| ✓ | Wind data collection |
| ✓ | Wave data collection |
| ✓ | Environmental characterization |
| ✓ | Cultural resource assessment |
| ✓ | Determination of modeling domain |
| ✓ | Model production runs |
| ✓ | Concept design alternatives |
| ✓ | Draft design |
| | Pre-permit application meetings |
| | Final design |

# Gomez Keys


- State Sovereign Submerged Lands

# Gomez Key

- State Sovereign Submerged Lands
- Need to show sufficient upland interest (i.e., a lease agreement)
- FDEP as co-applicant because they are the landowner

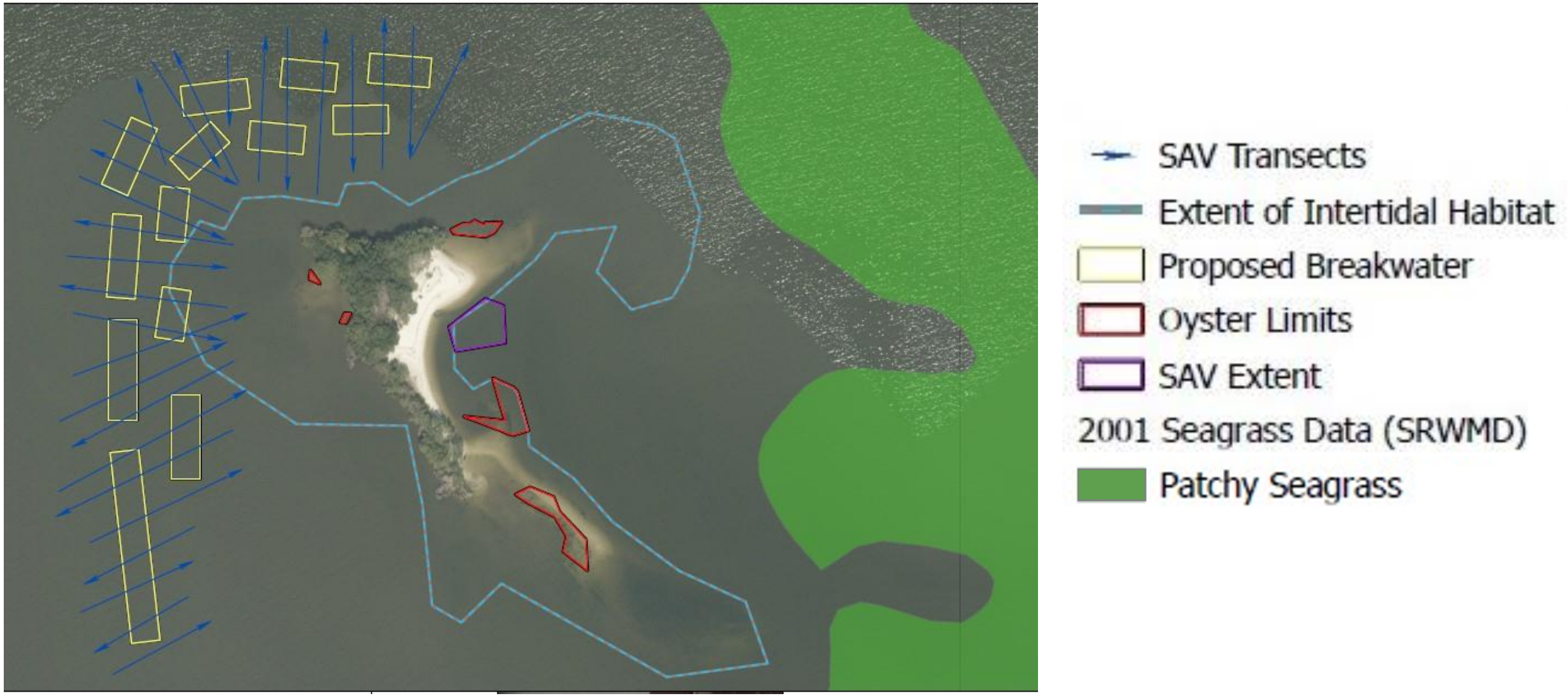
# Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers

"We do not advise installing breakwaters, filling in this area, or modifying the general area due to the impacts it would have on seagrass"

Natural Resource Damage Assessment and Restoration Program

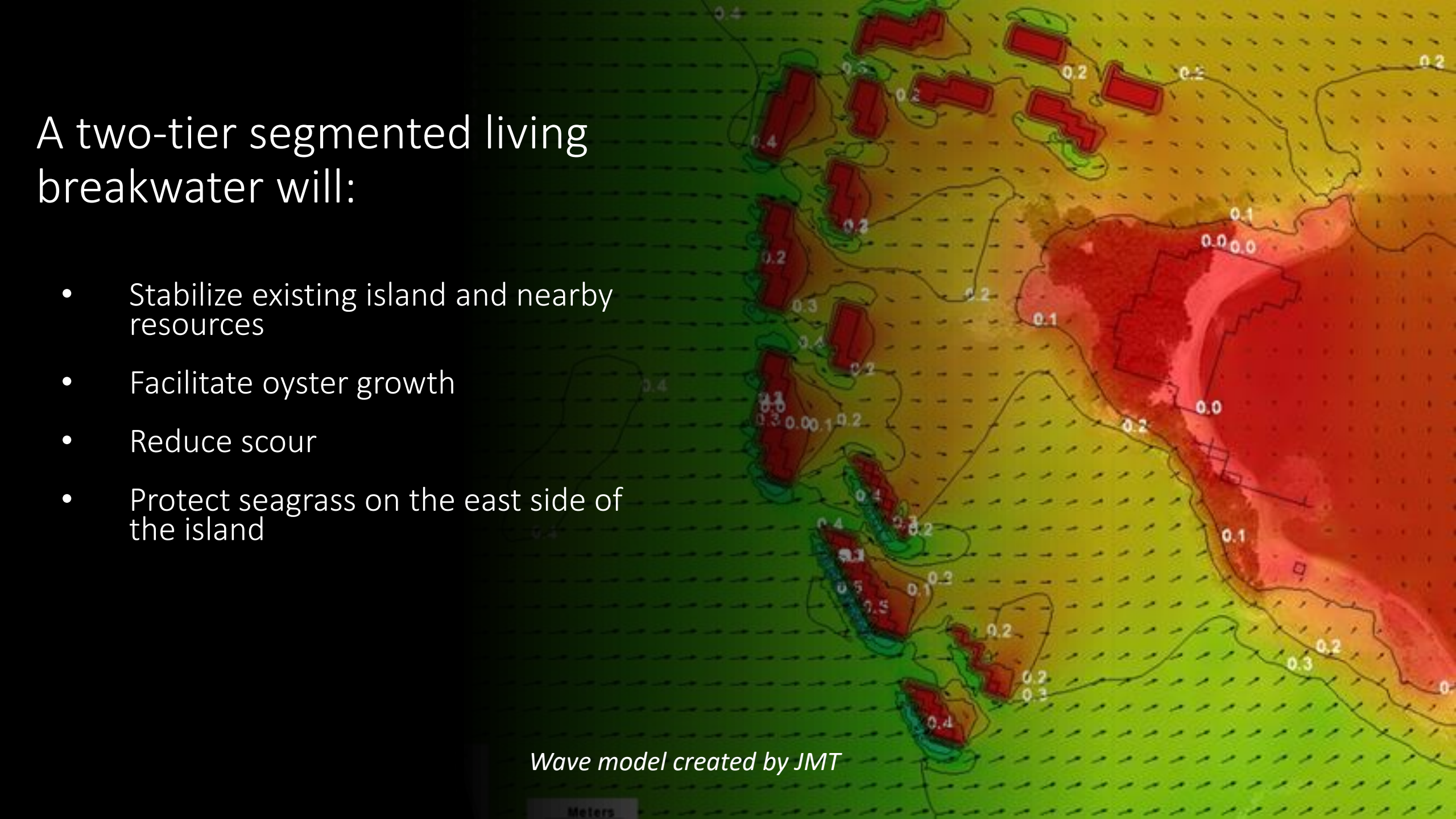
**Restoration Program**

Protecting Gomez will also protect the seagrass beds on the leeward side of Gomez from sedimentation and wave energy. No seagrass was found in proposed breakwater locations during a September 2022 resource survey performed by JMT Engineering.



# A two-tier segmented living breakwater will:

- Stabilize existing island and nearby resources
- Facilitate oyster growth
- Reduce scour
- Protect seagrass on the east side of the island

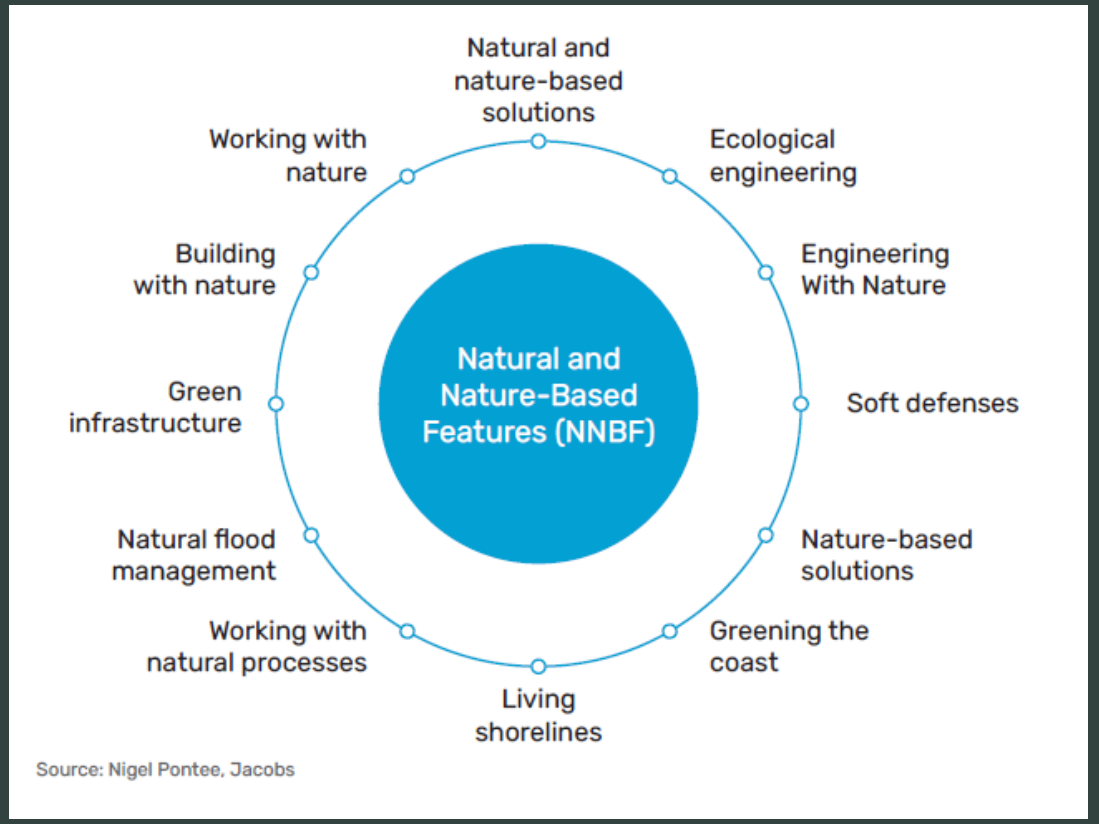



*Wave model created by JMT*

# Gomez Key Oyster Reef Expansion and Breakwaters for American Oystercatchers

Gomez Key Oyster Reef Expansion ~~and Breakwaters~~ for American Oystercatchers

Gomez Key Oyster Reef Expansion by Creating Island Resilience with Natural and Nature-based Features (NNBF) for American Oystercatchers




Natural Resource Damage Assessment and Restoration Program

**Restoration Program**

# Creating Island Resilience with Natural and Nature-based Features (NNBF)

- Ecosystem mosaic approach
  - Increase biodiversity
  - Consider multiple foundation species
  - Benefits to wildlife

REVERSING A RAPID DECLINE IN OYSTER REEFS: EFFECTS OF DURABLE SUBSTRATE ON OYSTER POPULATIONS, ELEVATIONS, AND AQUATIC BIRD COMMUNITY COMPOSITION

PETER FREDERICK,[1]* NICK VITALE,[1] BILL PINE,[1] JENNIFER SEAVEY[1,2] AND LESLIE STURMER[3]

[1]*Department of Wildlife Ecology and Conservation, 118 Newins-Ziegler Hall, University of Florida, Gainesville, FL 32611;* [2]*Shoals Marine Laboratory, School of Marine Science and Ocean Engineering, Morse Hall, 8 College Road Durham, University of New Hampshire, NH 03824;* [3]*Florida Sea Grant Extension, University of Florida, Cedar Key Marine Field Station 11350 SW 153rd Court, Cedar Key, FL 32625*

Modeling the Effects of Oyster Reefs and Breakwaters on Seagrass Growth

Author(s): Katharine A. Smith, Elizabeth W. North, Fengyan Shi, Shih-Nan Chen, Raleigh R. Hood, Evamaria W. Koch and Roger I. E. Newell

Source: *Estuaries and Coasts*, JULY 2009, Vol. 32, No. 4 (JULY 2009), pp. 748-757

Published by: Springer

Stable URL: https://www.jstor.org/stable/40663579

Engineering coastal structures to centrally embrace biodiversity☆

Burton C. Suedel [a,h], Jon Calabria [b,h,*], Matthew V. Bilskie [c,h], Kelsey Broich [e,h], S. Kyle McKay [f,h], Amanda S. Tritinger [a,h], C. Emily Dolatowski [b,h]

[a] *Engineer Research and Development Center, US Army Corps of Engineers, 3909 Halls Ferry Road, Vicksbu*
[b] *College Environment and Design, University of Georgia, 152 Jackson Street Building, Athens, GA, USA*
[c] *College of Engineering, University of Georgia, 0712C Boyd Graduate Research Building, 200 D.W. Brooks*
[d] *Odum School of Ecology, University of Georgia, Ecology Building, Rm. 194B, 140 E Green St, Athens, GA,*

2012

Biologically dominated engineered coastal breakwaters

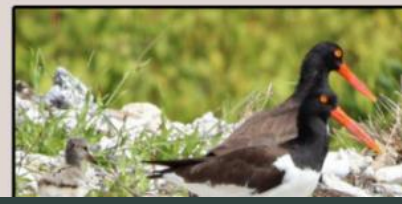
Jon David Risinger

*Louisiana State University and Agricultural and Mechanical College,* jdrisinger@gmail.com

Published by the Palm Beach County Department of Environmental Resources Management

**Environmental Success Story**
**American Oystercatchers Nesting in Lake Worth Lagoon**

By David Carson



It's May, which means we are well into bird nesting season. The Department is currently monitoring four pairs of American oystercatchers nesting in Lake Worth Lagoon. There are an estimated 1,500

# Creating Island Resilience with Natural and Nature-based Features (NNBF)

- Ecosystem mosaic approach
  - Increase biodiversity
  - Consider m… species
  - Benefits to…

"After multiple discussions…regarding the Gomez Key project, the consensus is that it does not align with our resource management objectives. The long-term effects of the breakwaters on surrounding seagrass beds is unknown but the potential of scouring from the breakwaters will have negative impacts."

REVERSING A RAPID DECLINE IN OYSTER REEFS: EFFECTS OF DURABLE SUBSTRATE ON OYSTER POPULATIONS, ELEVATIONS, AND AQUATIC BIRD COMMUNITY COMPOSITION

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…48-757

Published by: Springer

Stable URL: https://www.jstor.org/stable/40663…

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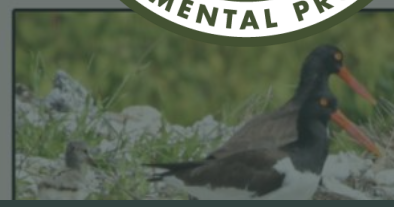
Publish… Environmental Resources Management

En… …tory

Am… …s

Nest… …Lagoon

By David Carson



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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

# Hurricane Idalia – Cat 3

August 30, 2023

# Restoration in the Nature Coast

## Restoration Needs

- Critical high-tide roosts
- Breeding habitats
  - Derek, Gomez, ???
- Oysters

## Uncertainties

- Support for future restoration projects to benefit oystercatchers
- Restricted tools for restoration
- No limestone breakwaters in aquatic preserves?

# Big Bend Estuarine Research Team














# To be Continued…

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*Joseph.Marchionno@myFWC.com*