Carlos Reef Phase II

Restoring the Heart of Texas' Coastal Bend

A permitted, shovel-ready, results-proven reef restoration—Carlos Reef Phase II is next to the highly successful Texas Parks and Wildlife Department's (TPWD) Carlos Phase I restoration project, which showed 2–4x the oyster growth of unrestored areas within 2 years. Because of its proximity to Carlos Phase I, Carlos Phase II is expected to yield visible results within 12 months, and measurable results within 24 months.

Courtesy of Galveston Bay Foundation

Oyster reefs provide three essential benefits to Texas bays: shoreline protection, biodiversity, and water filtration. Healthy reefs reduce wave energy, shelter more than 300 species, improve water clarity, support seagrass growth, and strengthen the coastal economies tied to fishing, birding, tourism, and recreation.

Texas has lost 70% of its historic reef acreage. Importantly, Texas retains an advantage over other states that have experienced acreage declines—we still have oyster larvae in our waters to enable successful reef restoration. **That window is closing; it is time to scale and accelerate reef restoration across the Texas coastal bay system.** Carlos II provides scale, speed, and demonstrated success.

CARLOS PHASE II is part of a larger 300-acre permitted site in the Mesquite Bay Complex and Sanctuary, which is closed to and protected from future oyster harvest. The Carlos Reef II project cost is $3 million, and Coastal Conservation Association (CCA) generously committed $1 million. Coastal Preservation and Restoration (CPR) is seeking private philanthropic partners to help close the remaining $2 million by year-end 2026—with construction to start and finish in 2027.

OVERVIEW	SCOPE	FUNDING
$3 Million	**70 Acres**	**$2 Million**
Total project cost with $1 million committed	of permitted oyster reef restoration	Additional private funding needed by year-end 2026

Why Oysters, Why Now?

If you love Texas bays—the wildlife, the wild coastline, the fishing, the seafood—oysters are why those things exist. A single oyster filters up to 50 gallons of water per day, removing nitrogen, sediment, and pollutants. Millions of them build the reef structures that shelter the juvenile redfish, shrimp, speckled trout, and blue crabs that define Texas coastal life. No healthy oyster reefs means no healthy bay ecosystem—no seagrasses, no marshes, no fisheries, no iconic Texas seafood.

WHY OYSTER REEF RESTORATION IS AN EXCEPTIONAL INVESTMENT
Funders routinely support projects where impact is unmeasurable, maintenance costs are high, or success is uncertain and decades away. Oyster reef restoration is different in nearly every way:

PROVEN SUCCESS With the right conditions and proven methods, oyster reef restoration is highly predictable. TPWD's Carlos Reef Phase I already proved it.	**TIME-SENSITIVE ADVANTAGE** Texas still has larvae. States that waited until their reefs were nearly gone face decades of slow, expensive recovery. We don't—yet.
SOLVABLE PROBLEM CPR's vision for Texas is 8,000 acres of reef restoration. $125M in private and public funding is needed to deliver strategic and impactful reef restoration that would complete 30% of this goal.	**EXCEPTIONAL ROI** 70 restored acres provide continuous water filtration, fishery nursery habitat, shoreline protection, and carbon sequestration—at zero ongoing cost.
FAST RESULTS Construction takes weeks, not years. Expected results are measurable within 12–24 months.	**IMPACT GROWS** Unlike buildings or equipment that depreciate, a restored reef grows larger and more productive every year.
NO MAINTENANCE Once built, reefs require no ongoing maintenance, only periodic monitoring.	**MEASURABLE IMPACT** Water filtration, biomass, and biodiversity are measurable. Soon we will be able to project CO_2 and nitrogen sequestration impact.

The Three Pillars of a Healthy Bay

The three most important habitats for healthy, vibrant, high-functioning coastal bays are oyster reefs, seagrasses, and salt marshes. Together they form the basis for the coastal bay ecosystem. Oyster reefs play a foundational role: they absorb wave energy, create the calm, clear water seagrasses need to thrive, and buffer the shoreline forces that erode marshes. Lose the oyster reefs, and the other two collapse. Restore them, and seagrasses and marshes grow and thrive. A restored reef system gives the bay ecosystem its best chance to recover.

Oyster Reefs THE FOUNDATION	Seagrasses NURSERY HABITAT	Salt Marshes SHORELINE SHIELD
• Filter up to 50 gal/water per oyster/day • Build 3-D reef structure & habitat • Shield seagrasses & marshes • Sequester carbon & nitrogen • Are nurseries for fish, shrimp & crabs	• Shelter juvenile fish & shrimp • Produce underwater oxygen • Stabilize sediment • Feed sea turtles & waterfowl • Depend on calm water oyster reefs create	• Sequester "blue carbon" • Provide nesting habitat for shorebirds • Cycle & filter nutrients • Are protected from wave erosion by reefs

Texas: The Crisis—and the Opportunity

Texas once had 88,000 acres of oyster reefs largely used for harvest. Today, only 25,000 harvest acres remain, with total reef acreage estimated at about 40,000 acres. Historic losses resulted from overharvest, drought, pollution, and the compounding damage of Hurricanes Ike and Harvey. Texas has fallen from the second-largest oyster-producing state in the nation to fourth. Industry harvest decline is not inevitable. It is the direct result of the continued destruction of the natural resource.

But here is what makes Texas different—and what makes this moment so critical. Chesapeake Bay lost 98% of its oyster biomass before it began serious restoration. Its comeback took four decades of substantial public and private investment. New York Harbor has its "Billion Oyster" program to bring its oysters back from extinction. The Apalachicola Bay oyster population completely collapsed in 2020. These are cautionary tales. Texas is not there yet—but the window is narrowing.

The decisive advantage: Texas still has the larvae. Millions of oyster larvae are in our bay waters right now, searching for substrate to settle on. We are not building from near zero—instead we are giving nature a helping hand—meaning faster recovery, lower cost, and far higher success rates. Every season we delay, larvae drift and die without a reef to settle on. This is a solvable problem. The question is whether we act while the window is still open.

88K→25K	From #2 → #4	<2,000	40,000
Harvest reef acres lost since 1893[1]	Texas oyster harvest ranking[2]	Acres ever restored[3]	Total reef acres still remaining—more than almost anywhere

Why Carlos Reef—Why Now?

Carlos Reef is the westernmost baffle reef of the 56,688-acre Mesquite Bay Complex and Sanctuary—a protected sanctuary closed to commercial harvest since 2022. As a historic baffle reef, it once managed the area's water flow, absorbing wave energy, preventing shoreline erosion, and creating the complex habitat on which the entire web of bay life depended. Its loss is severely and negatively impacting the surrounding land, water, habitat, and the entire ecosystem.

The adjacent Carlos I project is the proof point for Carlos II's success. TPWD spent $2.45M to place 13,000 cubic yards of cultch (the shell substrate larvae need to settle and grow) across 70 acres. Post-restoration monitoring shows the restored area dramatically outperforming unrestored segments with 2x–4x comparative growth—dominated by juvenile oysters actively self-regenerating. The science is confirmed. The Army Corps permit for Phase II is in hand.

SHOVEL-READY 70 permitted acres under existing Army Corps of Engineers permit. No permitting delays.	**IDEAL CONDITIONS** Protected from harvest since 2022. Larvae present. Perfect for rapid self-regeneration.
PROVEN MODEL FOR SUCCESS Carlos I monitoring shows restored reef dramatically outperforming nearby natural reef. This works.	**FAST, VISIBLE RESULTS** Construction takes 3 weeks to 6 months. Expected visible results within 12 months and measurable results within 24 months.
FUNDED TO START $3M total cost. CCA committed $1M. CPR seeks to help fund the remaining $2M by year-end 2026.	**LONG-TERM VISION** First chapter of CPR's vision for Texas: 8,000 acres across Texas coastal bays, including 2,500 acres of strategic restoration—the largest reef restoration in U.S. history.[4]

What Your Investment Restores

Unlike most capital investments, the impact of your donation grows as the reef grows. A healthy one-acre reef can filter 5 million gallons of water per day, improving water quality even as it begins to grow.[5] There is no depreciation. No maintenance budget. Just a reef doing what reefs have always done.

WATER QUALITY Carlos II restores 70 acres of continuous water filtration—removing nitrogen, sediment, and pollutants at no ongoing cost. A healthy 50-acre reef can filter 250 million gallons of water daily, about the same volume of wastewater that a single City of Houston sewage plant processes daily.[6]	**THE GULF FISHERY** Redfish, speckled trout, flounder, shrimp, and blue crabs begin their lives in these bay habitats. Restore the reef—restore the nursery that feeds the Gulf. The bays don't just support the Gulf fishery. They ARE the Gulf fishery.
SHORELINE PROTECTION Restored reefs absorb wave energy and prevent tidal breaches that cause saltwater intrusion, marsh plant mortality, and shoreline erosion—protecting ranches, coastal communities, and public lands alike.	**WILDLIFE** The Mesquite Bay Complex supports 19 threatened or endangered species[8]—including the endangered Whooping Crane. An estimated 2 billion birds migrate through Texas each year.[9] Oyster reefs support 300 species of marine life.
CARBON & NITROGEN SEQUESTRATION Oyster reefs are measurable coastal climate solutions, providing carbon and nitrogen sequestration benefits at scale.[7]	**TEXAS HERITAGE** Texas oysters, Gulf shrimp, and redfish are not just food. They are our history—starting with the Karankawa and woven into our coastal identity today. Restoring the natural resource means restoring the harvest.

Project Timeline

Funding commitments secured	By year-end 2026
Final construction planning	Q1 2027
Cultch/material mobilization	Q2 2027
Reef construction	Q2–Q3 2027
Post-construction monitoring begins	Q3/Q4 2027
Year 1 donor performance report	2028

Monitoring & Accountability

Carlos Phase II will be subject to rigorous, science-based monitoring coordinated by the Mesquite Bay Complex Workgroup—consistent with Phase I protocols. Key metrics include oyster density and recruitment, reef vertical relief (the key resilience indicator), live oyster cover, water clarity, nekton use (shrimp, crabs, and juvenile fish), and adjacent marsh and shoreline condition. The Year 1 performance report to donors is targeted for 2028.

About CPR and Our Vision Ahead

CPR is a Texas 501(c)(3) founded in 2025 to preserve and restore Texas Gulf Coast bays and estuaries from Galveston to Corpus Christi. We exist to help catalyze and accelerate large-scale restorations across the state and to compel the shift to sustainable harvest methods to ensure the vibrancy of our Texas coastal bays. This work will protect and restore ecosystems while supporting Texas jobs, the oyster industry, and a foundational piece of Texas cultural heritage. CPR partners with coastal nonprofits and state-level organizations already doing great work in this area to help advance their missions. Protecting and restoring oyster reefs is not anti-industry; it is absolutely necessary to protect the economic benefits, jobs, quality of life, and memories of a lifetime that a healthy coastal bay system creates.

Raising awareness to and advocating for this urgent and misunderstood issue is core to CPR's mission. In less than one year, CPR has generated 26+ major media features and 337 million impressions; engaged 200+ civic leaders and potential partners; and hosted three reef tours. Working alongside CCA, FlatsWorthy, TPWD, and Texas Parks and Wildlife Foundation (TPWF), CPR helped support voluntary, market-based efforts that reduce pressure on public reefs—permanently retiring nearly 30% of Texas's outstanding commercial oyster licenses and removing 148 boats from public reefs.

Carlos Reef is part of a much larger story. **CPR's vision for Texas: 8,000 acres of restored oyster reef.** Some of this will be done by restorations on private leases, thanks to TPWD's reopening of this program. A $125 million investment has the potential to fulfill 30% of this goal, or 2,500 acres, and is an investment in the ecological and economic future of the Texas coast. 2,500 acres will be the largest oyster reef restoration in U.S. history to date.[4] With our coastal conservation partners, CPR has identified a portfolio of high-impact, high-ROI projects from Coastal Bend to Matagorda and Lavaca to Galveston Bay.
Let's make history—starting today—together.

Courtesy of Keith Miears

Expert Coalition

Carlos Reef Phase II is supported by a proven, science-driven, collaborative team, and contributors:

Aransas National Wildlife Refuge (ANWR)	FlatsWorthy	Texas Parks & Wildlife Department (TPWD)
Coastal Bend Bays & Estuaries Program (CBBEP)	The Nature Conservancy (TNC)	Texas Parks & Wildlife Foundation (TPWF)
Coastal Conservation Association – Texas (CCA)	Texas A&M Corpus Christi Harte Research Institute	The University of Texas at Austin Marine Science Institute – Mission-Aransas National Estuarine Research Reserve
Coastal Preservation and Restoration (CPR)	Texas General Land Office (TGLO)	

How to Invest in Carlos Reef Phase II

CPR is seeking donors at all levels to help close the remaining $2 million needed to fund this $3 million project by year-end 2026. CPR accepts gifts of stock. All gifts are fully tax-deductible.

The larvae are in the water. The permit is in hand. Phase I has proven that the model works. Texas has a narrowing window to do what no other state has done—restore at scale, quickly, while the biology is still on our side. **Early donors in Carlos Reef Phase II are not just restoring a reef. They are helping launch a broader Texas restoration movement.**

To Invest or Learn More:

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Selected Sources & Technical Basis

1. ~88,000 acres were identified in an 1893 U.S. Fisheries Survey of Texas oyster reefs; these were largely harvested reefs. Texas Parks and Wildlife estimates that currently ~25,000 harvest reef acres remain. Freese and Nichols and others have estimated that current total reef acreage in the Texas bay system (harvest plus habitat) at ~40K-41K acres (Dec. 2025 report).
2. Texas oyster harvest ranking. NOAA Fisheries of the United States, annual commercial fisheries statistics.
3. Restored acreage estimate. Joe Fox recorded <1,000 acres restored; <2,000 used to be conservative.
4. *Oyster Restoration in the Chesapeake.* (2025). The Nature Conservancy. https://www.nature.org/en-us/about-us/where-we-work/priority-landscapes/chesapeake-bay/chesapeake-oyster-restoration/
5. NOAA Fisheries, *Sustainable Pacific Oyster Farming.* https://www.fisheries.noaa.gov/feature-story/sustainable-pacific-oyster-farming
6. City of Houston, FY2026-FY2030 *Adopted Capital Improvement Plan, Wastewater Treatment Facilities.* https://www.houstontx.gov/cip/26cipadopt/e_wastewater.pdf
7. Carbon & nitrogen sequestration. Fodrie et al. (2017), Proceedings of the Royal Society B; zu Ermgassen et al. (2013), Marine Ecology Progress Series.
8. Threatened & endangered species, Mesquite Bay Complex. USFWS Aransas NWR species lists; TPWD Wildlife Diversity Program.
9. Migratory bird estimate. Texas Parks & Wildlife Department; Cornell Lab of Ornithology, eBird migration data.
10. Carlos Reef Phase I. Texas Parks & Wildlife Department /Mesquite Bay Workgroup report: 2024, ~70 acres, ~13,000 cu. yds. cultch placed. Monitoring ongoing.
11. Army Corps permit. Mesquite Bay Workgroup. Permit number available upon request.
12. Global oyster reef loss. Beck et al. (2011). BioScience 61(2): 107–116. ~85% of historic reef acreage lost globally.
13. Chesapeake Bay 2025 milestone. MD Dept. of Natural Resources & VA Marine Resources Commission annual reports; Chesapeake Bay Foundation.
14. Hurricane Ike/Harvey losses. TPWD Coastal Fisheries Division assessment reports (2009, 2018).
15. Reef resilience & vertical structure. Colden & Lipcius (2015). Marine Ecology Progress Series 519. Schulte et al. (2009). Science 325.
16. Mesquite Bay Complex closure. TPWD Coastal Fisheries Division; Texas Legislature, 87th Session (2021).

This document is intended for philanthropic and stakeholder audiences. Statistics and estimates are drawn from published scientific literature, government agency data, and project records. CPR welcomes questions about any factual claims. Contact: sarnold@cprtexas.org