

PROJECT DESCRIPTION

LEVY COUNTY

Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration (CLEAR Initiative - Coastal Levy Economic and Reef Restoration)



PROJECT NO. 12-4

Overview and Location

The Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration (CLEAR) project is a large-scale, science-based restoration initiative that integrates habitat restoration, sustainable aquaculture, and cultural heritage preservation to strengthen the economic and environmental resilience of Levy County's Gulf Coast communities.

Centered on Corrigan's Reef near Cedar Key, with linked working waterfront and aquaculture improvements in Yankeetown and Inglis, the project will restore approximately 25–35 acres of oyster reef habitat within the Nature Coast Seagrasses Aquatic Preserve. These restored reefs will enhance water quality, stabilize shorelines, and increase fisheries productivity while providing natural infrastructure to buffer against storm surge and sea level rise.

The project area lies within the Lower Suwannee, Waccasassa, and Withlacoochee Estuarine System, one of the most ecologically intact watersheds in the Gulf of Mexico. It supports critical habitats—including tidal marshes, oyster bars, and seagrass beds—that sustain the livelihoods of local shellfish industries. Restoration at Corrigan's Reef will reconnect degraded estuarine habitats and bolster aquaculture operations that are vital to Levy County's working waterfront economy.

By combining nature-based restoration with workforce training, cultural preservation, and community engagement, CLEAR will create a model for sustainable coastal management that revitalizes Levy County's maritime economy while conserving its unique natural and cultural heritage

Need and Justification

Levy County's Gulf Coast communities - Cedar Key, Yankeetown, and Inglis - have long depended on natural resources and the health of coastal ecosystems for their economic survival, cultural identity, and community resilience. These towns form the heart of Florida's Nature Coast region, one of the most environmentally intact yet economically vulnerable areas of the Gulf Coast. Despite its pristine condition, the region faces accelerating environmental and economic pressures, including storm damage, declining shellfish populations, and infrastructure limitations that restrict sustainable aquaculture and tourism growth

The need for restoration is urgent. Corrigan’s Reef, once a thriving oyster habitat supporting local fisheries and water quality, has experienced extensive degradation from cumulative storm impacts, altered hydrology, and sedimentation. Successive hurricanes—including Idalia (2023) and Helene (2024)—compounded losses in the shellfish industry, with statewide aquaculture damages estimated at \$90–100 million. Local oystermen and clam farmers have reported reduced productivity and habitat instability, threatening the viability of Levy County’s working waterfront economy.

The Nature Coast’s ecological health is directly tied to its economic base. In 2023, Levy County’s GDP totaled \$1.1 billion, with \$219.9 million generated by agriculture, forestry, fishing, and hunting sectors. However, these industries remain highly sensitive to environmental decline. Restoration of Corrigan’s Reef will improve water quality, expand nursery habitat, and strengthen storm resilience—directly safeguarding jobs and infrastructure tied to coastal production.

Beyond ecological restoration, this project fulfills a broader social and economic necessity. Coastal communities in Levy County are designated as fiscally constrained, with limited tax bases and reliance on resource-based industries. The population—aging and increasingly dependent on fixed incomes—faces limited employment opportunities. Restoration and aquaculture expansion create direct and indirect jobs, support local workforce training, and foster tourism linked to the County’s natural and cultural heritage.

From an environmental standpoint, the project addresses key stressors: water quality degradation, shoreline erosion, loss of benthic habitat, and reduced fisheries productivity. Oyster reefs act as natural water filters and wave buffers, improving water clarity, reducing nutrient loads, and stabilizing shorelines. The restoration of Corrigan’s Reef within the Nature Coast Seagrasses Aquatic Preserve will provide measurable improvements to habitat complexity, biodiversity, and ecosystem resilience, consistent with the Gulf Coast Ecosystem Restoration Council’s Comprehensive Plan Goals 1–5.

Culturally, this project restores a way of life. The Nature Coast’s identity—rooted in fishing, aquaculture, and community stewardship—depends on the sustainable use of marine resources. Oysters, clams, crabs, and fish once defined local commerce and cuisine, and restoring these natural assets revitalizes not just the ecosystem but the culture it sustains. The initiative strengthens the historical connection between people and the gulf, echoing centuries of maritime tradition that remain essential to Levy County’s sense of place and economic identity.

In sum, the CLEAR project responds to a clearly demonstrated environmental and economic need. It restores ecosystem function, reduces vulnerability to future storms, supports aquaculture-dependent livelihoods, and preserves the cultural heritage of Levy County’s working waterfronts. The scale of intervention—anchored at Corrigan’s Reef and connected across Cedar Key, Yankeetown, and Inglis—is essential to achieve lasting, regional resilience and ensure the continued prosperity of Florida’s Nature Coast.

Purpose and Objectives

The purpose of the Levy County Coastal Working Waterfront: Cultural Heritage, Economic

Development, and Reef Restoration project is to restore critical oyster reef and estuarine habitat at Corrigan's Reef while revitalizing the economic and cultural foundations of Levy County's Gulf Coast communities—Cedar Key, Yankeetown, and Inglis. The project integrates ecosystem restoration, aquaculture development, workforce training, and cultural preservation into a unified initiative that strengthens the long-term resilience of the region's natural resources and working waterfront economy.

The project's objectives are to:

1. Restore and enhance coastal habitat: Reconstruct approximately 25–35 acres of oyster reef habitat within the Nature Coast Seagrasses Aquatic Preserve to improve ecosystem function, promote biodiversity, and stabilize shorelines.
2. Improve water quality and estuarine health: Increase filtration capacity and water clarity through oyster restoration, reducing nutrient loads and supporting seagrass recovery.
3. Support local aquaculture and fisheries: Strengthen shellfish industries in Cedar Key, Yankeetown, and Inglis by improving habitat productivity and developing community-based aquaculture programs that employ local residents.
4. Enhance community resilience: Utilize living shoreline and reef infrastructure to reduce storm surge and coastal erosion, protecting coastal property and public infrastructure.
5. Preserve and promote cultural heritage: Celebrate the maritime traditions and coastal heritage of Levy County through interpretation and local partnerships that connect residents to the restoration process.
6. Foster economic growth and workforce capacity: Create sustainable jobs through project construction, monitoring, and long-term aquaculture operations while expanding technical training through UF/IFAS and the Florida Master Naturalist Program.
7. Advance science-based coastal management: Employ best available science and adaptive management to ensure restoration success, guided by data collected through the UF/IFAS Nature Coast Biological Station and ongoing environmental monitoring.

Collectively, these objectives will restore natural ecosystem functions, strengthen local economies, and preserve the cultural integrity of Levy County's working waterfronts. The project fulfills multiple goals of the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan, including the restoration and conservation of habitat, improvement of water quality, replenishment of living coastal resources, enhancement of community resilience, and revitalization of the Gulf economy.

Project Components

The CLEAR project consists of three integrated phases that collectively restore degraded reef habitat, strengthen local economies, and build workforce capacity across Levy County's coastal communities.

Phase 1: Launch Phase (Years 1–2)

This phase establishes the foundation for project implementation, data collection, and workforce mobilization.

- Develop the Levy County Oyster and Reef Management Plan to identify priority restoration sites within Corrigan's Reef, substrate types, and adaptive management strategies based upon previous restoration success like Lone Cabbage.
- Secure environmental permits and regulatory approvals for restoration activities.
- Gather baseline ecological and economic data, including oyster density, water quality, fisheries activity, and business impacts.
- Initiate partnerships with the Cedar Key Oystermen's Association, Shellfish Industries of Yankeetown and Inglis, and UF/IFAS to coordinate workforce training and certification through Florida Sea Grant's Living Shoreline and Marine Contractor programs.
- Establish procurement systems and launch the County's Request for Proposals (RFP) process to ensure transparent selection of qualified restoration contractors and local suppliers.

Phase 2: Mature Phase (Years 3–5)

This phase focuses on full-scale reef construction, adaptive management, and economic diversification.

- Deploy approximately 25–35 acres of oyster reef substrate using locally appropriate materials such as dolomite limestone and Jute Reinforced Calcium Sulfoaluminate (JR-CSA) Reef Panels, as well as limerock cobbles where appropriate.
- Employ local residents in reef fabrication, deployment, and monitoring activities, emphasizing hiring from fishing and aquaculture backgrounds.
- Expand community-based aquaculture and restoration workforce programs to sustain long-term employment opportunities.
- Implement small-business assistance programs to diversify coastal enterprises, including ecotourism, seafood marketing, and restoration services.
- Conduct continuous monitoring of reef performance, water quality, and fisheries recovery using UF/IFAS and FWC methodologies.

Phase 3: Sustain/Scale Phase (Years 6–8)

The final phase ensures sustainability, replication, and integration into broader Gulf restoration strategies.

- Update and expand the Levy County Oyster and Reef Management Plan based on results and lessons learned.
- Evaluate the ecological, economic, and cultural benefits of restoration, including increases in fish catch rates, visitor activity, and aquaculture productivity.
- Develop financial and operational strategies to sustain reef maintenance, workforce employment, and local business growth beyond the project period.
- Share project outcomes regionally to advance the Gulf Consortium's goals of restoring habitat, supporting the economy, and strengthening coastal resilience.

Contributions to the Overall Economic and Ecological Recovery of the Gulf

The Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration project directly advances the Gulf Coast Ecosystem Restoration Council's five Comprehensive Plan goals by restoring key habitats, strengthening local economies, and enhancing community resilience in one of the most ecologically significant and economically vulnerable areas of Florida's Nature Coast region.

Ecologically, the restoration of approximately 25–35 acres of oyster reef at Corrigan's Reef will reestablish critical estuarine habitat that supports diverse marine life and improves overall water quality. Oysters are ecosystem engineers that filter nutrients, increase water clarity, and stabilize sediments, creating conditions necessary for the recovery of seagrasses and nearshore fish populations. These restored reefs will enhance the productivity of the Nature Coast Seagrasses Aquatic Preserve, providing essential nursery habitat for recreational and commercial fisheries that contribute to Gulf-wide biodiversity and seafood production.

By improving water quality and habitat integrity, the project also contributes to long-term resilience against climate-driven impacts such as storm surge, sea-level rise, and coastal erosion. Living reef structures act as natural breakwaters, dissipating wave energy and protecting shorelines, public infrastructure, and private property. This nature-based approach supports the Gulf-wide strategy of using ecosystem restoration to strengthen coastal defenses while maintaining ecological function.

Economically, the project revitalizes working waterfronts in Cedar Key, Yankeetown, and Inglis—communities historically dependent on shellfish aquaculture, commercial fishing, and maritime trades. The restored reef and associated aquaculture expansion will generate employment in reef construction, monitoring, and shellfish production, with an emphasis on hiring local residents. Increased seafood yields, enhanced tourism, and restored recreational fisheries will stimulate sustainable economic growth across multiple sectors.

This project also supports Gulf restoration by fostering regional partnerships that link science, community participation, and workforce development. Through collaboration with UF/IFAS, Florida Sea Grant, the Cedar Key Oystermen's Association, and the Shellfish Industries of Yankeetown and Inglis, the initiative builds technical capacity and knowledge transfer that benefit restoration efforts across the broader Gulf of Mexico.

Culturally, the project restores the maritime traditions and identity of Florida's Nature Coast—where coastal livelihoods and stewardship are intertwined. Reviving this heritage reinforces community resilience, public engagement, and long-term stewardship of restored habitats.

By integrating ecological restoration, workforce training, aquaculture innovation, and heritage-based economic renewal, CLEAR serves as a model for sustainable Gulf recovery—demonstrating that ecological resilience and economic vitality are mutually reinforcing outcomes essential to the enduring health of the Gulf Coast.

Eligibility and Statutory Requirements

The Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration (CLEAR) project meets multiple eligible activity categories authorized under the RESTORE Act (Public Law 112-141, Section 1604(3)). The project integrates planning, habitat restoration, and economic revitalization in a fiscally constrained Gulf Coast county with long-standing dependence on marine resources.

The proposed project is consistent with, and addresses, the following RESTORE Act eligible activities:

- Eligible Activity 1: Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region (primary)
- Eligible Activity 2: Mitigation of damage to fish, wildlife, and natural resources
- Eligible Activity 4: Workforce development and job creation.

Comprehensive Plans Goals and Objectives

The Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration (CLEAR) project aligns with and advances all five primary goals and multiple objectives identified in the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan. Through its integrated focus on habitat restoration, economic revitalization, and community resilience, the project demonstrates a balanced approach to ecological recovery and sustainable development across Florida's Nature Coast region.

This project is consistent with, and addresses, the following Comprehensive Plan Goals:

- Goal 3: Replenish and Protect Living Coastal and Marine Resources (primary)
- Goal 1: Restore and Conserve Habitat
- Goal 4: Enhance Community Resilience
- Goal 5: Restore and Revitalize the Gulf Economy.

This project is consistent with, and addresses, the following Comprehensive Plan Objectives:

- Objective 3: Protect and Restore Living Coastal and Marine Resources (primary)
- Objective 1: Restore, Enhance, and Protect Habitats
- Objective 5: Promote Community Resilience Consortium Objective 8: Restore, Diversify, and Revitalize the Gulf Economy with Economic and
- Environmental Restoration Projects.

Implementing Entities

The Levy County Board of County Commissioners (BoCC) will serve as the sole implementing entity and fiscal agent for the Levy County Coastal Working Waterfront: Cultural Heritage, Economic Development, and Reef Restoration (CLEAR) project. The BoCC will oversee all aspects of project management, procurement, permitting, reporting, and compliance in accordance with the RESTORE Act, 2 CFR Part 200 Uniform Guidance, and U.S. Treasury regulations.

Levy County will coordinate directly with federal and state regulatory agencies—including the U.S. Army Corps of Engineers (USACE), Florida Department of Environmental Protection (FDEP), and Florida Fish and Wildlife Conservation Commission (FWC) to ensure all required environmental permits and consultations are completed prior to implementation.

The County will issue a Request for Proposals (RFP) to competitively procure qualified contractors, engineers, and environmental specialists for reef construction, monitoring, and workforce training activities. Preference will be given to firms and vendors with proven success in coastal restoration and demonstrated ability to secure and maintain necessary state and federal permits.

To ensure technical accuracy and workforce development, Levy County will collaborate with UF/IFAS Nature Coast Biological Station and Florida Sea Grant for ecological monitoring, data management, and training of local residents in restoration and aquaculture practices. The County will also coordinate with the Cedar Key Oystermen's Association and Shellfish Industries of Yankeetown and Inglis to align restoration efforts with existing aquaculture operations and to promote employment of local workers.

All project contracts, reporting, and performance metrics will be administered through the Levy County Grants and RESTORE Program Office, ensuring fiscal integrity, compliance, and transparency throughout the five-year project term.

Best Available Science and Feasibility Assessment

The design and implementation of the CLEAR project are grounded in over a decade of peer-reviewed research, regional pilot testing, and site-specific monitoring that collectively demonstrate the technical feasibility and ecological effectiveness of oyster reef and estuarine restoration in Levy County's coastal waters.

Extensive studies conducted in Florida's Nature Coast region (Fredrick et al., 2016; Johnson et al., 2019; Aufmuth et al., 2025; Casteel et al., 2025) confirm that Eastern oysters (*Crassostrea virginica*) can be successfully re-established where stable substrates are deployed at appropriate elevations within the tidal frame and salinity range. Pilot deployments at Corrigan's Reef have verified these findings, showing strong oyster recruitment and survival even after recent major hurricanes (Idalia and Helene). Reef panels constructed of dolomite limestone, limerock, and Jute Reinforced Calcium Sulfoaluminate (JR-CSA) have proven resilient to wave energy and storm surge, confirming their long-term suitability for restoration at scale

The project also draws from research emphasizing that community-driven priorities and locally relevant socioeconomic conditions should guide restoration planning (Pascual et al., 2021; Obura et al., 2021). Incorporating local shellfish industries, oystermen, and aquaculture operators ensures that restoration aligns with both ecological and economic sustainability objectives.

Feasibility is further supported by evidence of high natural spat recruitment in the Nature Coast region, which accelerates self-recruitment and natural reef expansion following initial

construction. The presence of stable salinity regimes, low incidence of harmful algal blooms, and extensive surrounding conservation lands enhance the likelihood of sustained ecological success.

From an economic and operational standpoint, the project leverages the County's existing infrastructure and partnerships to reduce implementation risks. Training programs through UF/IFAS and Florida Sea Grant build workforce capacity, ensuring a skilled local labor pool for reef construction and monitoring. Procurement through an RFP process will ensure the use of qualified contractors experienced in coastal restoration and compliance with all environmental and permitting requirements.

Collectively, the CLEAR project represents a scientifically validated, technically feasible, and community-supported initiative that employs best available science to restore habitat, improve water quality, and create sustainable economic opportunities for Levy County's working waterfront communities.

Risks and Uncertainties

Any large-scale oyster and reef restoration initiative faces inherent environmental and operational risks. For CLEAR, the most significant environmental uncertainties include changes in hydrology, hurricanes, harmful algal blooms, droughts, and variable salinity levels. Pilot deployments at Corrigan's Reef have shown that engineered reef panels and limestone substrate are highly resilient to storm conditions, surviving both Hurricanes Idalia and Helene with limited damage. Nonetheless, tropical systems remain a recurring threat, and all construction schedules will be seasonally adjusted to minimize exposure during peak storm periods.

The Nature Coast region has historically experienced fewer harmful algal blooms than other Florida coastlines, making the risk of bloom-induced mortality relatively low. However, ongoing monitoring of water temperature, salinity, and chlorophyll levels will be implemented to detect early warning signs of harmful events. Climate variability and sea level rise present long-term uncertainties, but the use of adaptive management—through regular performance evaluations, reef elevation assessments, and substrate stability surveys—will enable course corrections as environmental conditions evolve.

Human-related risks include potential overharvest of oysters from restored reefs, which could affect sustainability. To address this, Levy County will coordinate with the Florida Department of Agriculture and Consumer Services (FDACS) and the Florida Fish and Wildlife Conservation Commission (FWC) to ensure all harvests comply with size limits and seasonal closures. The reef structures themselves will remain intact after harvest, supporting continued spat settlement and reef regeneration.

Workforce sustainability is another consideration. Recruiting and maintaining an adequate number of trained local workers will be vital to project success. Levy County plans to mitigate this risk through workforce partnerships with UF/IFAS, Florida Sea Grant, and the Cedar Key Oystermen's Association to train residents—including students, seasonal farmworkers, and veterans—in restoration techniques, reef construction, and adaptive management.

In summary, while CLEAR faces typical risks associated with coastal restoration, each has been

anticipated through best available science, proactive planning, and adaptive management. The project's integration of local labor, rigorous monitoring, and science-based permitting ensures that risks are minimized and the environmental, cultural, and economic benefits of restoration are sustained for decades.

Success Criteria and Monitoring

The CLEAR project will restore degraded oyster reef and estuarine habitats and reestablish sustainable populations of Eastern oysters (*Crassostrea virginica*) across Levy County's coastal waters. Success will be measured through biological, physical, and socioeconomic performance metrics that align with the RESTORE Council's standardized indicators for habitat restoration and community resilience.

Ecological Success Criteria

Quantitative success criteria will include measurable gains in reef area, oyster population density, and biodiversity. These criteria will be benchmarked against pre-restoration conditions and monitored annually for at least five years following construction. Specific ecological indicators include:

- Acres of oyster reef restored (HR006) – Target: 25–35 acres of restored habitat at Corrigan's Reef and adjacent coastal areas.
- Increases in oyster population density (SP001) – Target: ≥ 200 oysters/m² within three years post-restoration.
- Oyster size-frequency distribution – Target: Stable, sustainable age-class structure indicating self-recruitment potential.
- Water quality improvement – Target: $\geq 15\%$ increase in water clarity (Secchi depth) and measurable reductions in nitrogen and suspended solids.
- Habitat complexity and biodiversity – Target: Increased abundance of finfish, blue crab, and shrimp within and adjacent to restored areas.
- Environmental data such as temperature, salinity, dissolved oxygen, and chlorophyll-a concentration will be collected to contextualize biological outcomes and track environmental drivers influencing reef performance. Quantitative metrics will follow regionally standardized frameworks such as those established by Baggett et al. (2015) for oyster reef restoration.

Socioeconomic Success Criteria

Because this project integrates habitat restoration with workforce and economic development, success will also be evaluated using economic and community-based metrics:

Jobs created or supported – Target: 50–75 Levy County residents trained and employed in reef construction, monitoring, and aquaculture expansion.

Economic output – Target: \$10 million in project-related expenditures generating regional multiplier effects in coastal businesses and industries.

Tourism enhancement – Target: ≥ 10% increase in visitation and revenue for local ecotourism operators, charter captains, and seafood markets.

Workforce training outcomes – Target: 100% of trained workers receive certification or documented hours toward restoration or aquaculture credentials.

Monitoring and Adaptive Management Framework

Monitoring will occur through a tiered approach:

- Baseline Assessments – Conducted prior to construction to document pre-restoration conditions for comparison.
- Post-Construction Evaluations – Conducted at 6-month intervals during the first two years to evaluate initial reef establishment.
- Annual Long-Term Monitoring – Conducted years 3–5 to evaluate biological, physical, and economic performance and guide adaptive management.
- Community and Workforce Engagement Monitoring – Documenting employment metrics, volunteer participation, and stakeholder satisfaction through surveys and economic tracking.
- Ecological monitoring will be conducted by trained technicians from UF/IFAS Nature Coast Biological Station and Florida Sea Grant, in coordination with Levy County staff and local aquaculture professionals. Data will be reported annually through the Gulf RESTORE performance portal and used to refine restoration methods as necessary.

Adaptive Management and Data Sharing

Results will be compiled into annual progress reports and shared with the public via the Levy County website and community meetings. Findings will inform adjustments in substrate design, reef placement, or workforce allocation to maximize ecological and economic returns. The project will also contribute data to the Florida Oyster Integrated Monitoring Network and the NOAA Restoration Atlas, ensuring regional and Gulf-wide alignment

Project Milestones and Schedule

The total estimated time horizon of this project is 3 years. The expected start date is 2025, and the end date is 2028. The anticipated project milestones and schedule are shown in the chart below.

| MILESTONE | | | | | | |
|---|---|---|---|---|---|-------------------|
| | 1 | 2 | 3 | 4 | 5 | Deliverable (Y/N) |
| Procurement and Contractor Selection – Issue and award RFPs for reef construction, monitoring, and workforce training; procure materials and equipment for implementation. | | | | | | Y |

Gulf economy. By combining science-based restoration, workforce development, and heritage tourism, the project creates enduring environmental and economic benefits for Levy County and the Gulf Coast region.

Below are example milestones and budgeted amounts:

| MILESTONE | ESTIMATED TOTAL DOLLARS | ESTIMATED POT 3 ALLOCATION |
|---|-------------------------|----------------------------|
| Project Initiation and Planning – Project management establishment, coordination with partners and agencies, and initial design. | \$750,000 | \$750,000 |
| Permitting and Baseline Assessments – Completion of environmental permitting, data collection, and final design documentation. | \$1,000,000 | \$1,000,000 |
| Reef Construction and Deployment – Reef fabrication and installation of 25–35 acres of oyster habitat, employing local residents. | \$6,000,000 | \$6,000,000 |
| Workforce Training and Community Engagement – Local workforce hiring, training through UF/IFAS and Florida Sea Grant, and cultural heritage outreach. | \$1,000,000 | \$1,000,000 |
| Monitoring and Adaptive Management – Ecological and socioeconomic monitoring, adaptive management adjustments, and reporting. | \$1,250,000 | \$1,250,000 |
| Project Administration, Public Outreach, and Reporting – Fiscal management, compliance documentation, and annual/final reporting | \$578,960 | \$578,960 |
| Total Cost | \$10,578,960 | \$10,578,960 |

| COMMITTED FUNDING SOURCES | |
|--------------------------------|---------------------|
| Spill Impact Component | \$10,578,960 |
| Direct Component | \$0 |
| Other grants or co-funding | \$0 |
| Other County funds | \$0 |
| Total Committed Funding | \$10,578,960 |
| Budget Shortfall | \$0 |