

Project Narrative:

Oyster Restoration in Mississippi Sound

Project Title

Oyster Restoration in the Mississippi Sound and Surrounding Estuaries Using Innovative Techniques

Project Overview

This project aims to restore oyster populations in the Mississippi Sound and surrounding estuaries by utilizing both new, cutting-edge technology and proven reef restoration techniques. This project will employ a revolutionary new concept of oyster restoration by the deployment of oyster larvae, 6mm oyster seed via Agri drone, and ready to spawn 1.5" adult oysters. Over the length of this project, a three-step life cycle approach will be employed to increase oyster survivability and retention within the selected restoration sites. Water quality parameters and oyster disbursement rates will be monitored across the selected sites to measure the success of the project and to identify any necessary adaptations needed during the duration of the project. Step 1 of this project will produce and effectively distribute over 75 million ready-for-settlement oyster larvae in a new process that will help revolutionize how oyster restoration can be achieved. Step 2 will be the deployment of 15 million 6mm oyster seed by using cutting edge drone technology via Agri drone. Step 3 of this project will be the strategic deployment of 3 million 1.5" ready-to-spawn adult oysters. These deployment methods and the increase in oyster populations will complement the state's existing cultch efforts to create a sustainable oyster habitat which will foster the return of a thriving commercial oyster industry in the state of Mississippi. At the conclusion of this project, there will be a measurable enhancement of oyster populations within the selected sites as well as an increase in biodiversity and support to the local ecosystem.

Objectives

1. ****Restoration of Oyster Population****: Increase the oyster population in the Mississippi Sound to historical levels.
2. ****Habitat Enhancement****: Improve water quality and habitat complexity to support a diverse range of marine life.
3. ****Innovative Deployment****: Utilize modern technology such as Agri drones for efficient and effective oyster seed deployment.
4. ****Community Involvement****: Engage local communities and stakeholders in restoration efforts to foster stewardship and support for ongoing conservation.

Site Selection

- Identify suitable locations within the Mississippi Sound for oyster restoration, focusing on areas with optimal water quality, salinity, and existing substrate conditions.

- Conduct baseline assessments to ensure selected sites are conducive to oyster growth and survival.

Oyster Larvae Deployment

- Using an innovative approach to oyster restoration that can potentially revolutionize how oyster reefs are maintained and created in the future.

Agri drone Deployment of 6mm Oyster Seed

- Utilize an Agri drone to distribute 6mm oyster seed evenly across the prepared cultch beds.
- Program the Agri drone with precise GPS coordinates to ensure accurate and efficient seed dispersal.
- Monitor and adjust the deployment process as needed to maximize seed settlement and survival rates.

Hand Placement of 1.5" Adult Oysters

- Collect and transport by boat the sustainably grown 1.5" adult oysters from the nearby rearing site.
- Hand place adult oysters onto the selected sites to provide immediate ecological benefits and serve as an immediate source of larvae for future oyster generations.
- Ensure careful handling to minimize stress and mortality during the placement process.

Monitoring and Evaluation

- Conduct regular monitoring of the restoration sites to assess oyster survival, growth, and overall reef health.
- Use underwater surveys, drone imagery, and water quality testing to gather comprehensive data.
- Evaluate the success of the project based on oyster population metrics, biodiversity indices, and improvements in water quality.

Expected Outcomes

- ****Increased Oyster Population****: A measurable increase in oyster numbers within the restoration sites.
- ****Improved Water Quality****: Enhanced filtration and nutrient cycling, leading to cleaner and healthier waters.
- ****Biodiversity Enhancement****: Increased habitat complexity supporting a variety of marine species.
- ****Community Engagement****: Greater awareness and involvement of local communities in oyster conservation efforts.

This oyster restoration effort in the Mississippi Sound represents a critical step towards restoring a vital component of the Gulf Coast's ecosystem. By leveraging innovative technologies and involving local communities, this project aims to revive oyster

populations, enhance ecological resilience, and promote long-term sustainability in the Mississippi Sound.

Project Timeline

- **Phase 1: Planning and Site Selection** (Months 1-3)
 - Conduct site assessments and preparation of sites that are suitable for oyster deployment.
- **Phase 2: Deployment** (Months 4-36)
 - Execute the disperse of oyster larvae , Agri drone deployment of 6mm oyster seed, and hand placement of 1.5" adult oysters.
- **Phase 3: Monitoring and Maintenance** (Months 7-36)
 - Conduct regular monitoring and maintenance throughout the project duration to ensure effectiveness and success.

Budget for 3 years

- Construction oversight and deliverables management/ project and phase planning **: \$200,000
- Field staff operations/ oyster rearing and deployment **: \$375,000
- Equipment for oyster rearing and life cycle development **: \$300,000
- Agri drone technology and operations/ seed deployment **: \$110,500
- 93 million total oysters **: \$450,000
- Water quality monitoring, permitting, leasing, academic evaluation, data collection, and surveying **: \$110,000
- Community Engagement and Outreach **: \$15,000
- Total Budget **: \$1,560,500

Conclusion

The Oyster Restoration project in the Mississippi Sound combines innovative technology with proven methods to enhance oyster populations and improve the overall health of the marine ecosystem. Through the deployment oyster larvae, 6mm oyster seed via Agri drone, and hand placement of 1.5" adult oysters, this project aims to create sustainable oyster habitats that will provide long-term ecological and economic benefits to the region.



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On behalf of the University of Southern Mississippi- Thad Cochran Marine Aquaculture Center (TCMAC), we support Magnolia Key and the proposed project, "Oyster Restoration in Mississippi Sound and Surrounding Estuaries Using Innovative Techniques."

This project will support Mississippi's oyster restoration efforts. This project proposes to investigate a revolutionary concept of restoring oyster reefs and oyster populations in the Mississippi Sound by utilizing a cutting-edge technique of dispersal and deployment of hatchery produced larvae, seed, and adult oysters. The Mississippi shellfish population and the on-bottom industry can benefit from the successful conclusion of this project. We support this process, will participate as needed when appropriate, and we welcome this new technology development for the deployment and dispersal of larvae and oyster seed/ mature stocks.

We recommend fully funding this project and look forward to seeing and assisting in this advancement of merging aquaculture and fisheries to support the shellfish industry in the Gulf region.

Sincerely,

Megan Gima
Oyster Hatchery Manager
Thad Cochran Marine Aquaculture Center
University of Southern Mississippi