Texas General Land Office
Coastal Management Project – Cycle 26
Final Report

Construction and Enhancement of Artificial Reefs in the Northern Gulf of Mexico
Contract # 22-045-013-D110

This report was funded in part by a Texas Coastal Management Program grant approved by the Texas Land Commissioner, providing financial assistance under the Coastal Zone Management Act of 1972, as amended, awarded by the National Oceanic and Atmospheric Administration (NOAA), Office for Coastal Management, pursuant to NOAA Award No. NA21NOS4190136. The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA, the U.S. Department of Commerce, or any of their subagencies.

Submitted by:

Emma Clarkson, Ph.D.
Ecosystem Resources Program Director
Texas Parks and Wildlife Department
Artificial Reef Program
4200 Smith School Road
Austin, TX 78744-3291
Emma.Clarkson@tpwd.texas.gov

Table of Contents

Executive Summary

The Texas Artificial Reef Program (ARP) Coastal Management Plan (CMP) grant extended from October 1, 2021 through March 31, 2023. During this project period, a total of $407,145 was expended to fabricate and deploy 100 low-relief plates and 100 mid-relief pyramids in the nearshore Sabine region. Reef materials were deployed in July 2022 at the Sabine High Island 20 (HI-20) site. These structures provide nursery habitat for juvenile finfish and foraging habitat for their predators. Not only do these structures increase habitat and production of offshore fish communities, but they also create recreation and angling opportunities. The CMP grant was essential in facilitating this work and allowed the Texas ARP to direct its efforts to enhance nearshore marine habitats.

Background

The mission of the Texas Artificial Reef Program (ARP) is to enhance and preserve marine habitat in the Gulf of Mexico. The Texas ARP was created in 1990 after the Texas Artificial Reef Act of 1989 directed the Texas Parks and Wildlife Department (TPWD) to promote, develop, maintain, monitor, and enhance artificial reef potential in state and federal waters adjacent to Texas. The primary component of this legislation was focused on allowing the oil and gas industry to donate obsolete petroleum structures as artificial reefs within the "Rigs-to-Reefs" program in lieu of the standard salvage removal option required by federal law. Over the lifetime of oil platform operation, submerged platform legs (or "jackets") become encrusted with colonial organisms such as corals, sponges, and algae, which create structural habitat, serve as primary producers, and support a complex food web of fish and invertebrates. By creating the "Rigs-to-Reefs" program, the valuable habitat that forms over the lifetime of petroleum structure operation can be maintained within the marine environmental rather than removed.

However, the ARP extends beyond the Rigs-to-Reefs program, which typically occurs in federal waters. Some of the major successes of the program include habitat creation projects within state waters, including the "Nearshore" program and the "Ships-to-Reefs" program. The first highly successful artificial reef project occurred in the 1970's when 12 obsolete World War II Liberty Ships were sunk to create artificial reefs in nearshore Gulf waters. These sites have since been enhanced with additional materials, including recycled and fabricated concrete structures.

As oil and gas donations slow, the ARP has focused primarily on nearshore reefing opportunities, such as the ones conducted during this project. The ARP works with several partnership organizations, including the Friends of Sabine and the Friends of Rio Grande Valley, to source and deploy recycled and fabricated reefing structures at sites within state waters. These sites are typically shallow (< 80 feet) and can only use low- and mid-relief structures to avoid creating hazards to navigation. The use of smaller reef materials often results in the creation of nursery habitat for juvenile and young of the year species. The combination of all three reefing sub-programs (Nearshore, Ships-to-Reefs, and Rigs-to-Reefs) thus represents a wholistic, ecosystem

approach to habitat conservation that provides habitats for all life stages of marine fish and invertebrates. These habitats also enhance coastal recreation and serve as a destination for anglers and divers.

Since the development of the ARP, over 7,450 acres have been permitted across 93 reef sites for the creation of Artificial Reefs. This CMP project focused on enhancing habitat within the Sabine region, which lies in the northernmost Texas waters. The project site, High Island 20 (HI-20) is a 160-acre site located 8.3 nm from shore and was originally permitted in 2015. Since then, the site has received multiple material placements through coordinated efforts between the ARP and the Friends of Sabine group. Over the years, a combination of grants and donated funds and materials have been used to place over 250 concrete mid-relief pyramids, 100 low-relief reef plates, quarry blocks, bridge components, and 543 concrete culverts at the site. The addition of 100 pyramids and 100 plates from CMP Cycle 26 funding represents the final addition of material at this site, which is now considered completely filled and will be allowed to "rest". Over time, the ARP will monitor the site to determine if additional materials will be needed for long-term resilience.

Task 1 Summary: Soliciting Design and Construction Services

The Texas General Land Office (TGLO) and TPWD had a project kick-off meeting in September 2021. It was agreed that TPWD could use their existing blanket contract with Laredo Construction Inc. (Laredo) to complete the fabrication and deployment of the reefing materials, rather than conduct a separate bidding process for the project. The existing blanket contract had a scope of work that was consistent with the proposed project, and thus the work was eligible to be conducted under the existing contract. This expedited project timelines, as the state procurement bidding process can take one year or longer to complete. An amendment was signed with Laredo in March 2022, and the purchase was processed independently of all other work to ensure grant funds were used only for the deployment outlined in the Scope of Work.

The deployment of reefing materials was delayed due to a Special Award Condition (SAC) on the grant requiring a Section 7 consultation for the project before funds were released. The consultation was completed and the SAC was removed in April 2022. Because Laredo had to delay deployment due to the SAC, an additional amendment was signed with the vendor in 2021 to add the costs of re-mobilization, as well as the post-construction survey. The cost over-runs caused by the project delays were covered by matching TPWD-ARP funds.

Overall, the cost of construction, mobilization, deployment, and post-deployment survey amounted to $273,750. As the federal award was for $254,287, the remaining project costs, as well as the project management costs, were covered by the Texas ARP as matching funds.

Task 2 Summary. Construction and Deployment of Reef Materials

Materials were constructed in March 2022 and inspected by TPWD staff, who took photos and provided to the GLO per Task 3 requirements (Figures 1 and 2). A total of 100 low-relief plates and 100 mid-relief pyramids were deployed at the HI-20 Sabine site by Laredo on July 17, 2022. Plates were stacked to achieve higher vertical relief at a subset of the deployment locations; therefore, a total of 149 unique structures (some with two or three stacked plates) were placed within the HI-20 site. Appendix 1 includes the coordinates of each structure's deployed location, and a description of the materials (pyramids, single plates, double plates, or triple plates).

Figure 1. Mid-relief pyramids fabricated by Laredo in March 2022. Note the large opening that allows for escapement of marine life and prevents entanglement and entrapment. Also note the structurally complex surface, which allows encrusting organisms to recruit to the structures and maximize productivity.

Figure 2. Low-relief plates fabricated by Laredo in March 2022. Note how vertical relief and structural complexity is increased when they are stacked.

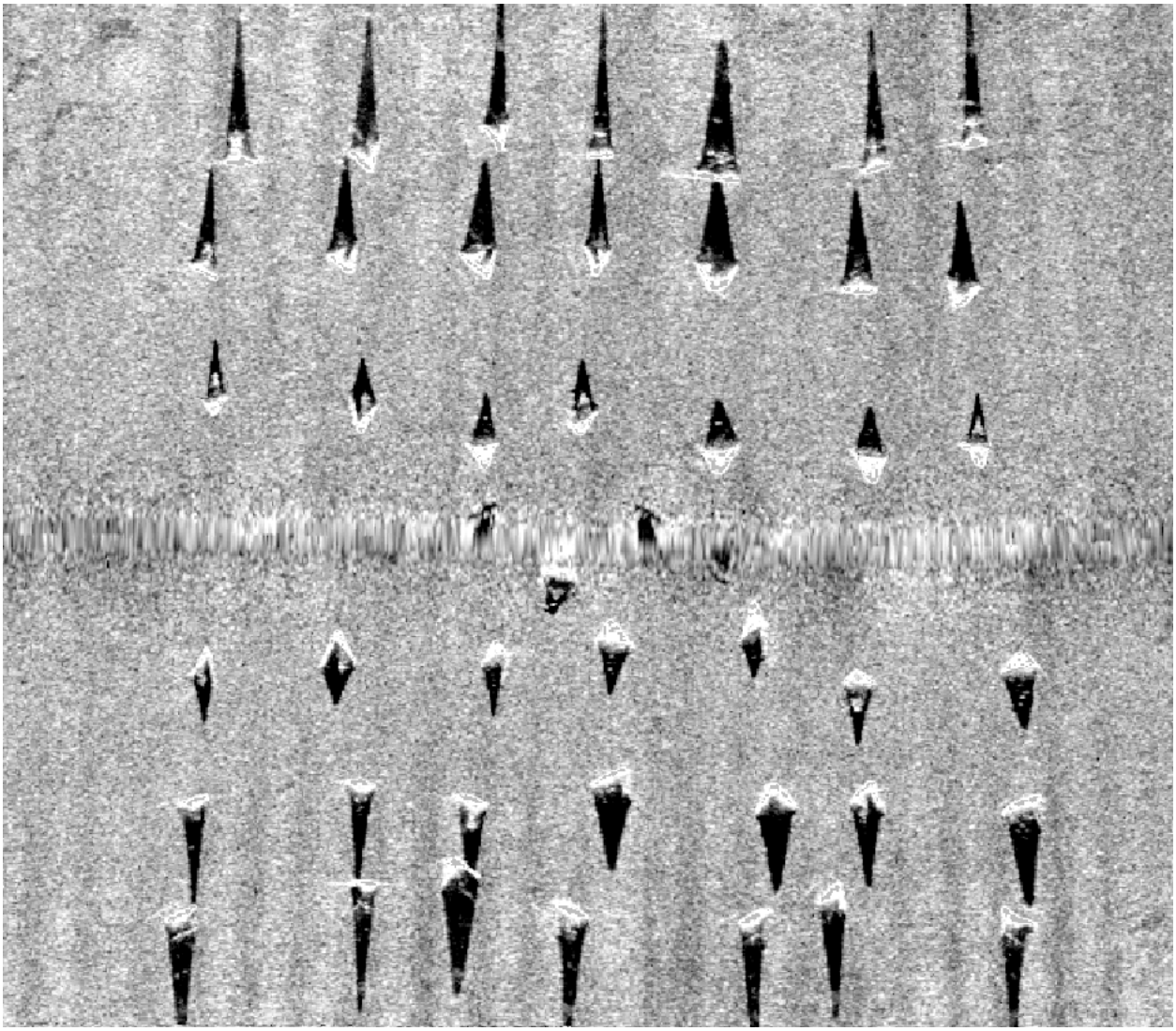

Figure 3. Sidescan sonar showing deployed pyramids within the HI-20 site.

Task 3. Project Monitoring and Reporting

Prior to the deployment of reef materials, a pre-construction sidescan sonar survey was conducted on January 6, 2022 to confirm the presence and location of other reefing materials within the Sabine HI-20 site. After the deployment of materials, a post-construction sidescan sonar was completed on July 25, 2022, and clearly identifies the deployed reef structures (Figure 4). The final survey report is provided in Appendix B. *

**Note – the survey company incorrectly misidentifies the structures as being all mid-relief pyramids in the report; 49 of the reef structures were comprised of single-, double-, or triple-stacked low-relief plates.*

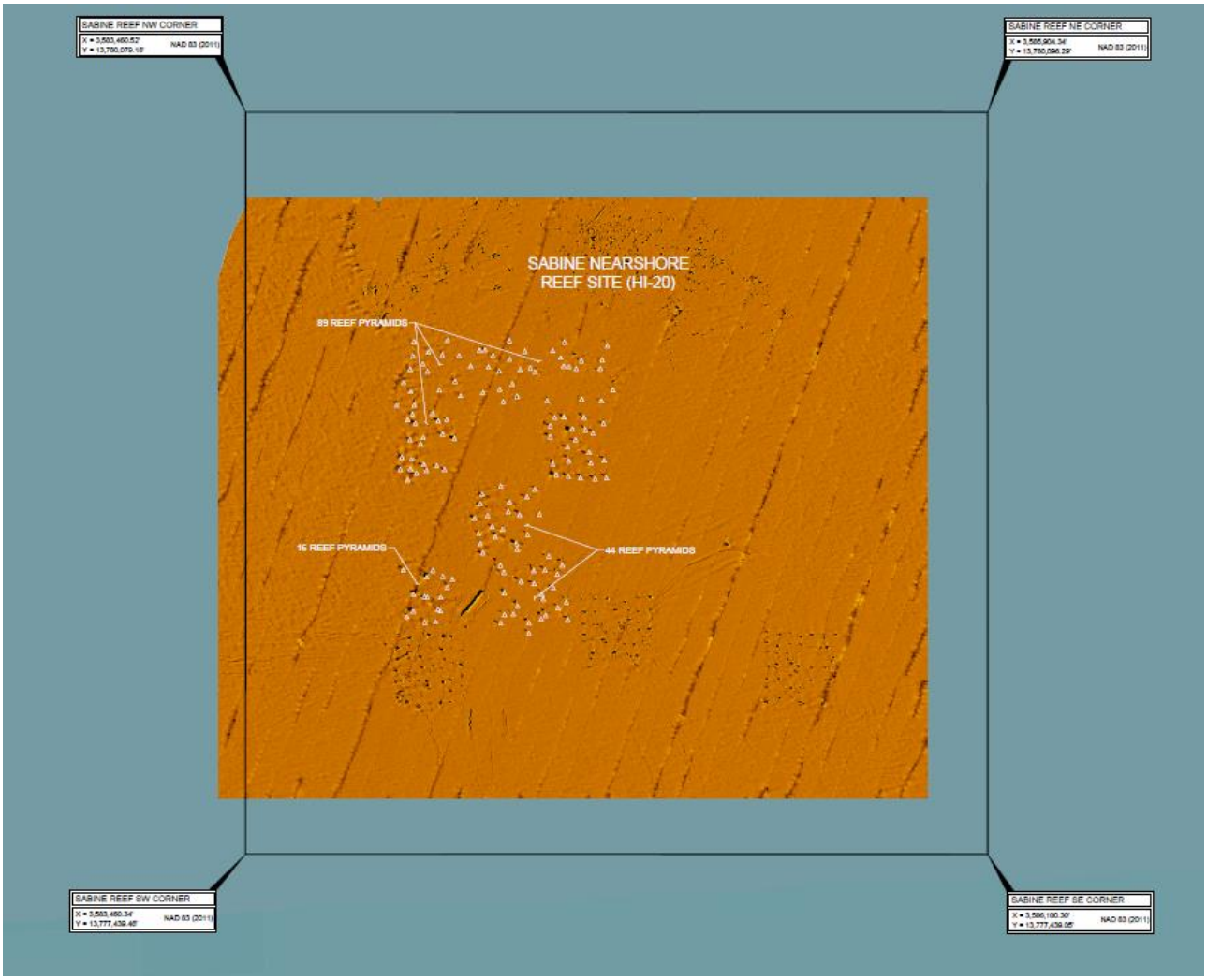

Figure 4. Sidescan sonar results showing 149 reef structures deployed at the HI-20 Sabine site.

The final deliverable of Task 3 includes posting photos information about the project with recognition of the CMP funding source on the TPWD ARP website. However, the ARP's website manager retired during this project, preventing our ability to update the website until further notice.

Instead, project details and photos were posted on the TPWD-Coastal Fisheries Facebook Page on 8/12/2022 (Figure 5).

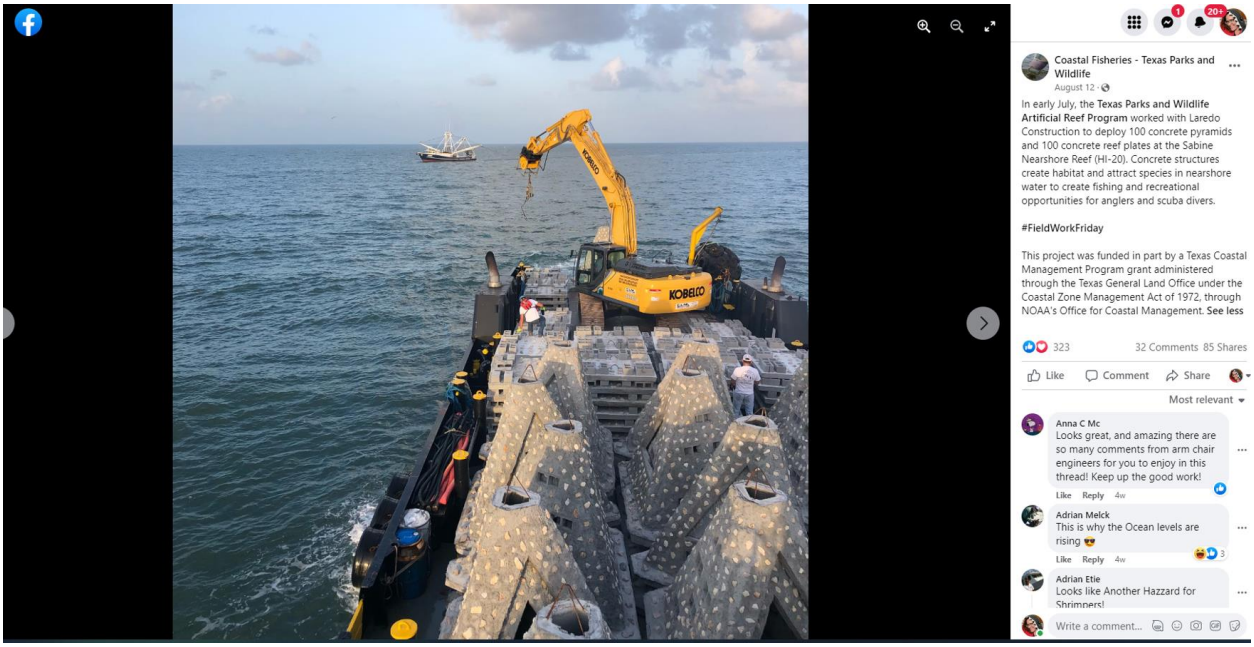

Figure 5. Screenshot of the TPWD – Coastal Fisheries Facebook post on August 12, 2022 highlighting the Sabine reefing project and crediting the CMP program.

Project Summary

A total of 100 low-relief plates and 100 mid-relief pyramids were placed at 149 locations throughout the Sabine HI-20 sites in July 2022 as a result of these CMP Cycle 26 funds. The placement of the materials was verified with a post-construction sidescan survey. As a result of this project, the HI-20 site is considered fully enhanced, and future projects will seek to establish a new reef site within the Sabine region. The TPWD ARP continues to be grateful for grant funding opportunities and our partner organizations, without which these habitat enhancement projects would not occur.