



## Offshore Projects

Alabama has five (5) permitted offshore reef zones measuring an approximate total of 1,030 square miles. Within these waters, the state and independent organizations have deployed numerous artificial reef structures over the course of the past sixty years. Further development of these sites using diversified reef materials will have a number of benefits, including building the connectivity between the five zones and establishing offshore habitat in the deeper waters near the outer limits of the reef zones, to provide a foundation for the long-term sustainability of the fish stock.

In order to meet the management goals of supporting the long-term sustainability of a diverse and abundant fish stock, it will be necessary that the offshore system be engineered using diversified reef materials. Specific offshore projects proposed in this plan are listed in (Figure 3.A), and include:

- Utilizing multi-beam side scan technology to characterize the seabed both inside and outside of Alabama's five Offshore General Permit Reef Zones. This technology will allow researchers to identify juvenile red snapper habitat, determine exactly which bottoms are best suited for habitat enhancement, and identify additional substrate formations that can be useful to the system.
- Deployment of low-relief habitat in twenty (20) acres of homogeneous sandy substrates for increased juvenile red snapper habitat. Multi-beam side scan technology will be utilized to identify suitable substrates within a safe distance from the nearest high-relief adult reef fish structures.
- Deployment of at least 100 exceptionally high-relief structures (+25' in height) to diversity reef habitats within the reef zones and meet fishery management goals and benchmarks for numerous fish species. These high relief structures are favored by amberjacks, gag grouper, red grouper, scamp, triggerfish and many other reef fish.
- Purchasing, preparing and deploying at least 3 large ships (+300' in length) for the development of dive sites available to SCUBA enthusiasts. This project could be accomplished through a partnership with the Alabama Reef and Restoration Foundation, Alabama Marine Resources Division, and others.
- Acquiring decommissioned gas rig jackets and platforms to be deployed in water depths ranging from 150' to 500'.

- Development of a Fish Attracting Device (FAD) program to increase catch rates of economically important pelagic fish – fish such as tuna, dolphinfish, wahoo, marlin and others. FADs will be deployed along gas rig reef sites and within waters ranging from 500’ to 3,000’ up to 100 nautical miles offshore.
- Deploy a total of six hundred (600) 6’ pyramids within the planned reef zones located six to nine nautical miles off the coast.
- Seek opportunities to revitalize the Alabama Marine Resource Division Reef-Ex program for the purpose of re-commissioning ex-military equipment for use as reef materials.
- Develop contract procedures with reef builders to prepare, transport, and deploy material such as barges, concrete well-heads, concrete culverts, decommissioned bridges, etc. which are donated to Alabama Marine Resource Division for use in reef construction.
- Development of a 5-year offshore monitoring program using SCUBA and Remotely Operated Vehicles (ROVs) to track the rate of ecological succession associated with newly constructed reef sites.
- Funding academic research to evaluate production rates associated with our newly created artificial reef sites over the course of 5 years.

Additional opportunities for future reef enhancement may exist in numerous offshore sites, such as the historic natural reef infrastructure found along the Relic Oyster Shell Ridge. This ridge is a series of ancient oyster reefs that proliferated approximately 10,000 years ago, before the last ice age, and which are believed to have deteriorated as a result of storm activity and natural degradation. The use of side-scan technology proposed in this budget will identify the locations of these ancient reefs, and allow the state to focus management efforts accordingly.

By diversifying the offshore reef zones in the manner proposed, this plan allows for the Alabama Marine Resource Division to more effectively monitor the state’s precious marine resources, while at the same time expanding the opportunities for multiple user groups to benefit from the investment – recreational fishermen, commercial fishermen, divers, the science community, the state and local municipalities. The combined impact of these user groups will have positive economic ripple effects for an untold number of supportive industries through increased tourism and commercial opportunities.

The total cost of the proposed offshore projects, including five years of scientific research and monitoring is approximately **\$12,483,500**.

### **Figures and Maps**

**Figure 3.A** Proposed Offshore Reef Zone projects, and total estimated cost for construction and material based on 2014 figures.

<b>Component of Offshore Project</b>	<b>Cost</b>
Multi-beam side scan inside Permitted Reef Zone (5 yr)	<b>\$450,000 (\$90,000/yr)</b>
Multi-beam side scan outside Permitted Reef Zone (5 yr)	<b>\$450,000 (\$90,000/yr)</b>
Enhancement of seabed with Juvenile red snapper habitat	<b>\$1,600,500</b>
Survey program on production of juvenile habitats (5 yr)	<b>\$375,000 (\$75,000/yr)</b>
Deployment of exceptionally high-relief structures	<b>\$1,500,000</b>
Estimated cost for converting 3 large ships into dive sites	<b>\$1,500,000 (\$500,000/ea)</b>
Acquiring decommissioned gas rig jackets and platforms	<b>\$32,500</b>
Development of FAD program for multiple stage use	<b>\$63,500</b>
Deployment of 600 pyramids within the planned six-nine nautical reef zone	<b>\$777,000</b>
Converting ex-military equipment into artificial reefs	<b>\$610,000</b>
Contracts for deployment of donated material	<b>\$1,000,000</b>
5 Year monitoring program using SCUBA and ROVs	<b>\$375,000 (\$75,000/yr)</b>
Academic research on Reef Productivity (5 yr)	<b>\$3,750,000 (\$750,000/yr)</b>
<b>Totals</b>	<b>\$12,483,500</b>

**Map 3.B.** Location of Offshore Reef Zones permitted by the United States Army Corps of Engineers.

