Osborne Reef Waste Tire Removal Project

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During the 1970s, between one and two million tires were put in the ocean off Broward County in an effort to create additional fish habitat. Over the years, many of the tires were mobilized by tropical storms and hurricanes, the movement of which caused damage to nearby existing coral reefs. The threat is serious, but the complexity and magnitude of the challenge of removing these tires has prevented any individual government agency from doing so.

The NOAA Marine Debris Program funded a reconnaissance project that was conducted in August 2006. The scope of work for this project included the development of a potential strategy for removing and properly disposing of the tires. It was decided that a pilot program was needed to test diver retrieval productivity, loading and transportation methods, and tire processing and disposal.

In 2007, a group of federal, state and county government agencies worked jointly to complete the pilot study with the objective of defining the technical and economic feasibility of coordinating agency capabilities to accomplish the objectives listed above. This joint-effort program involved Coastal America, US Navy, Army, Coast Guard, Florida Department of Environmental Protection (DEP), Broward County Environmental Protection and Growth Management Department, and Broward County Port Everglades Department.

Funding for the military mission, which included a multi-branch team of divers and an Army landing craft utility (LCU) ship was provided by the Department of Defense's Innovative Readiness Training Program. Permit fees, equipment and supplies, and tire processing services were funded by DEP out of 2007 abatement funds. Project management and dockage for the 2007 pilot were provided by Broward County.

The pilot project allowed productivity projections to be made for the remainder of the project. Monthly tire removal was estimated at 20,000 passenger tire equivalents (PTEs). At this rate, complete cleanup of the estimated 650,000 tires remaining would take more than the three years originally intended. After the pilot, it was decided that previously established priority areas needed to be redrawn to emphasize the importance of removing tires from the eastern edge of the affected middle reef (designated Priority Area 1). In order to remove the estimated 370,000 tires from Priority Area 1, an increase in military salvage resources, divers, and watercraft was needed during 120-day project periods in each of the three years beginning in 2009. Given these additional assets, Priority Area 1 was projected to be cleared in three years. Actual productivity was expected to increase in future years and the projections could be revised accordingly.

The extent of the funding required for full abatement was estimated to be about $3.4 million in state and county funds. The cost to abate the pile exceeded amounts in DEP's waste tire abatement contracts. Because of the need to save this resource, Governor Crist recommended, and the Florida Legislature passed a $2 million special appropriation in 2007 for DEP to complete its share of the project.

Using knowledge gained and lessons learned from the pilot project, the first full retrieval operation was successfully conducted in 2008. Divers worked 27 days with 16 dive days cancelled due to adverse weather conditions. An estimated 44,000 tires were removed over the

course of the operation by approximately 66 military personnel, including boat drivers and LCU crew. When conditions were ideal (i.e. calm seas, no equipment failures), the divers were able to recover approximately 2,500 tires during a single day. This was the maximum daily productivity that could be expected during the operation. The required time for the LCU to weigh anchors, return to Port Everglades, offload/reload trailers, and return to the dive site prohibited more than one load (two trailers) being recovered in any given day.

The second phase of the project began in July 2009. Divers worked an estimated 16 whole or partial days. An estimated 15,000 to 18,000 tires were removed over the course of the operation by approximately 50 military personnel, including boat drivers and LCU crew. Approximately 2,000 tires a day was the maximum productivity during this phase of the project. All subsequent removal activities were deferred due to foreign military missions.

The third phase of the project resumed in May 2015 with use of a commercial salvage dive company. In this phase, divers were focused on removing tires from Priority Area 1. Between May 2015 and February 2017, divers removed an estimated 95,000 tires.

The fourth phase of the project was spurred by a Florida Legislative initiative to utilize innovative technology. Through the efforts of the Department, two companies were put under contract to facilitate the project. One contractor was to utilize innovative technology while the second contractor would be diving using hands on methodology to retrieve tires. The innovative contractor and the dive contractor were to work together to increase productivity. The innovative contractor was not able to meet the terms of their contract to begin work. The dive contractor was able to retrieve approximately 350,000 tires between February 2017 and February 2023.

As the number of tires in Priority Area 1 has been greatly reduced, phase five was initiated to run in conjunction with phase four. The fifth phase of the project involves the removal and transplanting of coral colonies found on tires to increase the corals' chance for survival. When tires have been cleared of all viable coral colonies they are bundled and removed by the divers.

To date, an estimated 640,777 tires have been removed from the Osborne Reef. Divers are continuing to remove tires from the reef under DEP contract.

At the end of each mission, an after-action meeting with all partners has been held to identify any concerns and make recommendations to enhance productivity for the next phase of operations.