

[<=Back](#)



**Seawall Enhancement Features in Residential Canals  
Tampa Bay, Florida**



**Prepared for: Elizabeth Ordway Dunn Foundation  
U.S. Fish and Wildlife Service**

**Prepared by: Peter A. Clark, Executive Director  
Tampa BayWatch, Inc.**

[www.tampabaywatch.org](http://www.tampabaywatch.org)

**July 2000**

**1. Title of Project: SEAWALL ENHANCEMENT FEATURES IN  
RESIDENTIAL CANALS - TAMPA BAY, FLORIDA**

**Peter A. Clark, Executive Director  
Tampa BayWatch, Inc.**

8401 Ninth Street North, Suite 230B  
St. Petersburg, FL 33702

727-896-5320 , [www.tampabaywatch.org](http://www.tampabaywatch.org)

**2. Project Description:**

The Seawall Oyster Reef Program has been extremely active and successful over the last year. Due to the fact that residential finger canal construction has left extensive shoreline areas devoid of natural communities, the Seawall Oyster Reef Program has proved to be an important aspect in promoting oyster colonization in these canals. These canals are often too deep for mangrove or saltmarsh establishment and have unsuitable water quality for seagrass growth. By promoting oyster growth in these canals:

- the oyster communities provide diverse food sources or foraging areas for a variety of important species, such as redfish, snook, ibis, herons, crabs and shrimp,
- the oyster communities are able to naturally filter the water,
- the reefs help stabilize the sediments and lower erosion rates of shoreline areas,
- the surface areas and smaller interstitial areas are increased for other attaching organisms, like barnacles, sea squirts, and corals, thus improving productivity of the benthic area, and
- the constructed oyster communities provide recreational opportunities for the homeowners by improving fishing along the seawalls.

In the first year of the program, a total of 118 wooden tube reefs (sand fence), 76 wire reefs (chicken wire and rabbit wire tube reefs, and 13 bio-plastic (photodegradable seedling tubes) reefs were constructed, for a total of 207 oyster reef: reef construction for year one was completed by July 1999 and the reef units were allowed to collect oyster spat throughout the summer. By September, many of the reefs had been installed for one year and it was apparent that oysters were growing as expected on the snow fence and wire tube reef material; however, the tubular structures were biodegrading rapidly and, in some cases, collapsing to the bottom. Tampa BayWatch is strongly interested in providing biodegradable materials for oyster attachment, but additional time was necessary for the oysters to grow together and create their own oyster reef communities.



Students construct and install last year's snow fence type reefs.

While the snow fence material was ideal in terms of providing a broad surface area for oyster attachment and promoting a benign material safe for the marine environment, they biodegraded too rapidly. Tampa BayWatch staff began a international search for a similar type of material that would last longer in the Florida marine environment. Several other types of wood products were evaluated (pine, redwood, cedar) all of which appeared to have the same inherent

problem - dissolving too quickly. Alternative plastic slats are available in the snow fence material but are not biodegradable and are therefore contrary to our desire to provide a non-intrusive attachment site for oyster development. A recycled material that used a composite of waste plastic and wood chips was also explored, but was determined to be cost prohibitive as well as not fully biodegradable.

At this point, Tampa BayWatch discussed our program with a number of agencies to share our dilemma and seek other ideas and solutions. The US Fish and Wildlife Service has always been an active partner in our effort and local staff suggested looking into Reef Ball, Inc. for a smaller oyster reef unit. Reef Ball, Inc. is a commercial venture in Sarasota, FL that designs and constructs fiberglass frame molds to build concrete "reef balls" primarily for offshore coral reef communities. They do, however, have two smaller units, which were purchased through our program as a replacement for the snow fence type design that was used in 1999.

To date, Tampa BayWatch has purchased nine small "oyster reef ball" frames. The oyster balls are about 18" in diameter and 14" tall, weighing about 35 lbs. The two-piece frame is pinned together and also pinned to a bottom board. A round central bladder is inflated and a series of balls are placed between the bladder and the frame to create different sized holes. The frame is filled with marine friendly concrete (additives are added to the concrete to neutralize the pH, making it compatible to marine life) and allowed to dry for several days. A total of three larger "Lo Pro" reef ball frames were also purchased. The Lo Pro's are 24" in diameter and 18" tall and weigh in at 75 lbs. The Lo Pro reef balls are significantly bigger and more difficult to construct but provide a larger habitat unit when installed.

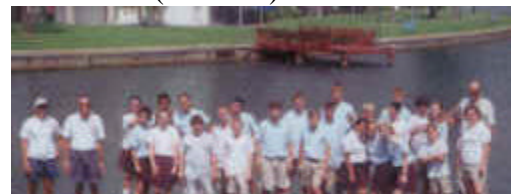
Finally, the Environmental Protection Commission of Hillsborough County artificial reef department also suggested exploring another style called "A-Jacks" units. These are concrete, six-pointed, interlocking units that look similar to a child's jacks (see photos attached). The A-Jacks are purchased already constructed and generally installed under docks - since they are less boater friendly than the reef ball units. The A-Jacks also provide a large exterior surface area that is different from the round, hollow reef ball units, allowing us to explore and compare oyster attachment rates and fishery utilization of the alternative oyster reef units.



The design change is the result of our professional and community-monitoring program that rapidly identified early biodegradation of the year one reefs and the need to explore a new approach. The oyster reef units that are being constructed for the year two effort provide a viable alternative program that can be implemented with school kids and community groups.

The purchase of 12 fiberglass frames allows Tampa BayWatch two sets of six frames that can be rotated among school programs, neighborhood groups or other groups, to construct reef units on-site.

During the second year of the program, a total of 250 additional reefs have been constructed and installed. A total of 44 Lo-Pro size reef balls, 192 oyster ball size, and 14 A-Jacks style reef units were constructed during the USFWS program period. Most of the new reefs (92 in all) were installed in front of individual homeowner seawalls in northeastern St. Petersburg. Admiral Farragut Academy also built and installed 19 seawall reefs in their boat basin located on Boca Ciega Bay in St. Petersburg. St. Raphael's Preparatory School constructed and installed an additional 31 seawall reefs in the Snell Island



area of St. Petersburg. An additional eight reefs were installed at the Snell Isle Marina by Tampa BayWatch staff.

Tampa BayWatch completed a project in the spring of 2000 with the Neighborhoods Against Stormwater Pollution in the Westshore area of Tampa. The neighborhood group received a small grant from the Southwest Florida Water Management District to conduct community education on stormwater and install seawall reefs in their canals. The residents asked Tampa BayWatch for assistance to fulfill their contractual obligations. Tampa BayWatch acquired the necessary permits from the Tampa Port



Molds used to construct the 100 reef units for installation in the Westshore area of Tampa.

Authority and Environmental Protection Commission of Hillsborough County to install 200 units over the next five years. A total of 100 seawall oyster reefs were constructed and installed this spring. The remaining 100 permitted reefs will be placed in the Westshore area next fall.

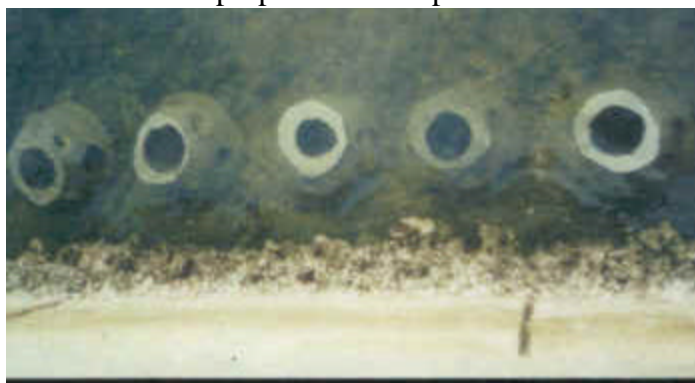
This brings the two-year program total to 457 seawall reefs. Our initial program goal to construct and install 500 reefs within the first three-year time frame is on schedule to be completed. These constructed oyster reefs have been placed throughout the bay, either behind residential homes, local boat ramps (along the seawall), marinas, or behind public school property.

Generally, sets of three to five reef units are placed in front of the seawalls at a number of locations. Greater numbers of oyster reef units have been placed at public parks and schools due to the larger length of the available seawall. Lo Pro and A-Jacks reef units are most often placed under docks because of their larger size. Community events with youth groups, fishing organizations, homeowners' associations and others are organized to help construct the reef balls and install the oyster reef units at local public parks or other waterfront neighborhoods.

Tampa BayWatch also monitors and evaluates the effort regularly to establish a successful program. The numbers of homeowners involved in the program and community volunteers participating in the construction and installation of the tubes have been documented. The quantities of oysters colonizing on the newly placed oyster reef units have been tabulated to evaluate proper shoreline placement and best construction material. Homeowners are asked to regularly check their reefs for signs of growth and record the information, as well.

Several schools and youth programs have participated in the program over the last year with several more events planned with kids in 1999-2000. As of the spring of 2000, the following community groups have requested to participate in the seawall oyster reef program with Tampa BayWatch:

- Countryside High School
- Shorecrest Preparatory School
- Seminole High School
- Bayou Grande Boy Scout Troup
- Pinellas Marine Institute
- Westshore Homeowners Association



Newly placed oyster reef balls at the toe of a residential seawall.

Depending upon recent media, Tampa BayWatch also has an ongoing database of residential homeowners interested in receiving the free seawall oyster reefs. Our current database contains 42 interested homeowners who we are addressing on a continuing priority basis. Some of the land-locked schools can help construct the seawall reef units for area homeowners and it's a matter of time to construct the units and find the right homeowners for proper placement.

### **3. Project Completion Date: June 15, 2000**

**4. Budget:** The Elizabeth Ordway Dunn Foundation -- \$25,000 USFWS (Fish Habitat Restoration funds) --\$10,000 Private landowners -- approx. \$5,000 in-kind services Pinellas County Schools -- approx. \$5,000 in-kind services

### **5. Habitat and Fish/Wildlife Benefits:**

More than 44% of the shoreline vegetation, mangroves and salt marshes, the bay's primary nurseries, have been destroyed to build waterfront homes and seawalls. In the city of St. Petersburg alone, there are 288 linear miles of seawalled shoreline, primarily in residential single-family homes on "finger fill" type construction. Destruction of mangrove and marsh habitat has impacted colonial shore and wading birds dependent on mangrove forests, marsh, and sandy beaches for nesting sites. Additionally, years of poor water quality have impacted the bay's scallop and oyster fisheries and there are currently very few locations in Tampa Bay where oyster harvesting is permitted due to poor or degraded water quality conditions.

Residential finger fill construction has left extensive shoreline areas devoid of natural communities. Canals are often too deep for mangrove or saltmarsh establishment and have unsuitable water quality for seagrass growth. Providing oyster and other benthic (bottomdwelling) organisms colonization opportunities in front of seawalls greatly improves these man-made canals by providing the following community benefits:

- The oyster reef communities provide diverse food sources or foraging areas for a variety of important fish species (redfish, snook, sheepshead), birds (American oystercatcher, ibis, herons), and other wildlife species (blue and stone crabs, and shrimp).
  - Oysters are filter feeders capable of surviving in a variety of water quality conditions and are found throughout the estuarine portion of the Tampa Bay ecosystem. Oysters can potentially filter 37 liters (9.8 gallons) of seawater every hour providing a natural cleansing system for the bay.
  - The hard bottom communities formed by oysters help stabilize bottom sediments, resulting in reduced turbidity levels, and lowered shoreline erosion rates, thereby protecting adjacent property owners during storm events.
- Oyster reefs greatly increase surface area and interstitial area for other attaching organisms (such as barnacles, sea squirts, anemones, sponges, corals and algae), immensely increasing the productivity of the benthic area.

**a. Amount of Habitat Improved** -- Assuming that an average of three units are placed at each residential home (about 100' shoreline) the program is expected to enhance approximately 1.25 miles of seawalled canals on a yearly basis.

**b. Species of Management Concern Benefitted:**

**i. oyster communities:** oyster, stone crab, blue crab, starfish, shrimp, sea fans, attached algae, sponges, octopus, etc.

**ii. fishes:** common snook, redfish, spotted sea trout, sheepshead, pinfish, juvenile fisheries and others.

Tampa BayWatch's Seawall Oyster Reef Program is designed to promote the growth of oysters along residential canals of Tampa Bay. Once established, the oyster communities will promote water quality benefits through filtering the water, provide habitat for small organisms, promote storm protection, and create foraging and sanctuary for many species of fish and wildlife.

[<=Back](#)