

2013 **SHALLOW WATER** ISSUE

FLORIDA SPORT FISHING

JOURNAL FOR THE **WATER**

CROAKER
SAVE
THE DAY

SARASOTA
SPRING
SLAM

FISHING
DOCK
LIGHTS

HIDDEN
COAST
SECRETS

GULF
COAST
COBIA
KILLER
p.24

SEEING TRIPLE

LOW
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RESULTS

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DISPLAY UNTIL MAY 1, 2013

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TROLLING LURES • REELS • FIGHTING BELTS • SWIMMING PLUGS • MOORING LINES • SWIVELS
ALUMINUM TOWERS • GAFFS • CHUM • **MODERN MARINA** • ENCLOSURES • BRAIDED FISHING LINE...

MADE IN
FLORIDA
SERIES



MISSION OBJECTIVE: INVESTIGATE & REVEAL

TARGET ACQUISITION

Modern Marina

Anglers and boaters rarely consider the tremendous effort required to design and manufacture the countless components and accessories that enhance our on-the-water experiences. Skilled craftsmen design and assemble many of these essentials right here in Florida. We wanted to learn more about these companies and we are confident that you, too, will be fascinated with what we uncover.

[STAFF REPORT]



➔ It is no secret that Florida is a boater's paradise that attracts visitors from all over the world. With thousands of miles of navigable inshore waters leading to expansive open oceans, Florida really is the best place to enjoy the outdoors. While the natural surroundings are impressive, they aren't invincible and are susceptible to habitat degradation and pollution from numerous sources. Thankfully, many enjoy the water with an underlying goal of helping promote the conservation and stewardship of critical inshore habitats.

Nestled along one of Florida's most biologically diverse estuarine systems, the Sunrise City is home to the world famous Indian River Lagoon. Spanning approximately 156 miles from Ponce Inlet to Jupiter Inlet, the IRL system is a shallow body of water that provides ideal habitat for a variety of highly desirable species that drive critical tourism dollars to the state. While offshore waters provide exciting opportunities with sailfish, dolphin, grouper and more, the inshore waters are heralded as some of the best for encountering jumbo seatrout. In fact, the state record seatrout—17 lb. 7 oz.—was pulled from the fertile shallows of the Indian River.

Only a short distance from the Inlet State Park, Fort Pierce City Marina provides a quiet, safe and friendly atmosphere with ample amenities for both transient and resident boaters. Owned by the City of Fort Pierce and established in 1938, this deep-rooted marina sits along the historic downtown riverfront and is an important symbol for the city, and for the state.

Unfortunately, the marina sustained serious damage during the 2004 tropi-

cal storm season when Hurricanes Frances and Jeanne destroyed 140 slips at the marina. Restoring the iconic facility and estimated \$15 million in damage wasn't going to be as easy as simply driving new



◀ After years of planning, construction crews could finally get to work.

pilings, nor was that the plan. The goal of the newly designed Marina was to build a safe harborage that

provides adequate protection from future storms, while simultaneously promoting the well being of the fragile surrounding ecosystem. The renovation would serve as a pilot project for the State of Florida, with two years of monitoring required after completion to deem the project a success.

After the storms passed, damaged boats and docks were removed while plans for construction of a new marina were already in the works. However, it wasn't until 2005



Because of the significance of the surrounding shallow water habitat, the entire construction project would have to follow stringent regulations.

when plans were developed to create a series of man-made islands in front of the marina to provide much needed protection from future storms. In addition, the new marina would feature two dock complexes. Once complete, the southern dock will contain 98 slips while the northern dock will contain 39 slips. The

▼ Slowly but surely, the islands began to take shape.



“ To further protect the frail ecosystem, all construction would be executed from shallow-draft barges that provide ample clearance from the bottom...

outer harbor entrance will also be moved from the south to the northern portion of the harbor to improve public access and navigation. Because of the significance of the surrounding shallow water habitat, the entire construction project would have to follow stringent regulations.

Before a single stone could be moved, city officials had to go through a lengthy permit process from the EPA, Marine Corps of Engineers, NMFS and U.S. Fish & Wildlife. Construction crews also needed Clean Water Act permits for the project, which require crews to utilize techniques that

minimize sediment turbidity in an effort to limit adverse impacts on the area's water quality. To further protect the frail ecosystem, all construction would be executed from shallow-draft barges that provide ample clearance from the bottom without damaging the local substrate.

▲ Marine construction crews meticulously placed each bucket of sediment.



It wasn't until 2009 when the design of a breakwater featuring 12 man-made islands and one peninsular structure was approved by the Department of Environmental Protection, but city officials still needed approval from the Army Corps of Engineers. One of the major setbacks was making sure the area's essential seagrass beds weren't disrupted. Almost 7 years from the storm's damage to the area, the Army Corps of Engineers finally announced approval and since, construction crews have been working full time. While a tremendous amount of progress has been made, this isn't

◀ Near completion, the breakwaters will also provide essential habitat.

like any other marina project in the country. Expert contractors needed to incorporate



numerous eco-friendly measures to further protect the threatened and endangered species that call the Indian River home.

The finalized plans called for a 10.51-acre island, surrounded by 12 freeform breakwater islands. Constructed with sand filled Geotubes, the largest island is also anchored by T-groins and rock-filled marine mattress units. Furthermore, native vegetation was added to increase habitat diversity. While the main island features sand filled Geotubes, the smaller islands were covered with natural limestone to provide even greater storm protection. It's also important to note that construction crews utilized natural sediment with the same characteristics of the local sediment in an effort to promote growth and limit future erosion.

Hoping to enhance seagrass communities, bird stakes were added to the area to encourage roosting of wading birds and waterfowl, which add natural fertilizer for growing grass beds. Seagrass is one of the most important factors among inshore communities and the new islands will provide an estimated 8.12 acres of new seagrass recruitment areas. Additionally, The City of Fort Pierce deeded 26 acres of submerged land to the State. This 26-acre parcel is adjacent to the Inlet State Park

▲ A major change to the area's seascape is clearly in the works.

and contains pristine seagrass beds, tidal flats, and submerged mangrove habitat. An additional 30 acres were given to the State as proprietary public interest.

As of press date the revitalization project is nearing its final stages, with completion of the islands expected in May 2013. While protecting vessels in the marina is a priority, the environmentally friendly project will

result in 1.28 acres of new oyster habitat, 6.26 acres of artificial reef habitat, 2.22 acres of coastal dune habitat, 2.33 acres of shorebird habitat, 8.12 acres of seagrass beds and 1.54 acres of mangroves.

Home to numerous tournaments and within walking distance to the library, museum, shops, parks, art galleries and restaurants, The Fort Pierce City Marina will soon shine again. **131**

▼ Once complete, the Fort Pierce City Marina will be better than ever!



Storm Protection Islands for Fort Pierce Marina Nearly Completed

by Anna Townshend



In December 2012, the contractor continues building the man-made storm protection islands for the city marina in Fort Pierce, Fla. (Photos by Steve Irwin of Island Marine Electronics)

In 2004, Hurricane Frances made a slow approach as a Category 2 storm, lasting approximately 34 hours. It did catastrophic damage to the city marina in Fort Pierce, Fla. It destroyed many docks with boats still moored on them, totaling \$28 million damage to the marina alone.

Rather than rebuilding in-kind, the reconstruction plan included 13 man-made islands, which would protect the marina. Construction began in February 2012 and will be completed in May of this year.

Maccaferri Inc. provided the materials to form the islands. At the end of March, Jenna Phillips, technical manager and coastal engineer for Maccaferri's Coastal Protection & Dewatering Business Unit, conducted a webinar to outline the development and construction of the islands, using Maccaferri's GeoTubes, large geotextile tubes, and marine mattresses, compartmental structures, composed of a high density, flexible, UV-stabilized, polypropylene grid.

Fort Pierce Marina is located on the western shore of the Indian River Lagoon, just south of the Fort Pierce

Inlet. The islands are built to protect the marina from large open water areas within the lagoon to the south and southeast. The maximum fetch length within the lagoon was about 13.7 miles (22 km) with fairly shallow water depths. The marina is also located within the flood tidal delta, so strong tidal currents

flow in the area upwards of two meters per second.

The City of Fort Pierce applied to Federal Emergency Management Agency (FEMA) for assistance, which it got, on the basis that the project would provide a more robust storm protection system. The overall goals of the project included protection from a 100-year storm, along with positive environmental impacts and aesthetically pleasing structures.

A hydrodynamic study analyzed a total of 17 island configurations before making a physical model of the final version, including 12 islands and one peninsula structure. In addition to storm protection, the islands would provide areas for oyster recruitment and mangrove habitat.

The main 10.5-acre island, called Tern Island, is approximately 1,500 feet long and 300 feet wide. It consists of seven groin structures for stability and sand fill in the interior portion. The interior island crest will have a coastal sand dune and living shoreline. A 15-foot wide bench at the waterline was built to enhance oyster recruitment and mangrove habitat. Oyster bags and planted mangroves were placed along the seven groin structures. The island crest will be planted with native vegetation for long-term stability and habitat for birds.

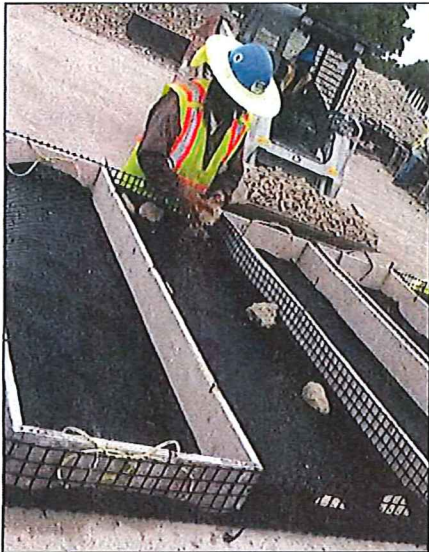
To construct the island and peninsula,



This shows the islands construction progress on March 15. The marina project will soon go out to bid, expecting to begin construction in July. (Photos by Steve Irwin of Island Marine Electronics)



The mattresses used were two different thicknesses, 12-inch and five-inch, and were five feet and six-and-a-half feet wide. The stone fill ranged in diameter from five to 20 inches.



The marine mattresses were filled on-site. The smaller ones were placed on a flat surface and filled by hand to reduce the void space.



PVC stakes were used as guides for the mattress placement. A crane roughly placed the mattresses, and divers made the final adjustments.

Maccaferri provided 10,700 feet of geotextile tubes as a perimeter dike for the island creation, the structural core of the groins, and the beach for the living shoreline. The 250,000 square feet of marine mattresses were used in three ways: as a foundation for the islands to prevent settlement and scouring; a cushion layer and protective barrier between the tubes and the armor stones; and a platform for oysters and mangrove planting.

The sand material to fill the tubes came from an upland source. It was brought to the project site by barge and loaded to a hopper. About 250,000 cubic yards of sand were used to fill the tubes. Material to backfill the island, once the perimeter was established, was dredged from the marina basin.

Contractors prepared the marine mattresses on-site. They were placed in water depths from three to 18 feet. While depths didn't play a significant role in the speed and accuracy of the placement, water quality and current velocity did. Clarity was good at the beginning of the project. However, Hurricane Sandy resulted in about a month and a half of poor visibility. This of course affected the speed and accuracy, and did require some reinstallation. By January, water conditions had improved.

The strong current velocities also played a role in installation. The dredging contractor could pump around 450 cubic yards in approximately four hours, and divers in the water, who ensured the accuracy of the final placement, had to wear 40-pound

weights to combat the current.

For installation of the tubes, the scour protection went first, then the tubes were deployed, rolled out and stacked into place. Using a hopper dredge and submersible pump, contractors filled the tubes from both ends to anchor them during the tidal change. To prevent the tubes from acting like a sail, they had to be deployed during slack tide, so contractors had a short window in order to get them in place and staked down every 10 feet on center. The tubes also had seat belt-like straps sewn in to the side seams of the tubes. Originally, the belts were placed every 25 feet and eventually put every 10 feet on center for more control.

For the mattress installation, PVC stakes guided the placement, and a crane and lifting bar did a rough placement on the mattress. Divers made the final adjustments.

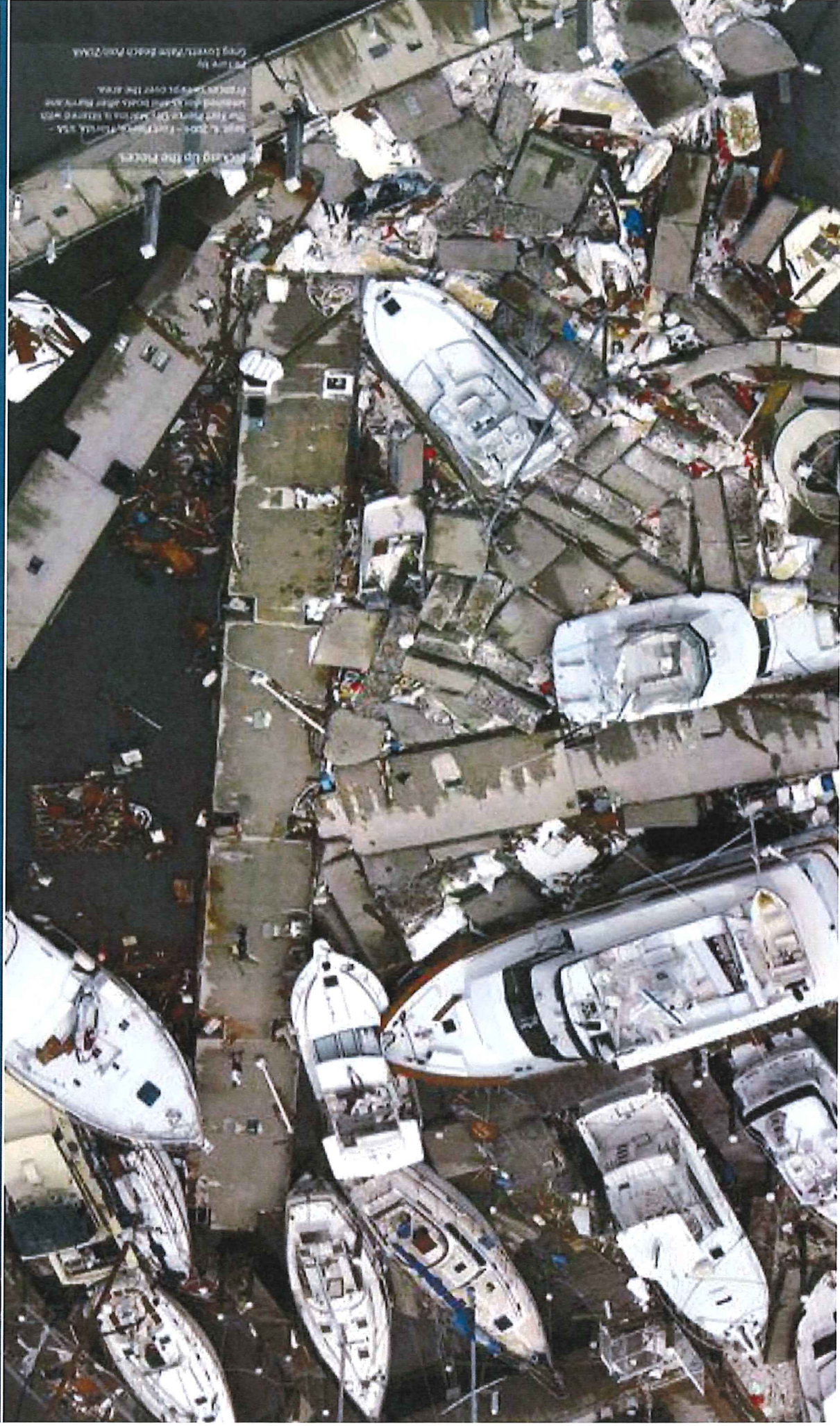
The mean tide range for this area was about 1.5 feet, with the highest tides occurring in the fall and the lowest lows in the spring. The water level elevations had the greatest effect on the armor stone installation. Contractors had to transport the barge half full and wait for high tide to begin installation. For the construction of the shallow groins, which happened during fall at the high water levels, contractors were able to mostly transport full barge loads.

Upon final completion in May, the island structures should allow the marina to increase capacity, as well as provide additional space for eco-tourism and recreation in the area. ⚓



The 12-inch mats required a filling frame, fabricated by the contractor. The panels came pre-assembled with the exception on the side panel, through which a front-end loader placed the stone fill. Then, the side panel was attached and loaded into the stockpile.

2004 Hurricane Season



Stacking Up the Pieces
By
Greg Lovett/Palm Beach Post/DMAA
The Fort Pierce, Fla., marina is strewn with
debris from boats, after Hurricane
Frances swept over the area.

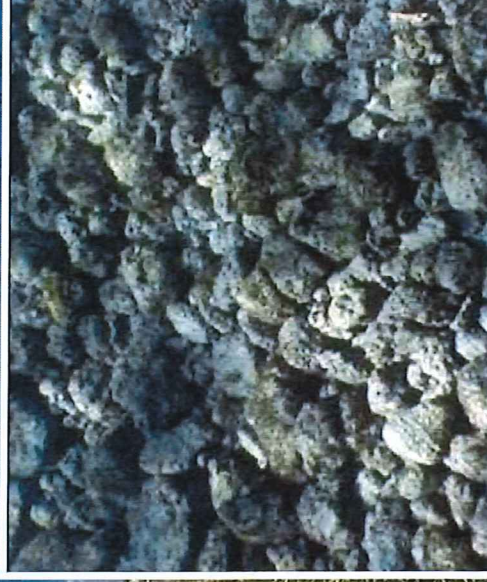
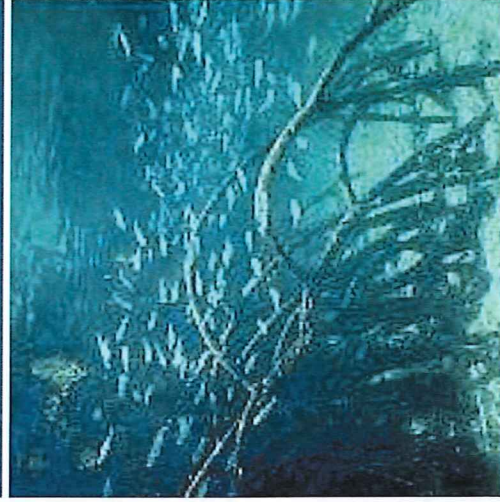


Mosaic Habitat Creation

Total Island Project = 14.66 acres of fill

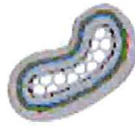
Total Habitat Creation = 21.75 acres

- Oyster Habitat Created = 1.26 acres
- Artificial Reef Created = 6.27 acres
- Mangrove Communities Created = 1.55 acres
- Coastal Dune Habitat Created = 4.55 acres
- Seagrass Recruitment = 8.12 acres

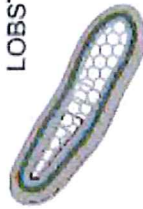




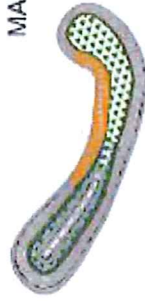
Habitat Islands



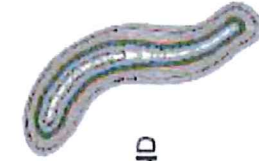
SHELL ISLAND



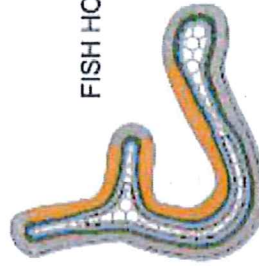
LOBSTER ISLAND



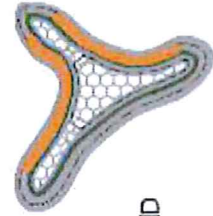
MANGROVE ISLAND



EEL ISLAND



FISH HOOK ISLAND



STARFISH ISLAND



SNOOK ISLAND



MANATEE ISLAND

