

Florida Gulf of Mexico Restoration
Project Submittal Form

Project Name: Creation of hard bottom ledge habitat to support recreational/commercial juvenile fisheries recovery in Tampa Bay.

Contact Information

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Project Location (include map, if possible, and the city, county, long/lat, and watershed)
In the counties of Manatee, Hillsborough, and Pinellas, Florida. Tampa Bay Watershed. The project is roughly linear, from N27d 35' W82d 37' to N27d 39' W82d 40' along the course of the Sunshine Skyway Bridge across the mouth of Tampa Bay. See map at end of document.

Project Description (describe all aspects of the project)

This project directly addressed Florida priority #5. Fish and Wildlife Habitat and Management.

The project is to create hard bottom ledge habitat to support juvenile fish production by placing artificial hard structural habitat in a discontinuous formation which runs roughly parallel to and adjacent to the footers of the Sunshine Skyway Bridge. The habitat has been designed in a manner which will attract and support members of the grouper-snapper-grunt complex but more specifically, the design will select for those fishes which range in size from juvenile to sub adult. Members of this complex of fish are most commonly gamefish and predatory and have long been sought as a recreational and commercial food source. Members of the complex are also prone to occupying mangrove and seagrass beds in their post larval and early juvenile stages. Adults typically occupy reef or structure with moderate to considerable vertical relief, where they are often heavily fished.

In Tampa Bay, the common practice of filling in coastal and nearshore areas to create land for development had the unintended consequence of burying the intermediate habitat between the vegetated shallows and the nearshore reefs in the Gulf. The intermediate habitat is made up of old shoreline and is often a ledge no more than 6 inches in height. The upper platform, located between the ledge and the shore is hard and populated with sponge and attached algal growth. Approaching the shore, where sands accumulate, can be found sandy bottoms or seagrasses when light conditions are right. Deeper areas are often characterized by a veneer of sand over hard substrate through which occasional hard formation, isolated corals (Scleractinia, and Alcyonaria)

can be found. The ontogenetic pathway for the managed species typically would run from vegetated shallows, to low relief ledges, and then across the deeper areas to higher relief formations.

In the Tampa Bay area, seagrasses and mangroves have rebounded well as a result of positive management efforts. Offshore (nearshore) ledges have been augmented with high relief artificial reefs in the form of hard debris and wrecks. This project will supply the intermediate habitat and is expected to increase the survival of juvenile and sub adult members of the complex, thereby providing for greater recruitment of adults (fishable) to the reefs. Even with the fishing pressure, proper management is expected to result in more members in the breeding population and greater reproductive success. Eventually, a new equilibrium will be reached and it is expected that the result will be a greater population of grouper, snapper, and grunt throughout the region.

The intermediate habitat to be supplied has been tested successfully in an installation at the Egmont Key artificial reef site, previously managed by Hillsborough County (2008 Gulf of Mexico Foundation funded project). Based on the research of Hixon and Beets (1993, Ecological Monographs, 63: 77 - 101 and subsequent papers) the design offers cavity sizes specific to inhabitants in the desired size class, and prohibitive to larger fish. Final designs and distribution of the installations would need to be concluded. Installations are expected to be shallow, as occurs in nature, from 6 to 15 feet (bottom) and less than 2 feet in vertical relief.

Estimated Project Costs (describe the estimated costs of the project, including any assumptions for contingency and ongoing operations/maintenance. Identify other secured funding sources such as matching funds, in-kind contributions or state/federal dollars. In addition, if possible, complete and submit the Cost Appendix Sheet associated with this form):

Overall project costs are anticipated to be \$3,793,950 but are flexible. The estimate is expected to provide habitat throughout the entire span of the available space, a distance of approximately 4,900 linear meters and averaging 5 meters wide. Partial funding would provide proportionally less, but equally valuable improvements.

Conceptual plans include 4700 major reef units and 105,750 minor units placed proportionally on the north and south portions of the bridge. By category, the breakdown is:

Final design and permitting: \$237,500.

Materials and installation: \$3,306,450.

Monitoring: \$250,000.

Other funding (indicate if the project is submitted for any potential funding or if it may be used to leverage additional funding, if so please describe the funding source (e.g. State/Federal Grants):

None at this time.

Technical feasibility (describe the technologies involved and any relevant past experience or proven success with similar projects):

Conceptually, the project is technically sound. Factors with less than absolute certainty include water depth at proposed installation points, full spectrum current profiles, and existing structure or debris in the proposed locations. Depths are generally known, but a survey is needed.

Environmental Benefits (Describe the nature, magnitude, and timing of any environmental benefits attributable to the project. If possible, describe potential environmental performance measures [e.g. pollutant reduction]. Please address any potential environmental impacts associated with implementing or maintaining the project [e.g., loss of a habitat or conversion of habitat from one type to another during implementation]).

The most immediate and tangible environmental benefit is to the grouper-snapper-grunt populations. Experience has shown that orientation to new structure can occur within hours of an installation. Refuge benefits occur simultaneously with orientation. Food availability benefits may be immediate or may lag pursuant to feeding type. Piscivorous fish will find ready prey in smaller fish which are also orienting to the new structure. Other fish may not find suitable food supply until the structure becomes encrusted with epilithic flora and fauna. Effects on the fish population size will occur over several reproduction cycles but the improved refuge will serve to reduce predation immediately.

Secondary benefits are expected to accrue to the forage and baitfish populations as well as to the shellfish of the area. The experimental installation at Egmont provided habitat for the commercially harvested Stone Crabs but also for a variety of sponges and soft corals. These organisms are often useful in balancing the primary planktonic production with secondary production and habitat for other grazers and planktivores. The net result is a more robust and resilient complex of organisms situated at the boundary between the bay and the Gulf waters.

Economic and Social Benefits (describe the economic and social benefits including those related to the project's improved ecosystem services and any estimates on jobs created or preserved).

Economic stimulation will result not only from the work required to complete the project but also from the increased fish populations. Recreational salt water fishing is a high investment activity requiring proper fishing tackle as well as over water transportation. Fishing is also available at the two associated fishing piers. Both residents and tourists take advantage of these opportunities. In Florida, the number one industry is tourism. Positive recreational fishing activities will support a healthy tourism industry as well as local tackle retailers, manufacturers, and guide services. It is also well known that tourists are more likely to enjoy other activities, such as restaurants, theatre, and other entertainment, when they have had a pleasurable water-related activity, making secondary economic stimulation a major contributor to the economic benefits. Social benefits generally rise with economic prosperity. Economic gains provide for more jobs and better jobs relieving many of the pressures that lead to social collapse, welfare, and crime.

Community Resilience (describe if the project assists Florida's ability to anticipate, withstand, or recover from hazards or threats [e.g. hurricane preparedness, establishing living shorelines]).

The design and location of the reefs makes them very resistant to such natural disasters as hurricanes. Other natural disasters are irrelevant. Having a more available and easily obtainable natural food source at the nearby fishing piers and nearshore reefs such as that provided by a robust local fishery accessible by boat or car (on the piers) may serve to relieve some pressures on other sources of food resupply following a natural disaster.

Conflicts or Complements to Existing Efforts (describe any ongoing activities in the project implementation area, if the project is part of another plan, and why the project does or does not interfere with that work. Please consider how the project may complement existing local, regional, and state efforts/plans/objectives).

The conflicts with the proposal are largely limited to FDOT maintenance needs. These will be avoided by bringing the FDOT engineers into the design process. A secondary conflict may arise from the USCG desires to maintain navigational clearances beneath the hulls of both recreational and commercial vessels. Since the project installation itself will not be a center for fishing, but will supply fish to nearby fishing areas, clearance issues can be avoided with proper navigation charts and caution signs.

Compliments to the proposal are the benefits of the already installed and quite numerous artificial fishing reefs which occur at the Manatee Reef Ball site, the Egmont artificial reef site, and both natural and artificial reefs lying west of Egmont key. While these are numerous, the high profile and construction techniques do not provide the ontogenetically relevant benefits described herein.

Complies with Federal, State, Local and Tribal Laws/Regulations (describe any concerns or potential conflicts).

Permits will be required from the USA Corps of Engineers, the Florida Department of Environmental Protection, and the relevant counties. A positive recommendation must be obtained from commenting (section 7) federal agencies and state agencies. Approval must also

be obtained from the US Coast Guard and the Florida Department of Transportation. The conceptual design is not contrary to the regulations or mission of any of these entities.

Readiness for Implementation (describe if the project has had any design or permitting work started or completed [attach permits or design work]. Please address any issues that may delay start or finish of the project).

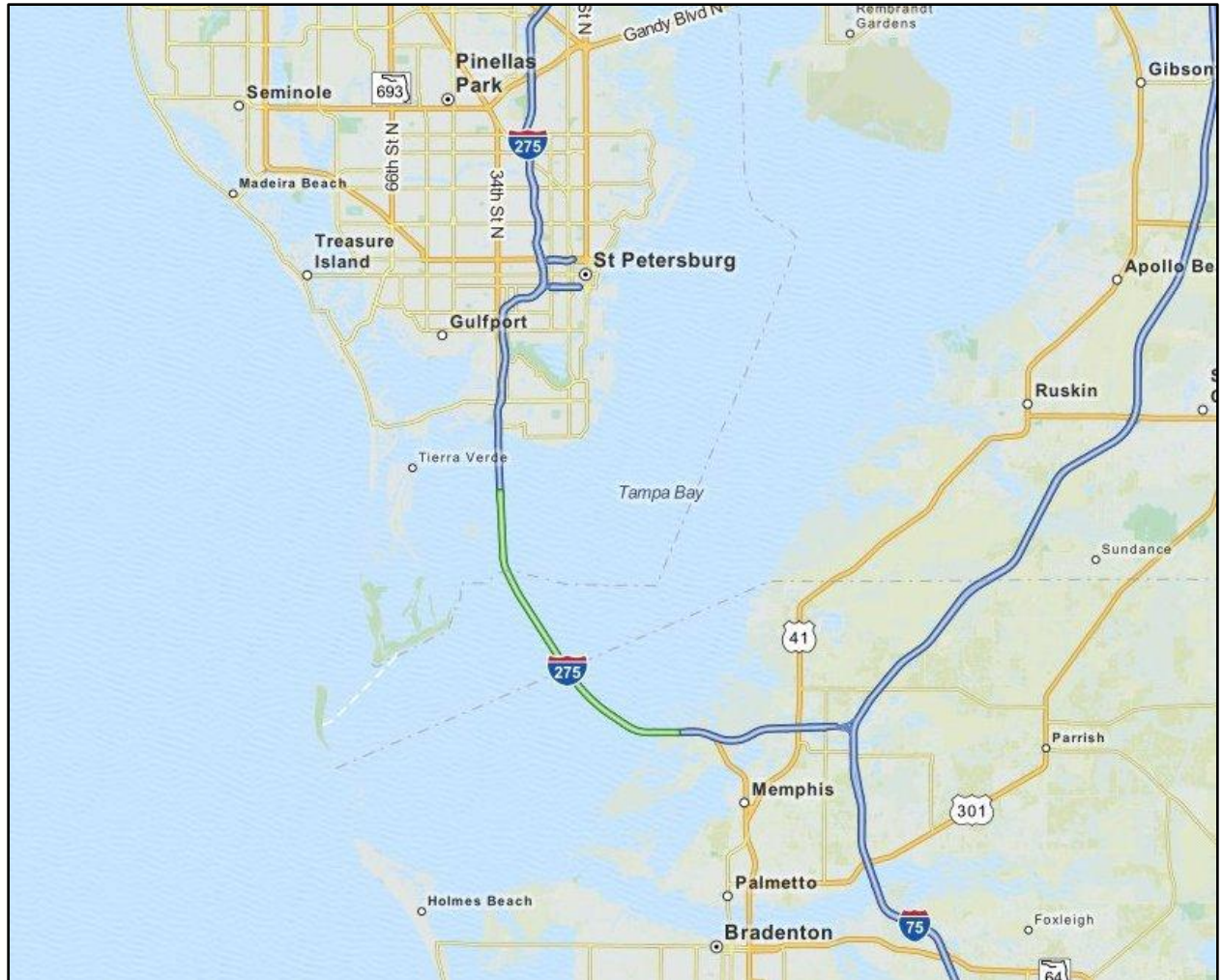
The project exists in a technically proven conceptual stage at this time. Agency approvals and final designs are a task under this application.

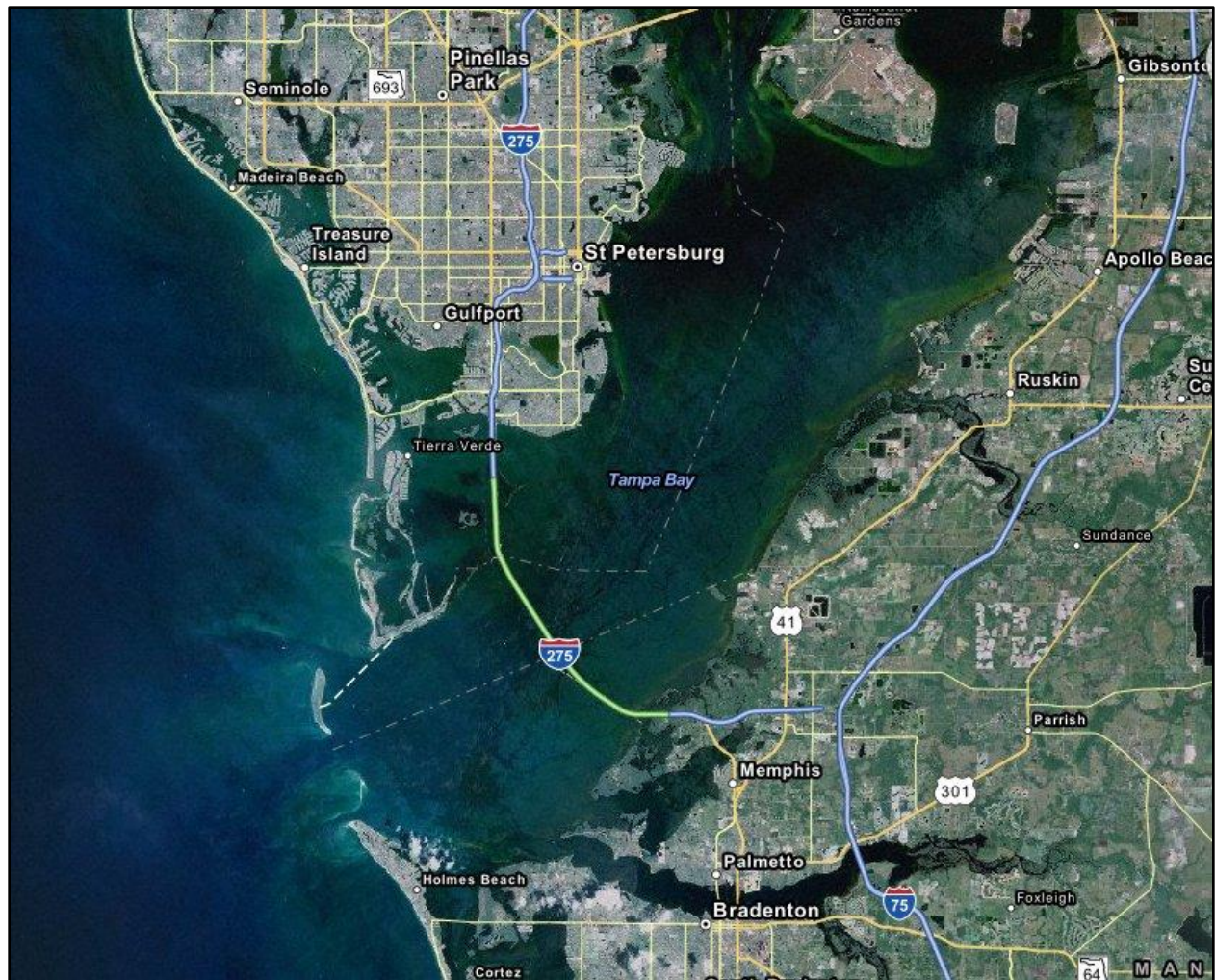
Public Acceptance (describe any known or potential public approval or opposition to the project).

The project is expected to generate widespread public support. Benefits accrue not only to the fish populations but to recreational and commercial interests throughout the region. The concept is also exportable to other suitable estuaries and inlets.

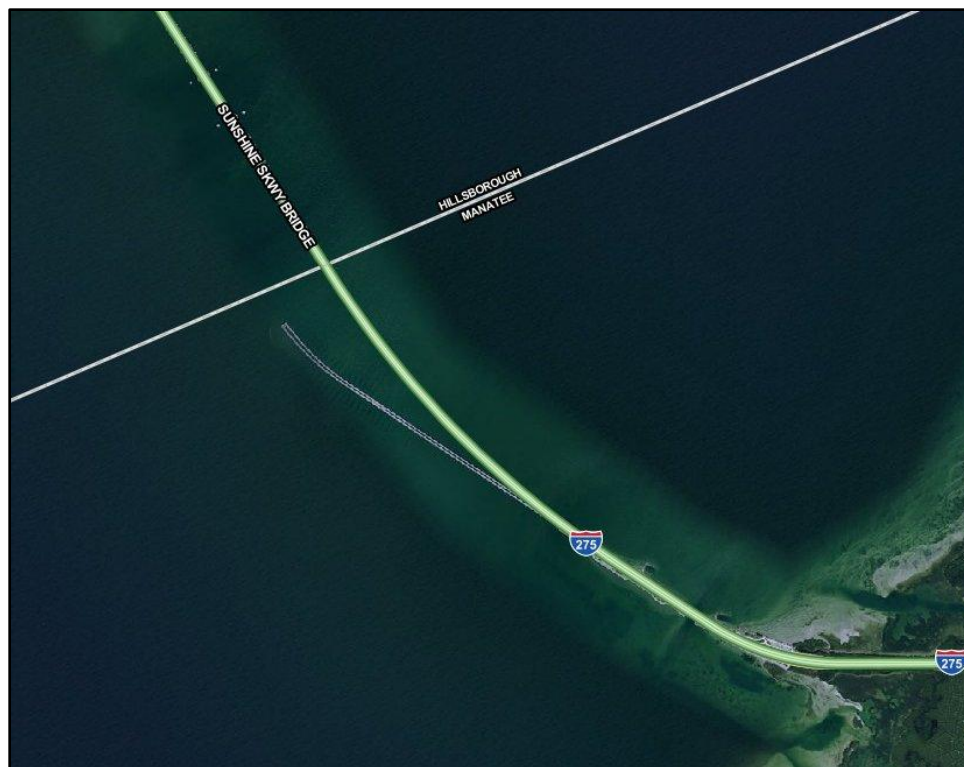
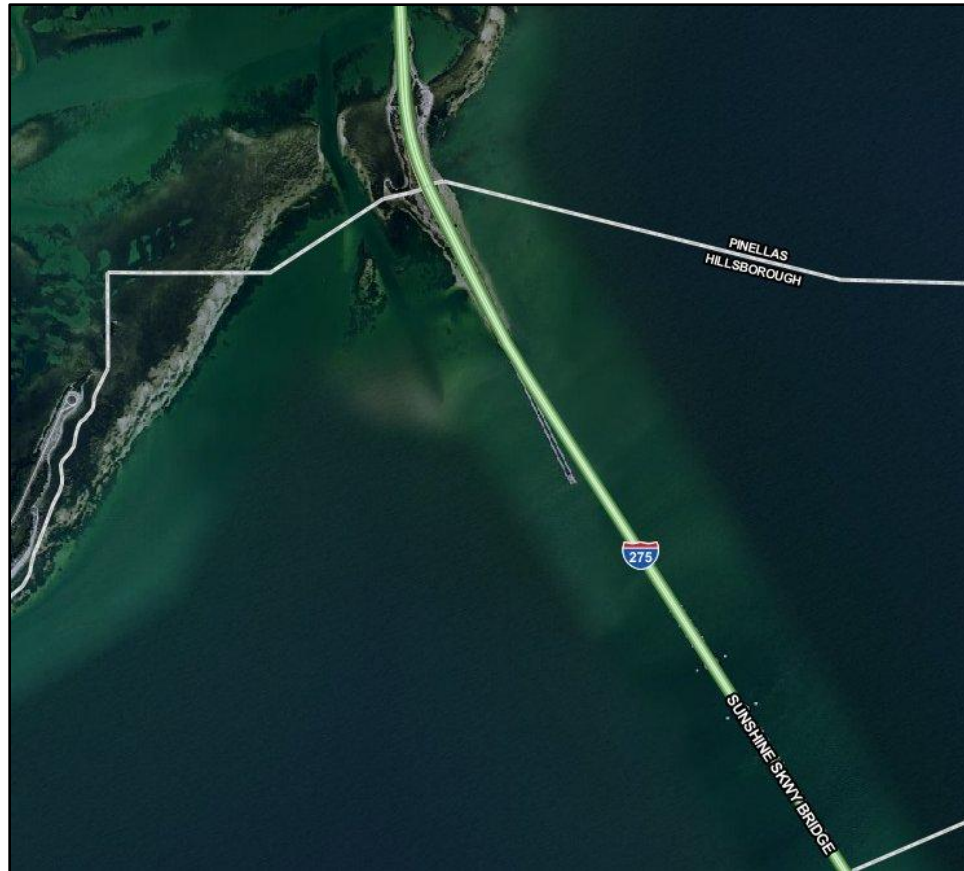
Additional Information you may wish to provide (Please include any maps, designs, drawings, photos, or background resources that may assist in completely and accurately understanding the project):

LOCATION MAP: At the mouth of Tampa Bay, Florida.

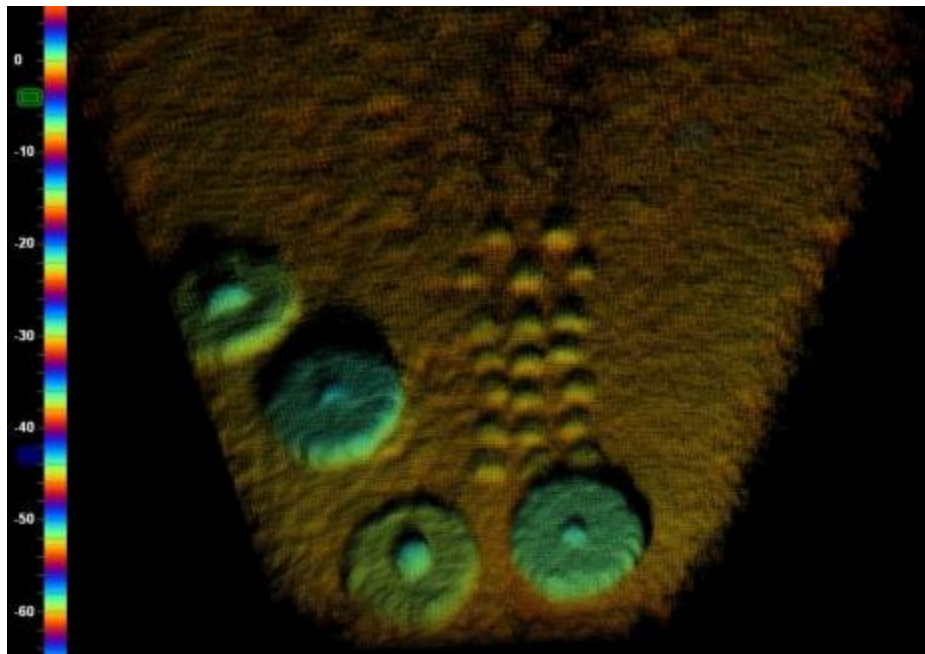




In the image the Skyway Bridge (Interstate 275) crosses the mouth of Tampa Bay connecting Pinellas and Manatee Counties, traversing Hillsborough County submerged lands along the way. Egmont Key, the location of our test site, is located to the west, just south of a westerly line extended from the I-275 icon on the bridge. The installations to provide juvenile and sub-adult habitat are planned for the sections of the bridge which parallel the fishing piers (next images) located on the old approaches to the Old Skyway Bridge which was demolished after being hit by a tanker.



Close up view of fishing piers north (top) and south (bottom).



3D sonar image of the reef installed at Egmont Key



Sub adult grouper on the only remaining natural shallow ledge in Tampa Bay.