American Association of Port Authorities

Alliance of the Ports of Canada, the Caribbean, Latin America and the United States

**2007 ENVIRONMENTAL AWARDS COMPETITION**

# Fantasy Island

## *A Cooperative Restoration, Conservation, and Education Project*


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# 2007 ENVIRONMENTAL AWARDS COMPETITION

***Fantasy Island – A Cooperative Restoration, Conservation, and Education Project***

**c) INTRODUCTION – PAPER HIGHLIGHTS**

Tampa Bay is Florida's largest open-water estuary, encompassing 400 square miles at high tide and incorporating more than 2,200 square miles of watershed. Once the State's most diverse and productive estuarine system, rapid urban and industrial developments have significantly altered the character and ecology of Tampa Bay. But through active bay management, numerous restoration initiatives, industry backing and involved citizenry, the bay is slowly recovering from past indiscretions. In support of bay restoration and education, the Tampa Port Authority (TPA) partnered with our neighbor, The Florida Aquarium (FLAq), and many other port-related entities on the restoration, conservation and education outreach project known as *Fantasy Island*. In May 2006, the TPA and FLAq, along with many of our partners, celebrated the culmination of several years' work as the restoration and education project officially opened to the public.

Mangrove and dredge material disposal islands located throughout the bay have become some of the most diverse and productive bird nesting colonies in North America, supporting approximately 40,000 nesting pairs of at least 25 bird species each season, with many of the avian and other inhabitants listed as threatened or endangered. *Fantasy Island*, as it has been historically known, is a small island created by dredge material (side-cast) adjacent to the Tampa Port Authority's largest dredge material disposal island (Island 2-D which is approximately 500 acres). The island is located in Hillsborough Bay, north of the Alafia River, which is one of the major freshwater tributaries to Tampa Bay. The island and associated submerged land is owned by the TPA as the sovereign submerged landowner in Hillsborough County, Florida.

A top priority of the Comprehensive Conservation and Management Plan for Tampa Bay, created by the Tampa Bay Estuary Program in 1996 and updated in 2006, was the continuing

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education of bay managers and residents about bay issues and the importance of conserving and restoring our natural resources, as well as the development of additional and innovative outreach opportunities. To this end, the TPA formed the partnership with The Florida Aquarium and invited numerous port industries, tenants, businesses, consultants, schools, universities and non-profit organizations to unite and develop the concept of creating an on-the-water environmental educational field station that would illustrate how a healthy bay environment and Florida's largest estuary and Port facility can co-exist and thrive. Thus, the *Fantasy Island Cooperative Restoration, Conservation, and Education Project* was born.

At the start of the project in 2000, *Fantasy Island* was largely overrun by non-native invasive vegetation and was experiencing erosion problems. Distributed by air, land and sea, Brazilian pepper (*Schinus terebinthifoolius*) is one of the most aggressive of the invasive nonindigenous plants in Florida. Introduced in the mid 1800s as an ornamental plant called Florida Holly, Brazilian pepper has invaded aquatic and terrestrial habitats, significantly reducing the quality of native biotic communities by eliminating many indigenous sources of food for wildlife and essentially creating "pepper monocultures" on more than one million acres throughout Florida.

Unlike the other dredge material islands mentioned, which are restricted to public access because they are designated construction sites and/or reserved/listed as bird nesting sanctuaries in conjunction with the National Audubon Society and US Fish and Wildlife Service, *Fantasy Island* will be designed specifically for the purpose of inviting and educating the public about the natural habitats and wildlife which make-up Hillsborough Bay, the major embayment traversed upon entering the Port of Tampa, and how all thrive in the footprint of Florida's largest seaport. The plan

is multi-phase to rehabilitate and enhance the small island and develop an eco-tour program designed for the purpose of educating the public and school groups. It allows visitors to explore firsthand the abundant wildlife that thrives in these habitats when properly managed as natural systems. The Bay Spirit, a 64-foot catamaran vessel shared by the Tampa Port Authority and The Florida Aquarium, is utilized to transport students and the public to the island to participate in the educational programs.

**d) GOALS AND OBJECTIVES**

The primary objectives of the project are: the enhancement of a four-acre dredge material island (*Fantasy Island*) in Tampa Bay through the removal of nuisance/exotic vegetation and the establishment of native communities/habitats and the development of an environmental educational program. These have been accomplished utilizing Port Environmental Department staff, biologists from The Florida Aquarium, business and industry experts and hundreds of hours of volunteer time from various agencies, groups, associations and citizens.

Visitors to Fantasy Island will not only be educated on the habitats and ecosystems of Hillsborough Bay, but also on the importance of protection of bird and wildlife species, especially the endangered Florida manatee (*Trichechus manatus latirostris*) and protected migratory shore and wading birds. In addition, they will be exposed to the fragile balance industry and nature play in managing an international port facility, providing the infrastructure accommodations for shipping, maintaining shipping channels and managing dredged material, all the while protecting the sensitive

ecosystems of Tampa Bay. The following major objectives of the project have been accomplished since project inception in 2000:

- *provided for the restoration and enhancement of a four-acre spoil island which has been negatively impacted by the encroachment of invasive species and erosion;*
- *promoted and developed partnerships formed with The Florida Aquarium, port businesses, and other local organizations;*
- *encouraged the development of a series of habitats (flora and fauna) representative of Hillsborough Bay, including intertidal zones, upland scrub, mangrove forest and salt marsh;*
- *provided education interpretation of the enhanced site through trails, educational signage kiosks and an outdoor covered facility for group programs and the general public;*
- *provided an opportunity for ongoing research and monitoring of the restored habitat;*
- *developed innovative shoreline protection and habitat features including high and low marsh plantings, oyster shell wave breaks, installation of oyster domes, etc.;*
- *developed comprehensive educational programs for high school students and teachers in Hillsborough County and other bay area school systems;*
- *encouraged and explained the beneficial use of dredge material and management to the scientific, regulatory community, school students, and the general public.*

**e) DISCUSSION**

**i) BACKGROUND**

The Tampa Port Authority and The Florida Aquarium have been working in partnership since 2000, to rehabilitate and enhance a small man-made island of approximately four acres. The island is popularly known in the local community as *Fantasy Island*. As previously mentioned, over time the island had become overrun with exotic vegetation and plagued with significant shoreline erosion. The restoration and enhancement activities designed for this project were to create a stand-alone, functioning educational tool, meant for interpreting native local habitats. Microhabitats, or habitat mosaics representative of the types that make up the bay, including inter-tidal zones, upland scrub, mangrove forest and salt marsh were designed, created, and installed.

Funding for removal costs and replanting native vegetation was obtained through a grant from the Gardinier Settlement Trust Fund, administered through the Florida Department of Environmental Protection and the Environmental Protection Commission of Hillsborough County. The fund was established as a way to provide support for restoration and enhancement projects around the Alafia River basin. The funds were awarded in the spring of 2000. Planning, design, and permitting proceeded over the next 12 months.

## ii) OBJECTIVES AND METHODOLOGY

**"A Quick Project Overview"**

The *Fantasy Island* project was accomplished in a serious of phases beginning in 2000. Phase I included vegetation surveys, removal of non-native vegetation, development of a planting plan and installation and maintenance of more than 4,000 native plants. Phase II was the planning, permitting and construction of the dock and education pavilion and interpretive sign development. Phase III was the development of the educational program including the curriculum and eco-tour for the students and teachers. The planning phase (Phase I) of the project took place from June 2000 through May 2001. Mapping of the island's topography and vegetation was initiated in June 2001, by port and aquarium staff and volunteer experts. The actual removal of exotic vegetation was contracted out, using funding provided by the Gardinier Settlement Trust Fund, in the first half of August 2001. Crucial in-kind training support was provided by the United States Coast Guard to transport a 5,000-pound tree chipper by helicopter from the mainland to the island. The Brazilian pepper was cut and mulched and placed into large piles on the island to "cook" in order to deactivate any remaining pepper berries and then used as trail bed material. Plant transport to the island was accomplished by a port dredge/barge company, and planting of native vegetation and initial trail construction took place during the last week of August and first week of September 2001. Deposition of oyster beds and reef balls for shoreline stabilization and planting of saltmarsh grass occurred during November 2001, using port, aquarium and

non-profit organization volunteers. Educational sign and kiosk layout and design was started in Phase I, and installation was completed during Phase II. Phase II permits for construction of a boat dock were received in March 2002; the construction commenced and was completed in June. The educational pavilion facility was constructed shortly thereafter. Monitoring, maintenance and educational modification efforts will be ongoing.

Phase III included development of the public outreach and interpretive/educational programs. A curriculum team was formed that included teachers, TPA & FLAq staff, science advisors, retired educators and an advisory panel that included local experts.

Several teacher workshops were held from 2002-2005, and a marine science exploration program, in association with the School Board of Hillsborough County, began in 2003, with school groups visiting the island. However the curriculum program did not start in earnest until the 2005-06 school year.

Analysis of the physical components of the project were initiated in June 2001, with an examination of existing plant communities and physical characteristics of the island using aerial photographs and GPS/GIS satellite image techniques. Approximately 80% of the island was covered with invasive plant species, primarily the Brazilian pepper. The satellite data was incorporated into site maps that were used as working templates for removal and planting plans. As mentioned, in August 2001, the actual removal process began. Project members had agreed upon using a hand removal technique to minimize impact to the island itself. The removal process was subcontracted to a firm experienced in restoration activities.

The process was completed in approximately three weeks. More than 4,000 native trees, shrubs and grasses were transported by barge to the island and planted by a major volunteer effort (200+) over a three-day period at the end of August 2001. Periodic maintenance is ongoing and includes trail upkeep and removal of re-emerging exotic vegetation. In early November 2001, approximately 50 middle school students planted saltmarsh grass (*Spartina alterniflora)* to help stabilize the southern shoreline of the island, which is exposed to approximately 30-miles of open water fetch. Later that month, deposition of 12 tons of natural oyster shells and artificial reef balls were constructed on the south side of the island. Both efforts were undertaken in order to help with the stabilization of areas subject to erosion, as well as to create additional intertidal habitat for fish and wildlife. Both of these projects were lead by a local non-profit community organization, which partnered in the project.

Permits were required from the U.S. Army Corps of Engineers, Florida Department of Environmental Protection and from the Tampa Port Authority, as the sovereign submerged land owner in Hillsborough County, in addition to a construction permit from Hillsborough County for the upland educational pavilion.

Some of the measurable components of the restoration, conservation and education effort are:

- success of survivorship of replanted vegetation, habitat utilization, and nesting by native bird and wildlife species;
- number of volunteers and hours;

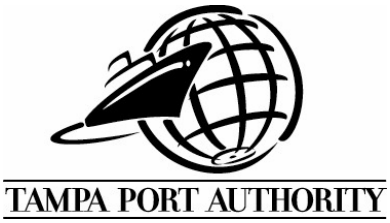
- number of enduring partnerships and financial support;
- number of eco-tour participants;
- formal evaluation of the education curriculum programs.

The educational components include:

- interpretive signage throughout a trail system on the restored island;
- public interpretive programs for visitors to the Port and Aquarium;
- a comprehensive environmental education and marine science curriculum for school students and teachers. Programming will focus on data collection and analysis and include the following topics of study: an overview of Tampa bay, interactions with shipping and the port community, chemistry and geophysical characteristics of the area, study of plants, invertebrates, vertebrates and ecological systems of the area.

The educational outreach program to date:

- 85 teachers have participated in teacher workshops that utilized the island;
- 524 students and 66 teachers have participated in school field trip programs to the island;
- Approximately 150 additional children and adults have visited the island through family programs, AquaCamps (Florida Aquarium camp programs), Scout workshops, and other Port and Aquarium special education events;



- Hundreds of additional volunteers participated in additional plantings, maintenance, and shoreline/island clean-up events;
- Another ~1,800 students are expected to participate in field trips to the island in the next school year (2007-2008), and next summer's camp students will also be traveling to the island for programming. At least one more teacher workshop will be held this fall.

### iii. HOW THE PROJECT FULFILLS THE AWARD CRITERIA

This project has met and exceeded all aspects of the AAPA award criteria in the Stakeholder Awareness, Education and Involvement category, through:

- the restoration and enhancement of a four-acre spoil island which has been negatively impacted by the encroachment of invasive species and erosion,
- the development of a series of habitats (flora and fauna) representative of Hillsborough Bay, including intertidal zones, upland scrub, mangrove forest and saltmarsh,
- educational interpretation of the enhanced site through trails, educational signage and an outdoor covered facility for group programs and the general public,
- an opportunity for ongoing research and monitoring of the restored habitat,
- a comprehensive environmental program for school students, teachers and the public.

The project has resulted in a tremendous number of cooperative partners for all aspects of the project. The collaborative efforts have become intertwined as each partner has become involved in multiple aspects of the project as it has progressed. In addition to The Florida Aquarium, partners include:

- The Florida Department of Environmental Protection and the Environmental Protection Commission of Hillsborough County are participating in the restoration project through funding provided by the Gardinier Settlement Trust Fund;
- Tampa Bay Watch, a local non-profit organization;
- Florida Coastal Islands Sanctuaries-Audubon of Florida;
- TECO Bayside Project (including Tampa Electric, Alstrom Power Inc.'s Customer Service Division and HRSG Sales, GE, ABB Inc., Morris Shea Bridge Co., The Industrial Company, Sargent and Lundry, WWW Gay Mechanical Contractor, SEC/Fisher Scientific, Shoreline Marine, Inter-Bay Marine, and Sims Crane & Equipment Co.);
- GE Fund;
- Garrison Stevedoring, Eller & Co.;
- Tampa Bay International Terminals;
- URS Corporation;
- United States Coast Guard;
- Boy Scouts of America;

- Hillsborough County School District, University of Florida, University of Tampa, Hillsborough County Community College;
- Florida Fish and Wildlife Conservation Commission.

The *Fantasy Island* project is both innovative and creative. It is the first eco-tour island dedicated to habitat restoration and public education and outreach in Florida and perhaps the nation. Visitors will get a first-hand glimpse into hands-on experience about the science and art of habitat creation, nuisance vegetation control, and port environmental management. The benefits to the community resulting from this project came about as a result of a port dredging project. The cost effective placement of dredged material from a planned construction event to create a public island dedicated to environmental education is an idea that other ports could learn from and plan for in their respective communities.

Innovative technologies (GPS/GIS) were used for the initial mapping of the island. While they are standard tools in today's technology for mapping projects, the continued use of this system for the island project has been incorporated into an undergraduate course at the University of Tampa. Students will learn to use the mapping system and will be able to provide information on the progress of the revegetation process and shoreline protection efforts, allowing for comparative studies on identifying appropriate materials for beach erosion problems.

The project has been accomplished and could only have been accomplished though grant funding, business and industry support, and thousands of hours of volunteer planning, labor, and maintenance. Some estimated costs incurred for the project include:

- Exotic Plant Removal - $20,000 (grant funded)
- Native Vegetation - $30,000 (grant funded)
- Island Dock Construction - $40,000 (port industry and business support)
- Educational Pavilion - $35,000 (port industry and business support)
- Trail Construction (volunteer labor)
- Educational Kiosks, Signage & Graphics - $45,000 (port industry and business support)
- Yearly Maintenance – (volunteer labor)
- Curriculum Development (Evaluation, Pilot Testing, Implementation)
- *In-kind support: volunteers, salt marsh planting, oyster bed construction, reef balls, planting efforts.

**f) CONCLUSION**

The Fantasy Island Cooperative Restoration, Conservation, and Education Project is making an environmentally positive impact in a critical region. It is located in the waters of one of the largest US ports, adjacent to major shipping lanes. It will provide a working educational tool for interpreting native Florida habitats. It provides a unique opportunity to integrate educational programming with an ongoing conservation effort. It highlights the environmental management

ideology and contributions of the largest port in Florida It is also exceptional in the number of partnerships that have developed during the process of the project, including members from non-profit organizations, government agencies, private industry and port businesses. The partnerships that have evolved will have a long-term effect on the environmental consciousness of our region.

The project has received tremendous local media coverage, as well as national recognition through the American Zoo and Aquarium Association (AZA). The project was featured on the cover and as part of the main article of the AZA's monthly journal, *Communiqu*e. The article focused on the role of zoos and aquariums in significant restoration processes in North America. In 2002, the Tampa Port Authority/The Florida Aquarium partnership won a prestigious Gulf Guardian award from the Gulf of Mexico Program – First Place in the Partnership Category. In 2004, the project received commendations from the Florida Native Plant Society and was honored with an environmental planning award from the Tampa Bay Regional Planning Council.

The Port of Tampa is an important resource for the Tampa Bay community, providing nearly 100,000 jobs and $8 billion to the local economy. Even more important is the integral role the port plays in the restoration, improvement and protection of the environmental health of Tampa Bay. We strive to ensure that our large-scale enterprises operate safely and responsibly within our fragile coastal ecosystem. Providing the avenue to increase public awareness and education on the day-to-day operation of a large port and its coexistence with the natural environment is the unique nature of this project. As a member of the Tampa Bay community, The Florida Aquarium is dedicated to the conservation and preservation of Florida's aquatic ecosystems. This important project provides a unique opportunity for increasing public awareness of Tampa Bay's unique habitats and the positive

impact made possible by individuals and meaningful collaborations. In addition, the project has created a collective stewardship – a partnership of organizations working for the protection and preservation of Florida's fragile habitats.

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