

## **PROJECT SUMMARY**

Applicant Organization: City of Miami, Florida

Project Title: City of Miami, Recovery Act – Restoring Coastal Miami

Site Location: Virginia Key and Biscayne Bay, Miami, Florida

Virginia Key: 25.742 Lat., -80.163 Long.

Dinner Key Marina (Biscayne Bay): 25.724 Lat., -80.163 Long.

Everglades Watershed (USGS Cataloguing Unit: 03090202)

Land Owner: City of Miami, Florida

On-the-Ground Implementation Start Date: July 31, 2009

Number and Types of Jobs Created or Maintained, Labor Hours, and Duration:

Jobs Created: 73; Jobs Maintained: 66; Total Labor Hours: 243,356; Duration: 18 months

Coastal and Marine Habitats to Benefit from the Project: Virginia Key is a barrier island of approximately 1000 acres located three miles east of downtown Miami and about one mile southwest of the southern tip of Miami Beach. The island is situated between Fisher Island to the north and Key Biscayne to the south; it is connected to the mainland by the Rickenbacker Causeway which traverses the southernmost portion of the key. The park is bordered on the north and west by mangroves, to the south by a commercial complex and to the east by the Atlantic Ocean. This environmentally sensitive land is an important coastal natural area with four distinct habitats: beach, dune, wetland and upland hammock. It includes sea-grass beds and inter-tidal sand/mud flats, mangrove and herbaceous wetlands, beach dune communities and coastal maritime hammock. Located in Biscayne Bay, the Key's shoreline is home to protected nesting sea turtles. The Key is primarily non-residential and remains largely in its natural state.

Dinner Key Marina is located in Biscayne Bay. Biscayne Bay is the largest estuary on the coast of southeast Florida and is contiguous with the south Florida Everglades and Florida Bay. It encompasses a marine ecosystem that totals approximately 428 square miles. Its drainage is 938 square miles, of which 350 are freshwater and coastal wetlands in Miami-Dade, Broward and Monroe Counties.

Project Scope: The City of Miami, located in Miami-Dade County, Florida, is proposing the Recovery Act – Restoring Coastal Miami: Coastal Virginia Key and Other Marine Habitat Restoration Project. This comprehensive project takes an ecosystem-wide approach to coastal and marine habitat restoration and accordingly the City has opted to bundle these initiatives into a single grant application. The project consists of exotic removal and native replanting of coastal wetlands; coastal dune habitat restoration; derelict vessel and associated submerged debris removal; and an educational/outreach component to ensure long-term successes. By addressing the environmental needs of an area with an ecologically broad approach, it will help to ensure a more sustainable and longer-lasting recovery for this unique coastal habitat area that will receive synergistic benefits.

Project Outputs/Outcomes: The project will restore approximately 100 acres of coastal wetlands and .03 acres of bay bottom in Biscayne Bay. An essential barrier island will be restored to environmental health by removing invasive-exotic vegetation and replanting with native vegetation. The original coastal dune area on the eastern side of the island will be restored, which will strategically connect currently fragmented sections of dune habitat thus contributing to a larger system. Marine debris weighing 78 tons will be removed from the bay bottom, thus allowing for the natural regeneration of seagrass to 0.3 acres of bay bottom. The project will create 73 new jobs and maintain 66, strengthening the local economy via employment and increased use of the resources by residents and tourists. The project will support 243,356 labor hours of both new and maintained employment.

Project Time Line: July 2009 through January 2011

Permits and Approvals: The Virginia Key restoration is not anticipated to require extensive permitting. Exotic removal and native replanting will take place above the mean high water line. It is likely that the buoy line installation could require approvals from the U.S. Army Corps of Engineers (ACOE), U.S. Coast Guard (USCG), the Florida Department of Environmental Protection (FDEP), the Florida Fish and Wildlife Conservation Commission (FWC), and Miami-Dade County Department of Environmental Resource Management (DERM). The City has obtained approvals from the ACOE (application #SAJ-2009-772; permit #NW-10); FDEP (Permit Number: DA-576), and DERM (permit ID: 2009-CLI-PER-00047; permit number still pending). The City has already initiated consultations with USCG, FDEP, and FWC; approvals from each are expected by the end of April 2009.

The derelict vessel, barge, and associated submerged debris removal will be aggressively executed and will be able to start within 90 days of grant award. The coordinated efforts between the City and environmental consultant PBS&J, which has extensive experience with the removal of derelict vessels and debris, will allow for the timely execution of grant funding. The proposed contractor has been providing derelict vessel removal services for the entire state of Florida in a program management capacity to the FWC and has a proven track record with this statewide project for removing derelict vessels. Through PBS&J's current work, they have been successful at meeting the De Minimus Exemptions from FDEP and are currently awaiting their USACE Nationwide 22 Permits. It is anticipated that these same approvals will be applicable to the NOAA-funded marine habitat restoration. The City will implement the project in accordance with all applicable federal, state, and local laws and regulations. Further, the City will coordinate with NOAA to ensure full compliance with the National Environmental Policy Act (NEPA).

Federal Funds Requested: \$4,797,273

Non-Federal Match Anticipated: \$5,000 within grant period; \$20,000 for monitoring for four years following.

Overall Project Cost: \$4,802,273

NOAA Coastal and Marine Habitat Restoration Project Grant under the American Recovery and Reinvestment Act (FFO Number: NOAA-NMFS-HCPO-2009-2001709)

## **OVERVIEW OF PROPOSED PROJECT**

The City of Miami, located in Miami-Dade County, Florida, is proposing the **Recovery Act – Restoring Coastal Miami: Coastal Virginia Key and Other Marine Habitat Restoration** Project. This comprehensive project takes an ecosystem-wide approach to coastal and marine habitat restoration and accordingly the City has opted to bundle these initiatives into a single grant application. The project consists of exotic removal and native replanting of coastal wetlands; coastal dune habitat restoration; derelict vessel and associated submerged debris removal; and an educational/outreach component to ensure long-term successes. By addressing the environmental needs of an area with an ecologically broad approach, it will ensure a more sustainable and longer-lasting recovery for this unique coastal habitat area that will receive synergistic benefits.

Miami is a large urban area located directly on the Atlantic coast of southeast Florida. It borders two national parks - Biscayne Bay to the east and the Everglades to the west (map attached). With more than 5 million residents in the metropolitan area, Miami is constantly balancing the needs of the natural and human environments. These conflicting demands must be resolved in a manner that optimizes the value of coastal regions for all. This comprehensive coastal restoration project is unique in that it directly provides benefits to both, through acres of coastal and marine habitat restored and jobs created in the local economy.

The first component of the restoration involves exotic removal and native replanting at various locations on Virginia Key, a natural barrier island located approximately three miles from downtown Miami (map attached). This component will restore approximately 100 acres on the Key, including the restoration of 85 acres of coastal wetland, and 15 areas of hardwood hammock. The restoration will be implemented via labor-intensive hand clearing of exotics and appropriate replanting of native species and will maximize job creation and maintenance. Total costs for this component are \$3,680,291, the overwhelming majority of which are for labor costs, including the 63 new jobs that this task will create.

The second component of this comprehensive restoration effort is the restoration of coastal dunes at two locations along the southeast shoreline of Virginia Key (map attached). This will restore approximately 0.2 acres of coastal dune habitat. The two 1,000 foot dunes will be restored with approximately 15,000 cubic yards of beach compatible sand already on site at Virginia Key. This restoration will strategically connect currently fragmented segments of dune habitat, thus contributing to a larger system. This task will create 13 new jobs and cost \$783,143.

The last component of the ecosystem-wide coastal and marine habitat restoration involves the removal of 15 submerged/derelict vessels (average 30 feet by 10 feet), one barge (estimated 120 feet by 40 feet), and associated submerged debris (typically derelict fishing gear, estimated to cover approximately 3,000 square feet of bay bottom) from the City's Virginia Key and Dinner Key areas and nearby waters in Biscayne Bay. These vessels have been located on the shoreline or submerged in either a wrecked, inoperative or a substantially dismantled condition; of these derelict vessels, 14 are either partially or fully submerged. All vessels to be removed have been

processed by law enforcement in accordance with Florida Statutes and are ready for removal. The City will contract with an environmental consulting firm and a marine contractor to remove these man-made items that are located throughout City waters (map attached) and total approximately 78 tons. This is expected to restore approximately 0.3 acres of marine habitat, maintain 35 jobs, and total \$338,839. The City will be able to use the data gathered from ongoing monitoring already being conducted as part of the mooring field implementation as an in-kind contribution to provide information on this marine habitat restoration component.

To further monitor the results and determine the long-term success of this ecosystem-wide project, the City has partnered with NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) and NOAA’s Southeast Fisheries Science Center (SEFSC) who will conduct project monitoring. The monitoring program will be conducted before, during, and after habitat restoration and quantify the effects of the coastal and marine habitat restoration. The monitoring program will take place both during the grant period and beyond to ensure the continued successes. Monitoring consists of the full suite of physical oceanographic techniques (i.e., shipboard surveys, water samples, moored instrumentation, and satellite-tracked surface drifters). The team will monitor water quality and biological parameters; proposed techniques include weekly water quality sampling, and monthly cruises to measure the nearshore ecosystem health. These costs are included as part of the previously discussed project components.

## 1. IMPORTANCE AND APPLICABILITY

### **ARRA Intent: Readily Maximize Jobs and Improve Economic Conditions**

The implementation of this project will meet the intent of ARRA by promoting economic recovery through the creation of 73 new jobs (211,440 labor hours), the maintenance of 66 jobs (26,504 labor hours), and the investment in environmental protection that will produce significant short and long-term economic benefits. The ultimate objective of this long-term project goes beyond the project implementation period and will support the protection, restoration, management, and sustainability of coastal and marine resources.

According to the U.S. Department of Labor, Bureau of Labor Statistics, February 2009 saw U.S. unemployment at 8.1 percent, the State of Florida at 9.4 percent and Miami at 8.2 percent. Like many areas, Miami is in desperate need of jobs like those provided through this project and will greatly benefit from these Recovery Act funded projects that fuel America’s near-term economy. In accordance with Section 1606 of the American Recovery and Reinvestment Act, the City will ensure that laborers will be paid prevailing wages.

Table 1. Estimate of Jobs Created or Maintained by NAICS Code on Grant Activities

| NAICS Code | Business Activity                       | Labor Hours | Number of People Employed | Grant Funds Allocated |
|------------|---|-------------|---------------------------|-----------------------|
| 562910     | Remediation Site Work                   | 225,364     | 78                        | \$3,184,482           |
| 541990     | Scientific Services                     | 9,792       | 3                         | \$160,704             |
| 23891      | Site Preparation Contractors            | 280         | 10                        | 18,596                |
| 541330     | Marine                                  | 3,312       | 39                        | \$359,089             |
| 543160     | Surveying                               | 80          | 2                         | \$15,000              |
| 541690     | Scientific Services                     | 400         | 3                         | 405,000               |
| 924120     | Administration of Conservation Programs | 4,128       | 4                         | \$93,730              |

|  |               |                |            |                    |
|--|---------------|----------------|------------|--------------------|
|  | <b>TOTALS</b> | <b>243,356</b> | <b>139</b> | <b>\$4,236,301</b> |
|--|---------------|----------------|------------|--------------------|

The short and long-term economic conditions of the area will be improved in a number of ways by serving both residents and tourists (there were 12 million visitors to Miami-Dade County in 2007, representing \$17.1 billion in revenue):

- The restored area will attract greater numbers of eco-tourists and recreational residents to the site to experience sub-tropical Florida in its natural state. Over 200 million Americans – approximately 70 percent of the entire U.S. population – visit coastal habitat annually for vacation, recreation, sport, or sightseeing (<http://www.nmfs.noaa/habitat/restoration.html>).
- A federally recognized historic site, Historic Virginia Key Beach Park (82.5 acres) is listed in the National Register of Historic Places (2002) and has a Florida Historical Marker. It was once a racially segregated beach and the only coastal area Miami’s African-American population could legally enjoy. The Park was re-opened in February 2008 and is working to revitalize the site as a gathering place, natural area, and interpretive center for both environmental and historic educational programming. The habitat restoration will contribute to these goals, increase long-term employment at the Historic Park and the City’s Park (49.5 acres), educate the public, and provide this venue to families and visitors.

These coastal and marine habitat projects are shovel ready (i.e., planning is complete, approvals are secured, and people could be put to work right away once funding is in place), are estimated to directly create 73 new jobs (211,440 labor hours), maintain 66 jobs (26,504 labor hours) at a cost of \$4,236,301 in salaries and fringe benefits and \$565,972 in supplies and equipment and will begin within 90 days after grant award and will be completed in 18 months.

Marine habitat restoration indirectly supports unique ways of life dependent on the marine environment’s diversity. For the more than 110 million Americans who live near the coast, their quality of life depends on a healthy marine ecosystem; it influences scenic beauty, recreational opportunities, and mere presence. Marine restoration will help to maintain these ways of life for the benefit of both current and future generations.

### **Ecological Benefits and Performance Measures**

A vital natural resource to south Florida, Virginia Key is a 1,000-acre natural barrier island located approximately three miles from downtown Miami with approximately 2.6 miles of shoreline. Prior to the creation of Government Cut (1902) Virginia Key was part of a larger contiguous barrier island system, and was historically connected to Miami Beach. In the 1950s, Dade County constructed a sewage treatment plant on Virginia Key. Beginning in the late 1940s through the 1980s significant dredging and filling projects that included the construction of Rickenbacker Causeway and the dredging of Marine Stadium basin, transformed the natural areas within the Key. Spoil material from the Port of Miami dredging was disposed of on northern Virginia Key, causing an estimated 185-acre loss of valuable coastal habitat.

The Miami’s Virginia Key and Dinner Key waters and anchorage areas have served local and transient boaters for over 100 years. During the early 20<sup>th</sup> century Florida’s population exploded; between 1920 and 1924 alone, Miami’s population more than tripled from 30,000 to 100,000. In those years, Miami’s waters and anchorages have accommodated transient vessels, liveboards,

and served as an on-water storage area for thousands of boat owners. The impact of this growth on South Florida's habitats has been enormous. For example, motorboats account for a high percentage of Manatee deaths each year. Offshore, illegal anchorage and boat collisions in shallow water damage submerged aquatic vegetation and cause mudding of the water, which screens out light. As Florida's staggering population growth continues so will the impact to the marine environment.

Past practices can be alleviated through restoration, defined as the process of reestablishing a self-sustaining habitat that closely resembles the natural condition in terms of structure and capacity. The goal of restoration is to expedite the natural processes in rebuilding a healthy, functioning natural ecosystem that works like it did before it was polluted or destroyed in terms of clean water and healthy habitats. Habitat restoration is essential as healthy habitats support fish and wildlife, as well as human uses such as swimming, diving, boating, and recreational and commercial fishing.

Although there has been some limited development on Virginia Key, it is non-residential and is largely publicly owned (by both the City and Miami-Dade County). Although it is located within close proximity of a major metropolitan area (the Miami-Dade County population of 2,387,170 makes it the most highly populated county in the State), it remains one of the last principally undeveloped coastlines in the area. However, as with many other undeveloped coastal areas in South Florida, Virginia Key is subject to particularly intense development pressure. Thus, this project will have important benefits for fish and wildlife habitat. Over the last decade, the City has made major efforts to work with Miami-Dade County and U.S. Army Corps of Engineers to restore the coastal habitat to its natural state, focusing on the removal of invasive-exotic plant materials from the coastline and fresh water wetlands. A labor-intensive process, there is still much more to be accomplished.

When derelict vessels are left unattended, the influence of winds, waves, and tides may continue to relocate the boats causing greater impacts as they become more deeply mired into the benthos, or moved to other areas where smothering and crushing of critical habitats will occur. Early extraction of derelict vessels is required in order to avoid and minimize the environmental impacts caused by their long-term presence in the marine environment.

In addition to the physical impacts resulting from the movement of derelict vessels through the environment, there is the long-term effect caused by their continued degradation and decay in marine habitats. Vessels may be constructed of various materials, having varying degrees of resilience and can remain in the marine environment for extended periods of time. With the progression of time, the environmental impacts increase from shading and the shading from the hull and displacement of live bottom and emergent vegetative communities resulting from the expansion of the debris field as the vessels disintegrate.

Coastal and marine habitats provide food and water for species to grow and survive, and shelter for marine life to hide from predators. Habitats also serve as critical breeding and spawning grounds. Some marine species are transient and use several different habitat types throughout their life cycles. Habitats are essential to the survival and productivity of fish species. These coastal and marine habitats support valuable fisheries and protected resources, improve water

quality, provide public recreational opportunities and enjoyment and buffer Miami from the impacts of storms and sea level rise. The ecologically broad project areas are all located within in the Everglades Watershed (USGS Cataloging Unit: 03090202) <http://cfpub.epa.gov/surf.html>. Due to its intrinsic value, the project will benefit NOAA trust resources such as sea turtles and essential fish habitat including seagrass beds and mangroves. The following coastal and marine habitat types are anticipated to directly benefit from this coastal Miami habitat restoration project:

**Coastal Wetlands and Mangroves.** Salt-tolerant mangroves are specially adapted to tidally flooded coastal areas. The daily tides flush and replenish water supplies and are critical to mangrove ecology. Mangroves are unique in that they can withstand the physical impact of wind, especially when related to tropical storms and hurricanes and recover quickly. The prop roots of the red mangroves create a complex microhabitat, important for providing sanctuary for young marine organisms, many of which are commercially valuable as adults. Mangroves can provide unique roosting, nesting, and foraging sites for herons, egrets, Roseate Spoonbills (*Ajaia ajaja*), White Ibises (*Eudocimus albus*), Brown Pelicans (*Pelecanus occidentalis*), and other shorebirds. Migrant land birds use coastal habitats as they travel. Through the exotic removal (typically Australian pine (*Casuarina equisetifolia*), which inhibits the growth of native vegetation and has a root system that gives the tree a distinct competitive edge) and Brazilian pepper (*Schinus terebinthifolius*) the habitat restoration will allow for a naturally restored hydrologic connection to the Bay. Natural recruitment of mangroves will allow for natural tidal flooding of wetlands.

**Tropical Hardwood Hammock.** Established on older dunes that have become stable enough to allow trees to grow, tropical hardwood hammocks support a diverse plant population. Many birds, particularly migratory species, take advantage of the relatively cool interior and slightly higher elevation provided by hammocks. Coastal hammocks in South Florida are in rapid decline because their well-drained soils and relatively protected setting makes them prime habitat for development. Once prevalent in South Florida, coastal hardwood hammocks can be overrun with exotics such as Brazilian pepper, which outcompetes native vegetation due to its tolerance of extreme moisture and salinity and its allelopathic (“smothering”) effects on neighboring plants.

**Coastal Dunes and Beaches.** The beach and dune community is found along the shoreline, and is formed by rigorous wave activity and wind depositing sand. Dunes provide habitat for a number of plants specially adapted to the saline environment. In addition to restoring the natural functions of a barrier island, the restored dunes will provide for erosion protection. These living shorelines lead to increased resiliency and protection of coastal communities while supporting ecological goals. Like mangroves, coastal dune systems stabilized by vegetation are able to withstand storm force winds. These habitat types are constantly transformed by wind, storms, and tidal activity. However, sea oats secure their own habitat through their deep anchor roots and extensive network of shallow, root-like rhizomes. Dunes provide ideal nesting habitat for coastal bird species, such as gulls, terns, and shorebirds. Beach areas provide nesting for sea turtles.

**Sea Turtles.** Marine sea turtles are currently found in the project vicinity. The NMFS/SEFSC/Protected Resource Division reported sea turtle nesting activity to the Florida Fish and Wildlife Conservation Commission (FWC) in the “Turtle Nesting on Virginia Key and Historic Virginia Key Beach Park.” The results from 2005 to 2008

nesting seasons indicate a total of 187 nests for the loggerhead sea turtle (*Caretta caretta*). The largest threats to nests were negative impacts from erosion, accretion, inundation, and storm-related events.

**Seagrass Beds.** Seagrass habitat is prevalent in Biscayne Bay which is the primary contributing factor to clear and clean water that attract so many people. Lush seagrass beds found offshore help stabilize shifting sediment of the ocean and bay bottom, maintain water clarity, and are home to a vast array of marine life. There are a wide variety of seagrass dependent marine species that would benefit from restoration, include recreationally and commercially important species of fish: bonefish, tarpon, snapper, pompano, permit, sea trout, and a wide variety of grouper. Many species, such as the Florida spiny lobster, pink shrimp, crabs and small fish depend on this habitat for food, shelter and protection. When mature, these species account for over 70 percent of Florida’s commercially harvested marine species. This submerged aquatic vegetation also serves as a food source for the West Indian manatee. Short-term marine habitat benefits are the increase in seagrass density. In the longer term, restored seagrass populations will have the capacity to recover from future damages, if any. Boats and other personal watercraft propellers are the main source of damage to shallow seagrass meadows in Biscayne Bay ([http://www.epa.qld.gov.au/nature\\_conservation/habitats/marine\\_habitats/seagrass.html](http://www.epa.qld.gov.au/nature_conservation/habitats/marine_habitats/seagrass.html)).

**Other Habitats.** The only living coral reefs in the continental U.S. occur off southern Florida and the Keys. Although there are no corals directly in the project area this ecosystem will receive ancillary benefits from the improved water quality in the bay resulting from project implementation. Many important reef species directly use Biscayne Bay and inshore habitats as nursery and juvenile forage areas before migrating offshore to the coral reefs. This ecosystem contributes to the “bay to reef” ontogeny for many important coastal fishes and shellfishes, and there is a direct linkage between life stages and coastal habitat environments extending from the mangrove shoreline, to seagrasses, to patch reefs, and to the open ocean.

Habitat restoration strives to beneficially affect the ecosystem as a whole, supporting numerous species through a single restoration effort. Coastal and marine habitats are the second major source of biodiversity on the planet (<http://www.nmfs.noaa.gov/habitat/restoration/about.html>). Restoring diverse coastal and marine habitats provides for healthy flora and fauna populations, including endangered/threatened species, maintaining ecological balance in natural ecosystems.

In addition to species listed above, the following marine plants and mammals (endangered, threatened, or protected under NOAA jurisdiction) may be found in the project vicinity:

- Dusky shark (*Carcharhinus obscurus*)
- Spotted eagle ray (*Aetobatus narinari*)
- Goliath grouper (*Epinephelus itajara*)
- Smalltooth sawfish (*Pristis pectinata*)
- West Indian manatee (*Trichechus manatus*)
- Johnson’s seagrass (*Halophila johnsonii*)

Johnson’s seagrass has been found growing only along the coastline of southeast Florida between Sebastian Inlet and north Biscayne Bay, and is listed as threatened under the Endangered Species Act. Although Johnson’s seagrass is not found within a mile of the Dinner Key area, the overall health of the seagrasses of central Biscayne Bay play an integral part in water quality of the region to support this protected species.



This project will directly realize significant ecological gains. NOAA's mission to protect and restore marine and coastal habitats will be met by the project's ability to restore 100 acres of coastal and fresh water wetlands through invasive exotic removal and native replanting (15,528 individual plants and trees native to the island), the reestablishment of 2,000 feet of coastal dune and the associated planting of 30,000 sea oats (*Uniola paniculata*), and the removal of 78 tons of submerged marine allowing for the natural reestablishment of 0.3 acres of seagrass.

Ecological performance measures will be directly measured in acres restored. The exotic removal and native replanting will restore a total of approximately 100 acres (85 acres of coastal wetland and 15 acres of tropical hardwood hammock habitat). Dune restoration is anticipated to restore approximately 0.3 acres of habitat. Additionally, it is anticipated that the removal of 78 tons of debris (derelict vessels, submerged barge, and associated submerged debris) will restore 0.3 acres of marine habitat. The impacts resulting from the removal of these vessels during any stage is less than the impacts caused by the long-term presence of the vessel in the marine environment. Therefore, the early detection and removal of abandoned and derelict vessels is the best means of minimizing the individual or cumulative impacts to the environment. Not only will this project restore marine habitat but it will also directly improve the recreational aspects by removing hazards to navigation, improving water quality, and recreational fishing conditions.

Strategic pre-, post-, and during monitoring will verify and detail the impact on the status of listed species or species of concern. The project will directly improve the habitat for NOAA's critical resources, such as the loggerhead sea turtle (*Caretta caretta*) which currently nests on the Virginia Key Beach. It is anticipated that other seagrass and mangrove-dependant species such as the West Indian manatee will benefit through the reestablishment of seagrass and mangroves.

### **Sustainability**

The project will be sustainable and provide lasting benefits of regional significance for the coastal and marine habitats of Biscayne Bay. Miami is committed to safeguarding and restoring the natural environment through stewardship that will continue for decades beyond the 18-month grant period, as expressed in the recently adopted master plans for Virginia Key Park and Historic Virginia Key Beach Park (HVKB). The City owns all land on Virginia Key where the proposed project will take place. The 82.5 acres that comprise HVKB are considered as contributing components of the site's National Historic Register designation and will be protected as such in perpetuity. Other areas of the Key to be restored in this project are valuable resources within the City's parks system. The City, whose park system was established with the founding of Miami in 1896, is dedicated to maintaining and retaining these areas as unspoiled, natural parkland. (Please see attached letter of commitment.)

Removing invasive exotic plant species and replanting with original native species will allow those areas to return to a balanced ecosystem that will support and increase associated native wildlife. To protect against reoccurrence of invasive vegetation, the City, assisted by Miami-Dade County, will monitor the restoration sites during the project implementation and beyond the grant period. The City currently monitors the health of replanted native vegetation. The program identifies and removes recurring invasive saplings and sprouts in restored areas; the

City will expand this program to include the 100 acres of newly restored habitat accomplished by this project. New jobs created will allow for a vigilant canvassing of the area to detect invasives.

Reestablishing the original coastal dunes and planting with native sea oats will allow the dunes to become a self-sustaining resource. The healthier and more robust native plant materials and dune will improve coastal resiliency and protect the Key from storm-related damage. The restored dune areas will be self-sustaining in that it is designed in accordance with the restricted public access of the specific areas. The dunes will have designed walkovers (ropes and signage) that will direct the public to specific locations. Sea oats will be planted on the remainder of the dunes, allowing for little to no maintenance and additional dune longevity. Past environmental degradation has been abated to allow for successful restoration.

In addition, a bathing beach has been established on the east shore of Virginia Key and the presence of lifeguards will help to encourage bathers to restrict their swimming to this area. The shoreline immediately to the south of that beach will have posted restricted public access. The 9,000-foot long buoy line installation planned for the eastern edge of the island will establish a protective area for bathers to the north and seagrass areas to the south. This new buoy line will keep motorized boaters out of these areas and prevent them from running through the seagrass areas and up onto the beach, currently an ongoing problem on Virginia Key.

Derelict and abandoned vessels and the debris associated with these vessels and others stored in these anchorages have contributed to an environmental nuisance with measureable impacts to Biscayne Bay. In order to restore the natural system and prepare the Dinner Key site to become a municipal managed mooring field and ultimately a world class boating destination, the derelict vessels and marine debris will need to be removed from these areas, allowing seagrasses to return to a more natural, unimpeded state.

The physical removal of 78 tons of derelict vessels and associated debris will allow the self-sustaining return of seagrass to historic seagrass areas and accomplish the goal of returning the bay bottom to health. Further, the development of the City's new 225 vessel mooring field will improve properly secured boats and drastically reduce the likelihood of reoccurring derelict vessels. The City will monitor the areas around Dinner Key derelict vessel and associated marine debris removal areas will be monitored by the City and will be part of the City's local cost share in the amount of \$5,000 every year for the next five years. Finally, public education and outreach will ensure that generations to come will realize the benefits of restoration and preservation.

## **2. TECHNICAL/SCIENTIFIC MERIT**

### **Implementation Plan**

The City's Recovery Act – Restoring Coastal Miami is truly a technically sound "shovel-ready" project. Based on previous experience with similar projects in these areas, extensive permitting is not anticipated. Any permits and/or approvals, if required, will be obtained expeditiously. All work will begin within 90 days of the grant award start date and will be completed within 18 months. The anticipated project timeline is as follows:

| <b>Dates</b> | <b>Activity</b> |
|--------------|-----------------|
| May 1, 2009  | Grant award     |

|                                      |   |
|--------------------------------------|---|
| May 2- July 30, 2009                 | Hiring staff and securing contracts for monitoring work and heavy equipment operators   |
| July 31, 2009                        | <b>On-the-ground implementation</b> to begin at both parks on Virginia Key and implementation of derelict vessel removal component  |
| August 2009                          | AOML to establish baseline for monitoring in all four areas of focus (See Project Monitoring)   |
| End of August 2009                   | Implementation of derelict vessel removal component complete  |
| September 2009 – December 2010       | AOML to conduct monthly one-day cruises to monitor coastal and marine environment and microbial water quality. AOML to conduct monthly field studies to assess nearshore ecology and juvenile fish. |
| September 2009 – December 2010       | AOML will conduct weekly assessments of wetland and beach area water quality.   |
| October 2009 – December 2010         | AOML will conduct tests bimonthly to assess nearshore fish population surveys.  |
| End of July – End of October 2009    | HVKBP begin and complete dune restoration, grading and leveling, planting native vegetation, and creating dune walkover.  |
| End of July – End of October 2009    | Exotic removal, debris removal and native replanting on approximately nine acres.   |
| December 2009 – End of February 2010 | Exotic removal and native replanting of tropical hardwood hammock on approximately 16 acres.  |
| January – Early March 2010           | Buoy line installation at shoreline to protect seagrass and keep boats from coming ashore.  |
| December 2009 – End of February 2010 | Exotic removal, debris removal and native replanting on approximately 16 acres to improve mangrove vegetation areas.  |
| March – July 2010                    | Exotic and debris removal and native replanting on approx 16 acres.   |
| September – November 2010            | Exotic removal, debris removal and native replanting on approximately 10 acres in freshwater pond area.   |
| November – Mid-January 2011          | Exotic removal, debris removal and native replanting on approximately 20 acres via selective hand clearing  |
| Early August 2009 - December 2010    | Exotic removal of coastal and outer island areas; assemble shade house for native plant nursery and tend plants.  |
| December 2010                        | Contractor to monitor results of bay bottom debris removal and produce report for City.   |
| End of January 2011                  | AOML to publish monitoring findings   |
| End of January 2011                  | Final Reporting to NOAA   |
| End of April 2011                    | Grant close out   |

The Virginia Key restoration is not anticipated to require extensive permitting. Exotic removal and native replanting will take place above the mean high water line. It is likely that the buoy line installation could require approvals from the U.S. Army Corps of Engineers (ACOE), U.S. Coast Guard (USCG), the Florida Department of Environmental Protection (FDEP), the Florida Fish and Wildlife Conservation Commission (FWC), and Miami-Dade County Department of Environmental Resource Management (DERM). The City has obtained approvals from the ACOE (application #SAJ-2009-772; permit #NW-10); FDEP (Permit Number: DA-576; see attachments), and DERM (permit ID: 2009-CLI-PER-00047; permit number still pending). The City has already initiated consultations with USCG, FDEP, and FWC; approvals from each are expected by the end of April 2009.

The derelict vessel, barge, and associated submerged debris removal will be aggressively executed and will be able to start within 90 days of grant award. The coordinated efforts between the City and environmental consultant PBS&J, which has extensive experience with the removal of derelict vessels and debris, will allow for the timely execution of grant funding. The proposed contractor has been providing derelict vessel removal services for the entire state of Florida in a program management capacity to the FWC and has a proven track record with this statewide project for removing derelict vessels. Through PBS&J's current work, they have been successful at meeting the De Minimus Exemptions from FDEP and are currently awaiting their USACE Nationwide 22 Permits. It is anticipated that these same approvals will be applicable to the NOAA-funded marine habitat restoration. The City will implement the project in accordance with all applicable federal, state, and local laws and regulations. Further, the City will coordinate with NOAA to ensure full compliance with the National Environmental Policy Act (NEPA).

### **Socioeconomic Feasibility and Evaluation Parameters**

In addition to long-term ecological habitat improvements, the Recovery Act – Restoring Coastal Miami Project will bring social and economic benefits for the Miami community. This project is designed to fuel America's near-term economy. Specifically, this project will create 73 new restoration-related jobs (211,440 labor hours) and maintain 66 jobs (26,504 labor hours) at a cost of \$4,802,273 in salaries and fringe. The derelict vessel removal component will maintain and estimated 35 local people from several companies within the private sector and provide a direct economic benefit of \$338,839 to Miami's local economy. Further, in accordance with Section 1605 of the American Recovery and Reinvestment Act, the City will purchase American iron, steel, and manufactured goods, whenever applicable.

Socioeconomic benefits of the healthy environment created through this project abound.

Restoring this precious natural resource, which has an incalculable economic and biological value, involves restoration of 85 acres of wetlands. The estimated value of all economic benefits generated by a single acre of wetland is \$150,000 to \$200,000 (Trust for Public Land, *The Economic Benefits of Parks and Open Space*, 1999). This amounts to approximately \$12.7 million in economic stimulus from the project.

Access to parks and open space has become an important way to attract businesses and residents by guaranteeing both quality of life and economic health. Owners of small companies ranked recreation/parks/open space as the highest priority in choosing a new location for their business (Trust for Public Land, *The Economic Benefits of Parks and Open Space*, 1999).

This coastal restoration effort will quickly and smartly pump funds into the local economy. Not only will the City utilize local government staff and law enforcement personnel, but also local consultants, marine construction contractor, trucking firms, and waste haulers. By returning and investing funds back into the local economy, these involved businesses and the people they employ will benefit from the long-term ripple effects of such a substantial federal investment.

Beyond the short-term plan to develop a sustainable managed mooring field at Dinner Key that offers desirable facilities and a strong sense of community, the City can more effectively promote Miami as a world-class boating destination for the sailing and boating public. Previous studies of the long-term benefits of the environmentally friendly anchoring systems to be utilized

have demonstrated significant improvement in regeneration of previous habitat and resources (i.e., Key West, Florida). The combined development of environmentally friendly amenities and returning the area back to its natural, pristine condition will encourage boaters to return again and again, further positively contributing to the local Miami economy and the region.

There are 28 million jobs in the fishing, tourism, and recreational boating industries – all of which depend on healthy coastal habitats for their customers and production. Estuarine and coastal waters provide essential fish habitat for 75 percent of national commercial fish catches and 80 to 90 percent of the recreational fish catches ([www.nmfs.noaa.gov/habitat/restoration/about.html](http://www.nmfs.noaa.gov/habitat/restoration/about.html)). This project will directly provide for increased fisheries benefits, and indirectly provide for increased recreation and tourism.

Tourism to the area will increase, drawn by the restoration of this coastal habitat in Miami, and easier navigation on the waterways. A nationwide \$502-billion tourism industry is one of the country's largest employers, supporting 7 million jobs, and provides on-the-ground, local benefits. Wildlife watchers spent \$29.2 billion on trips, equipment, and other expenditures in 1996, according to the U.S. Fish and Wildlife Service. The enhanced health of Biscayne Bay is inextricably linked to the financial health of the City, drawing hundreds of thousands of visitors and residents annually to enjoy all the amenities of a functioning waterway (boating, fishing, waterside dining, etc.).

Project success will be measured through:

- 1) **Jobs.** 73 new restoration-related jobs will be created, and will be measured through the City of Miami's Department of Employee Relations. The City will continuously collect data on the positions created, filled and retained, by NAICS code, labors hours worked, and salaries, fringe benefits and consultant fees paid through this funding, on a quarterly basis.
- 2) **Economic benefit of number of acres restored.** The City will quantify the economic benefit of habitat restoration, based on number and type of acres restored, using prevailing calculations of value, on a quarterly basis.
- 3) **Tourism impacts.** The City will monitor impacts through head counts and surveys, on a quarterly basis, by establishing a baseline for tourism to Virginia Key and Dinner Key, and monitoring increases throughout the project period.

### **Biological and Engineering Technical Feasibility and Evaluation Parameters**

The proposed restoration techniques and methods for coastal wetlands and dunes are proven and technically sound. The hand removal of exotic vegetation and restoring coastal dune with on-site compatible sand have been used extensively in the past and continue to be the standard for future City work. It is the goal of the City to restore as much of the original habitat as possible.

Restoring native species will strengthen the ecosystem and help to stabilize the shoreline.

Virginia Key has a strong long-term conservation need since the island contains a variety of upland and wetland plant communities and coastal marine hammock. Research documents the importance of coastal habitats to local fisheries, food web relationships, habitat value and shoreline stabilization. The project directly addresses two "High Priority Habitats under the Greatest Threat" as identified in the Florida State Comprehensive Wildlife Conservation Strategy: beach/surf zone and coastal strand. The Strategy also delineates "invasive plants" as one of only five "Highest Priority Statewide Threats" with which this project is directly aligned.

The City, Miami-Dade County, the State of Florida, and the U.S. Army Corps of Engineers have identified the island as a critical resource. The City created local ordinances that acknowledge and protect the intrinsic value of the Virginia Key ecosystem. Per City Code Section 17-31, in recognition of the need to preserve and protect such areas, Virginia Key has been designated an Environmental Preservation District (EPD) due to the extraordinary educational, historic, environmental, and ecological importance to the welfare of the general public of the city. All development activity in an EPD is reviewed by the City's preservation officer and a certification of approval is required before a tree removal or building permit is issued. For these reasons, Virginia Key is an important environmental, cultural, and educational resource.

The City has conducted ecologically focused initiatives on Virginia Key that have been and will continue to be a priority for the City and the Trust. Past collaborative partners that have provided either technical advisory, partnerships and/or funding have included: the U.S. Army Corps of Engineers, Florida Inland Navigation District (FIND), Miami-Dade County Department of Environmental Resource Management (DERM), Florida Trust for Public, Florida Department of Environmental Protections (FDEP), and the Florida Fish and Wildlife Conservation Commission.

Since August 2003, the City, in collaboration with the Florida Fish and Wildlife Conservation Commission and regional and local marine law enforcement, has removed over 350 sunken, derelict, and abandoned vessels from Biscayne Bay. This effort has removed approximately 525 tons of wrecked vessels and associated submerged debris for a total of \$425,280 (average cost \$1,372 per vessel). All vessels to be removed have been processed by law enforcement in accordance with Florida Statutes and are ready for removal. The derelict vessel removal will be conducted according to the Best Management Practices (BMPs) –attached.

### **Monitoring Plan**

The City has partnered with NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) and NOAA's Southeast Fisheries Science Center (SEFSC) who will conduct comprehensive project monitoring to determine the long-term success of this ecosystem-wide project. AOML is one of NOAA's Oceanic and Atmospheric Research (OAR) Facilities. AOML's mission is to conduct basic and applied research in oceanography, oceanic chemistry, and other areas. Their research seeks to understand the physical characteristics and processes of the ocean. AOML scientists will lead the monitoring program. The SEFSC is one of five national marine fishery science centers responsible for federal marine fishery research programs and conducts scientific research on living marine resources with the goal of rebuilding and maintaining sustainable fisheries. The monitoring program will provide a detailed assessment of the pre-, during, and post-habitat restoration conditions. The team's coastal marine sampling program will provide the first comprehensive interdisciplinary ecological and oceanographic depiction of the region. The four components of the monitoring plan are discussed below:

#### **1) Characterization of the physical conditions of the coastal and marine environment.**

AOML will conduct one-day monthly cruises to continuously collect current, temperature, salinity, and light using ship-mounted instruments. State-of-the-art satellite remote sensing technology will provide a large-scale analysis of the regional temperature, ocean color, and

turbidity which will characterize the coastal line, beaches, mangroves, seagrass, sediments, and other elements of the natural environment.

2) **Ocean chemistry and nearshore juvenile fish habitat.** AOML will conduct a field study to assess nearshore ecology, particularly for juvenile fish. Zooplankton will be collected monthly. Juvenile fish will be assessed using nets (otter trawls and seine nets) with visual surveys along the shoreline. A coastal habitat with increased mangrove and seagrass habitat will ideally support increased upper level activity on the food chain.

3) **Microbial water quality.** AOML will conduct microbial water quality monitoring and assessment and microbial source tracking. Wetland and beach areas will be assessed weekly. Coastal sampling will be conducted as part of the larger monthly shipboard water quality monitoring.

4) **Nearshore fish populations.** SEFSC will provide two monitoring elements: establishing a baseline chemical signature for microchemistry heavy metals (lead, mercury, cadmium, barium, and aluminum); and monitoring nearshore fish populations (ichthyofauna assemblages). Microchemistry of calcium carbonate ear bones in fish is a proven method for determining environmental conditions at early stage habitats of juvenile fish; they will be sampled monthly through hook and line fishing. Detailed baseline surveys will allow for pre-, post- and during restoration comparisons. Every other month, SEFSC will conduct nearshore fish surveys at four sites. Seine net samples will be analyzed for species abundance, species diversity, size and age classes, changes over time, and sampling location.

### 3. OVERALL QUALIFICATIONS

The City has developed a strong team of professionals to lead this comprehensive project. Key project personnel are detailed below (resumes for each are provided in the Attachments) :

Juan Fernandez: Mr. Fernandez has been with the Miami's Parks and Recreation Department since 1996, since which time he has restored 46 acres through the protection and conservation of more than 20 different populations of highly threatened plant species. He successfully located a small population of the Biscayne prickly-ash (*Zanthoxylum coriaceum*) on Virginia Key; a plant that was previously believed to have been extinct on this island, and now flourishes thanks to his efforts. He has planted a total of 17,624 native trees all of which were cultivated onsite at the Virginia Key nursery. He pioneered the establishment of a nature trail in the Virginia Key hammock to provide public education. As Senior Parks Naturalist, he currently directs all ecological maintenance and ecosystem restoration at five City parks, including Virginia Key. He will supervise the ecological restorations at the Virginia Key Park.

Guy Forchion: Mr. Forchion has been the Director of Operations for the Historic Virginia Key Beach Park Trust since 2003. Guided by the master plan, he is responsible for implementing the \$40 million dollar Park renovations. His distinguished career as a Congressional Aide, U.S. Census Community Partnership Specialist and Operations Management Consultant for the Florida Department of Labor qualifies him to manage and direct the project. He has worked both behind the desk and in the field on successful projects for the Park: the U.S. Army Corps of Engineers Section 1135 shoreline restoration and stabilization project. Mr. Forchion will supervise the restoration and education activities at the Virginia Key Beach Park.

Stephen Bogner: Mr. Bogner has been the City Marinas Manager since 1997 and has more than

15 years of experience in the management of wet/dry slip marinas. He currently manages operation and maintenance at the City's three municipal marinas; he also manages the City's 225-vessel mooring field. He is the liaison to the City administration, Commission, and serves on advisory boards for waterfront projects and initiatives. He will supervise the contractor services for submerged/derelect vessel and barge removal, and associated submerged debris removal.

Gary Milano: Mr. Milano is an extensively published and widely recognized expert on coastal habitat restoration and marine fishery population dynamics. He currently serves as the Coastal Habitat Restoration Coordinator for the Miami-Dade County Department of Environmental Resources Management (DERM) and in his 28 years there has successfully completed over 50 habitat restoration efforts including the restoration of over 500 acres of wetlands, 150 acres of coastal strand and dune community, and 150 acres of tropical hardwood hammock and has extensive experience particularly on Virginia Key. He brings more than 35 years of experience in natural ecosystem resources of the southeast and has agreed to partner with the City in a coordinated advisory capacity.

Elizabeth Johns, Ph.O.D.: Dr. Johns currently works as an Oceanographer in the Physical Oceanography Division of NOAA/AMOL. She is a well-published expert and continues to research the regional circulation and interdisciplinary ecological studies of south Florida, Gulf of Mexico, and Caribbean coastal waters; and the role of North Atlantic western boundary currents. Dr. Johns will lead a team of at least six additional researchers that will provide pre-, during, and post- restoration monitoring to help measure and ensure the success of the City's coastal and marine habitat restoration projects.

### **Administrative Resources and Capabilities**

Although the City's approach has strong on-the-ground habitat restoration components and program management costs are minimal, as a large-scale local municipality, the City has secured a proven network of administrative resources and capabilities that will ensure the successful management of restoration work and grant responsibilities.

The City of Miami will serve as the fiscal agent and is keenly positioned to implement and support this project. The City currently manages millions of dollars in federal, state, and local grant contracts, working with a Budget Analyst on a monthly basis to review expenditures and performance. Further, all expenses will be handled by the City's Finance Department, which was recently awarded the Certificate of Achievement for Excellence in Financial Reporting by the Government Finance Officers Association of the United States and Canada. This award is the highest form of recognition in the area of government accounting and financial reporting.

City infrastructure includes access to the City administration building, including facilities, equipment and personnel dedicated to the fiscal, legal, and operational soundness of the City. Restoration work will occur in the field, on the project site. This work will be supported by the assembled team under the direction of a Project Manager, responsible for all aspects of grant coordination and reporting. The City is well positioned to provide adequate and appropriate facilities, with a vast number of meeting spaces available throughout the City. The Parks and Recreation Department is equipped with many Park facilities, which are ADA-compliant.



In accordance with the American Recovery and Reinvestment Act, the City is prepared to provide NOAA the following information within 10 days of the end of each calendar quarter (beginning July 10, 2009):

- Total amount of funds received;
- Amount of funds expended;
- A list of activities for which funds were expended including the activity name, description, completion status, and estimate of the number of jobs created or retained;
- Identification of infrastructure investments, if applicable, including the purpose, contact person, and rationale for selecting the project; and
- Detailed information on any subcontracts including any data elements required to comply with the Federal Funding Accountability and Transparency Act of 2006.

**4. PROJECT COSTS** – Please see attached Budget and Budget Narrative

## **5. OUTREACH AND EDUCATION**

Coastal habitats that support living marine resources are matchless educational resources that must be maintained as living laboratories of life. The more that can be accomplished through habitat restoration, the more we will be able to experience the amazing benefits for this and future generations. The City will utilize its Department of Communications to issue news releases regarding important milestones and goals attained for the duration of the 18-month grant period (including the number of jobs created and maintained) and when post-restoration monitoring results have been gathered. The releases will recognize NOAA's financial contribution to the project as well as those from NOAA personnel from the Atlantic Oceanographic and Meteorological Laboratory (AOML) located on Virginia Key, the consultation services provided by Miami-Dade County and the collaborative efforts of the Historic Virginia Key Park Trust, City's Parks and Recreation Department, and Public Facilities.

The City continually seeks grant funding for its initiatives in an effort to save citizens' tax dollars. As part of the commitment to actualize the Virginia Key Master Plan, City staff will continue to make applications for grant funding that will assist in this essential habitat restoration projects. Through the Historic Virginia Key Park Trust, the City also has the capacity to seek Foundation and private monies as a way of furthering habitat restoration efforts.

The success of the project is expected to attract other agencies concerned with habitat restoration and the need for public education programs to complement the project's success. Currently, the City Park at Virginia Key has a small nature trail and companion booklet informing visitors about native plants they will discover on the trail - with future funding, this trail will be expanded to link up with the trails planned throughout the Historic Park. Boardwalks and educational signage about the importance of native vegetation and native habitat maintenance will be included in the parks presentations and educational programming. The Trust's educational programming addresses the national importance of both the Key's human history and its unspoiled natural state and is committed to continuing and improving upon these educational foci. Collaborative efforts among the City, the Trust, Miami-Dade County and other Virginia Key sites such as the NOAA Atlantic Oceanographic and Meteorological Laboratory and the University of Miami's Rosenstiel School for Marine and Atmospheric Science will continue.