
**DRAFT COMPREHENSIVE CONSERVATION PLAN
AND ENVIRONMENTAL ASSESSMENT**

Tampa Bay Refuges

**Egmont Key National Wildlife Refuge
Pinellas National Wildlife Refuge
Passage Key National Wildlife Refuge**

Hillsborough, Pinellas, and Manatee Counties, Florida

**U.S. Department of the Interior
Fish and Wildlife Service**

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SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. Background

INTRODUCTION

This Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Egmont Key, Passage Key, and Pinellas National Wildlife Refuges, also known as the Tampa Bay Refuges, was prepared to guide management actions and direction for these refuges. Fish and wildlife conservation will receive first priority in refuge management; wildlife-dependent recreation will be allowed and encouraged as long as it is compatible with, and does not detract from, the mission of the refuges or the purposes for which they were established.

A planning team developed a range of alternatives that best met the goals and objectives of the refuge and that could be implemented within the 15-year planning period. This Draft CCP/EA describes the Fish and Wildlife Service's (Service) proposed plan, as well as other alternatives considered and their effects on the environment. The Draft CCP/EA will be made available to state and federal government agencies, conservation partners, and the general public for review and comment. Comments from each entity will be considered in the development of the final CCP.

PURPOSE AND NEED FOR THE PLAN

The purpose of the Draft CCP/EA is to develop a proposed action that best achieves the purposes of each refuge; attains the vision and goals developed for each refuge; contributes to National Wildlife Refuge System (Refuge System) mission; addresses key problems, issues and relevant mandates; and is consistent with sound principles of fish and wildlife management.

Specifically, the plan is needed to:

- Provide a clear statement of refuge management direction;
- Provide refuge neighbors, visitors, and government officials with an understanding of Service management actions on and around the refuge;
- Ensure that Service management actions, including land protection and recreation/education programs, are consistent with the mandates of the Refuge System; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

FISH AND WILDLIFE SERVICE

The Service traces its roots to 1871 and the establishment of the Commission of Fisheries involved with research and fish culture. The once independent commission was renamed the Bureau of Fisheries and placed under the Department of Commerce and Labor in 1903.

The Service also traces its roots to 1886 and the establishment of a Division of Economic Ornithology and Mammalogy in the Department of Agriculture. Research on the relationship of birds and animals to agriculture shifted to delineation of the range of plants and animals so the name was changed to the Division of the Biological Survey in 1896.

The Department of Commerce, Bureau of Fisheries, was combined with the Department of Agriculture, Bureau of Biological Survey, on June 30, 1940, and transferred to the Department of the Interior as the Fish and Wildlife Service. The name was changed to the Bureau of Sport Fisheries and Wildlife in 1956 and finally to the Fish and Wildlife Service in 1974.

The Service, working with others, is responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people through Federal programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries (142 DM 1.1).

As part of its mission, the Service manages more than 540 national wildlife refuges covering over 95 million acres. These areas comprise the National Wildlife Refuge System, the world's largest collection of lands set aside specifically for fish and wildlife. The majority of these lands, 77 million acres, is in Alaska. The remaining acres are spread across the other 49 states and several United States territories. In addition to refuges, the Service manages thousands of small wetlands, national fish hatcheries, 64 fishery resource offices, and 78 ecological services field stations. The Service enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

NATIONAL WILDLIFE REFUGE SYSTEM

The mission of the National Wildlife Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997 is:

“...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) established, for the first time, a clear legislative mission of wildlife conservation for the Refuge System. Actions were initiated in 1997 to comply with the direction of this new legislation, including an effort to complete comprehensive conservation plans for all refuges. These plans, which are completed with full public involvement, help guide the future management of refuges by establishing natural resources and recreation/education programs. Consistent with the Improvement Act, approved plans will serve as the guidelines for refuge management for the next 15 years. The Improvement Act states that each refuge shall be managed to:

- Fulfill the mission of the Refuge System;
- Fulfill the individual purposes of each refuge;
- Consider the needs of wildlife first;
- Fulfill requirements of comprehensive conservation plans that are prepared for each unit of the Refuge System;
- Maintain the biological integrity, diversity, and environmental health of the Refuge System; and

-
- Recognize that wildlife-dependent recreation activities including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation are legitimate and priority public uses; and allow refuge managers authority to determine compatible public uses.

The following are just a few examples of your national network of conservation lands. Pelican Island National Wildlife Refuge, the first refuge, was established in 1903 for the protection of colonial nesting birds in Florida, such as the snowy egret and the brown pelican. Western refuges were established for American bison (1906), elk (1912), prong-horned antelope (1931), and desert bighorn sheep (1936) after over-hunting, competition with cattle, and natural disasters decimated once-abundant herds. The drought conditions of the 1930s [Dust Bowl](#) severely depleted breeding populations of ducks and geese. Refuges established during the Great Depression focused on “waterfowl production areas” (i.e., protection of prairie wetlands in America’s heartland). The emphasis on waterfowl continues today but also includes protection of wintering habitat in response to a dramatic loss of bottomland hardwoods. By 1973, the Service had begun to focus on establishing refuges for endangered species.

Approximately 38 million people visited national wildlife refuges in 2002, most to observe wildlife in their natural habitats. As the number of visitors grows, there are significant economic benefits to local communities. In 2001, 82 million people, 16 years and older, fished, hunted, or observed wildlife, generating \$108 billion. In a study completed in 2002 on 15 refuges, visitation had grown 36 percent in seven years. At the same time, the number of jobs generated in surrounding communities grew to 120 per refuge, up from 87 jobs in 1995, pouring more than \$2.2 million into local economies. The 15 refuges in the study were Chincoteague (Virginia); National Elk (Wyoming); Crab Orchard (Illinois); Eufaula (Alabama); Charles M. Russell (Montana); Umatilla (Oregon); Quivira (Kansas); Mattamuskeet (North Carolina); Upper Souris (North Dakota); San Francisco Bay (California); Laguna Atacosa (Texas); Horicon (Wisconsin); Las Vegas (Nevada); Tule Lake (California); and Tensas River (Louisiana)—the same refuges identified for the 1995 study. Other findings also validate the belief that communities near refuges benefit economically. Expenditures on food, lodging, and transportation grew to \$6.8 million per refuge, up 31 percent from \$5.2 million in 1995. For each dollar spent on the Refuge System, surrounding communities benefited with \$4.43 in recreation expenditures and \$1.42 in job-related income (Caudill and Laughland, unpubl. data).

Volunteers continue to be a major contributor to the success of the Refuge System. In 2002, volunteers contributed more than 1.5 million hours on refuges nationwide, a service valued at more than \$22 million.

The wildlife and habitat vision for national wildlife refuges stresses that wildlife comes first; that ecosystems, biodiversity, and wilderness are vital concepts in refuge management; that refuges must be healthy and growth must be strategic; and that the Refuge System serves as a model for habitat management with broad participation from others.

The Improvement Act stipulates that comprehensive conservation plans be prepared in consultation with adjoining federal, state, and private landowners and that the Service develop and implement a process to ensure an opportunity for active public involvement in the preparation and revision (every 15 years) of the plans.

All lands of the Refuge System will be managed in accordance with an approved comprehensive conservation plan that will guide management decisions and set forth strategies for achieving refuge unit purposes. The plan will be consistent with sound resource management principles, practices, and legal mandates, including Service compatibility standards and other Service policies, guidelines, and planning documents (602 FW 1.1).

LEGAL AND POLICY CONTEXT

Legal Mandates, Administrative and Policy Guidelines, and Other Special Considerations

Administration of national wildlife refuges is guided by the mission and goals of the Refuge System, congressional legislation, presidential executive orders, and international treaties. Policies for management options of refuges are further refined by administrative guidelines established by the Secretary of the Interior and by policy guidelines established by the Director of the Fish and Wildlife Service. Select legal summaries of treaties and laws relevant to administration of the Refuge System and management of the Tampa Bay Refuges are provided in Appendix C.

Treaties, laws, administrative guidelines, and policy guidelines assist the refuge manager in making decisions pertaining to soil, water, air, flora, fauna, and other natural resources; historical and cultural resources; research and recreation on refuge lands; and provide a framework for cooperation between the Tampa Bay Refuges and other partners, such as the Florida Department of Environmental Protection (FDEP) and private landowners.

Lands within the Refuge System are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. All programs and uses must be evaluated based on mandates set forth in the Improvement Act. Those mandates are to:

- Contribute to ecosystem goals, as well as refuge purposes and goals;
- Conserve, manage, and restore fish, wildlife, and plant resources and their habitats;
- Monitor the trends of fish, wildlife, and plants;
- Manage and ensure appropriate visitor uses as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and
- Ensure that visitor activities are compatible with refuge purposes.

The Improvement Act further identifies six priority wildlife-dependent recreational uses. These uses are: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. As priority public uses of the Refuge System, they receive priority consideration over other public uses in planning and management.

Biological Integrity, Diversity, and Environmental Health Policy

The Improvement Act directs the Service to ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans. The policy is an additional directive for refuge managers to follow while achieving refuge purpose(s) and the Refuge System mission. It provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. When evaluating the appropriate management direction for refuges, refuge managers will use sound professional judgment to determine their refuges' contribution to biological integrity, diversity, and environmental health at multiple landscape scales. Sound professional judgment incorporates field experience, knowledge of refuge resources, refuge role within an ecosystem, applicable laws, and best available science, including consultation with others both inside and outside the Service.

NATIONAL AND INTERNATIONAL CONSERVATION PLANS AND INITIATIVES

Multiple partnerships have been developed among government and private entities to address the environmental problems affecting regions. There is a large amount of conservation and protection information that defines the role of the refuge at the local, national, international, and ecosystem levels. Conservation initiatives include broad-scale planning and cooperation between affected parties to address declining trends of natural, physical, social, and economic environments. The conservation guidance described below, along with issues, problems, and trends, was reviewed and integrated, where appropriate, into this Draft CCP/EA.

This Draft CCP/EA supports, among others, the Partners-in-Flight Plan, the North American Waterfowl Management Plan, the Western Hemisphere Shorebird Reserve Network, and the National Wetlands Priority Conservation Plan.

North American Bird Conservation Initiative. Started in 1999, the North American Bird Conservation Initiative is a coalition of government agencies, private organizations, academic institutions, and private industry leaders in the United States, Canada, and Mexico, working to ensure the long-term health of North America's native bird populations by fostering an integrated approach to bird conservation to benefit all birds in all habitats. The four international and national bird initiatives include the North American Waterfowl Management Plan, Partners-in-Flight, Waterbird Conservation for the Americas, and the U.S. Shorebird Conservation Plan.

North American Waterfowl Management Plan. The North American Waterfowl Management Plan is an international action plan to conserve migratory birds throughout the continent. The plan's goal is to return waterfowl populations to their 1970s levels by conserving wetland and upland habitat. Canada and the United States signed the plan in 1986 in reaction to critically low numbers of waterfowl. Mexico joined in 1994, making it a truly continental effort. The plan is a partnership of federal, provincial/state and municipal governments, non-governmental organizations, private companies, and many individuals, all working towards achieving better wetland habitat for the benefit of migratory birds, other wetland-associated species and people. Plan projects are international in scope, but implemented at regional levels. These projects contribute to the protection of habitat and wildlife species across the North American landscape.

Partners-in-Flight Bird Conservation Plan. Managed as part of the Partners-in-Flight Plan, the peninsular Florida physiographic area represents a scientifically based land bird conservation planning effort that ensures long-term maintenance of healthy populations of native land birds, primarily non-game land birds. Non-game land birds have been vastly under-represented in conservation efforts, and many are exhibiting significant declines. This plan is voluntary and non-regulatory, and focuses on relatively common species in areas where conservation actions can be most effective, rather than the frequent local emphasis on rare and peripheral populations.

U.S. Shorebird Conservation Plan. The U.S. Shorebird Conservation Plan is a partnership effort throughout the United States to ensure that stable and self-sustaining populations of shorebird species are restored and protected. The plan was developed by a wide range of agencies, organizations, and shorebird experts for separate regions of the country, and identifies conservation goals, critical habitat conservation needs, key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face.

North American Waterbird Conservation Plan. This plan provides a framework for the conservation and management of 210 species of waterbirds in 29 nations. Threats to waterbird populations include destruction of inland and coastal wetlands, introduced predators and invasive

species, pollutants, mortality from fisheries and industries, disturbance, and conflicts arising from abundant species. Particularly important habitats of the southeast region include pelagic areas, marshes, forested wetlands, and barrier and sea island complexes. Fifteen species of waterbirds are federally listed, including breeding populations of wood storks, Mississippi sandhill cranes, whooping cranes, interior least terns, and Gulf coast populations of brown pelicans. A key objective of this plan is the standardization of data collection efforts to better recommend effective conservation measures.

RELATIONSHIP TO STATE WILDLIFE AGENCY

A provision of the Improvement Act, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with other state fish and game agencies and tribal governments during the course of acquiring and managing refuges. State wildlife management areas and national wildlife refuges provide the foundation for the protection of species, and contribute to the overall health and sustainment of fish and wildlife species in the State of Florida.

The Florida Fish and Wildlife Conservation Commission's (FWC) mission is "managing fish and wildlife resources for their long-term well-being and the benefit of people." The FWC manages the state's fish and wildlife resources to conserve some of the most complex and delicate ecosystems in the world, as well as a wide diversity of species. The FWC scientists work to provide the latest scientific information used to make good management decisions involving fish and wildlife populations, habitat issues, and the human dimension aspects of conservation. FWC law enforcement officers enforce rules to protect fish and wildlife, keep waterways safe for millions of boaters, and cooperate with other law enforcement agencies providing homeland security. In addition, the FWC staff communicates with a variety of audiences to encourage participation, responsible citizenship and stewardship of the state's natural resources, including hunter safety training, boating safety classes, and birding and outdoor recreation classes. The FWC territory includes 53,927 square miles of land and 5,983 square miles of water. The territory includes 5.6 million acres of wildlife management areas; 2,276 miles of tidal shoreline; about 10,550 miles of rivers, streams, and creeks; and about 7,700 lakes greater than 10 acres. In the state, there are more than 200,000 hunters, more than 3 million freshwater and saltwater anglers (residents and nonresidents), and more than 3 million wildlife watchers.

The state's participation and contribution throughout this planning process will provide for ongoing opportunities and open dialogue to improve the ecological sustainment of fish and wildlife in the State of Florida. An essential part of comprehensive conservation planning is integrating common mission objectives where appropriate.

II. Refuge Overview

INTRODUCTION

There are 28 national wildlife refuges in the State of Florida (Figure 1). The Tampa Bay Refuges are managed as part of the Chassahowitzka National Wildlife Refuge Complex (Figure 2). The Tampa Bay Refuges currently have one dedicated full-time assistant refuge manager, and are otherwise supported by nine staff members located 100 miles away at the Crystal River Refuge in Crystal River, Florida. The Tampa Bay Refuges include Egmont Key, Pinellas, and Passage Key Refuges (Figure 3).

Egmont Key NWR (Figure 4) is located at the mouth of Tampa Bay, along the Gulf coast of Florida in Hillsborough County. In 1974, the 392-acre refuge was established to protect the Key's significant natural, historical, and cultural resources from the impending threats of development. Egmont Key NWR is the only refuge island open to the public in Tampa Bay, and has been traditionally visited for many years as a primary recreation destination. The refuge is open only during daylight hours. The island receives about 130,000-170,000 visitors annually who access the island by private or tour boat (U.S. Fish and Wildlife Service Tampa Bay Refuges "Visitor Services Review Report," March 2004; and Kleen and Hunter, U.S. Fish and Wildlife Service, Biological Review Report, June 2006).

Specifically, Egmont Key NWR seeks to provide nesting habitat for brown pelicans and other waterbirds, as well as to conserve and protect barrier island habitat and preserve historical structures of national significance. Presently, the island's approximate 244 acres of beach and coastal berm supports more than 110 species of nesting, migratory, and wintering birds (see Chapter II, Biological Resources). Thousands of laughing gulls and royal terns, hundreds of brown pelicans and sandwich terns, dozens of black skimmers and least terns, and a handful of American oystercatchers nest annually. Egmont Key NWR provides valuable wildlife habitat in the very populated Tampa Bay area. The island is listed as critical habitat for endangered piping plovers and provides habitat and protection for endangered manatees and sea turtles. Approximately 20-70 endangered Atlantic loggerhead turtles nest annually. Egmont Key NWR has an unusually high population of gopher tortoises and box turtles. Two wildlife sanctuaries, one on the east side of the island and one at the south end of the island, comprise about 97 acres and are closed to all public use, year-round (Kleen and Hunter, June 2006).

Cooperative management agreements between the Service, the U.S. Coast Guard (USCG), and the FDEP entrust daily management activities of Egmont Key NWR to the Florida Park Service (FPS). The FPS plays a critical role in managing recreation on the island. Egmont Key State Park is managed to protect and restore the historic structures (i.e., historic lighthouse, guard house, gun batteries and brick roads) and for swimming, sunbathing, shelling, and picnicking. Park staff also assist the refuge in habitat and wildlife management on a regular basis. Park staff monitor sea turtle nesting, control exotic species, and care for injured birds. The USCG owns 55 acres, including the lighthouse, at the north end of the island. This property is the focus of the FSP's operation due to the concentration of historic sites (e.g., Fort Dade) on this property. In addition, the Tampa Bay Pilots Association leases 5 acres of land from Hillsborough County and two tracts, totaling 5 acres, from the Service along the east side of the island to conduct their business of piloting large ships into and out of Tampa Bay (Figure 5).

Figure 1. National wildlife refuges of Florida



Figure 2. Chassahowitzka NWR Complex



Figure 3. Tampa Bay Refuges

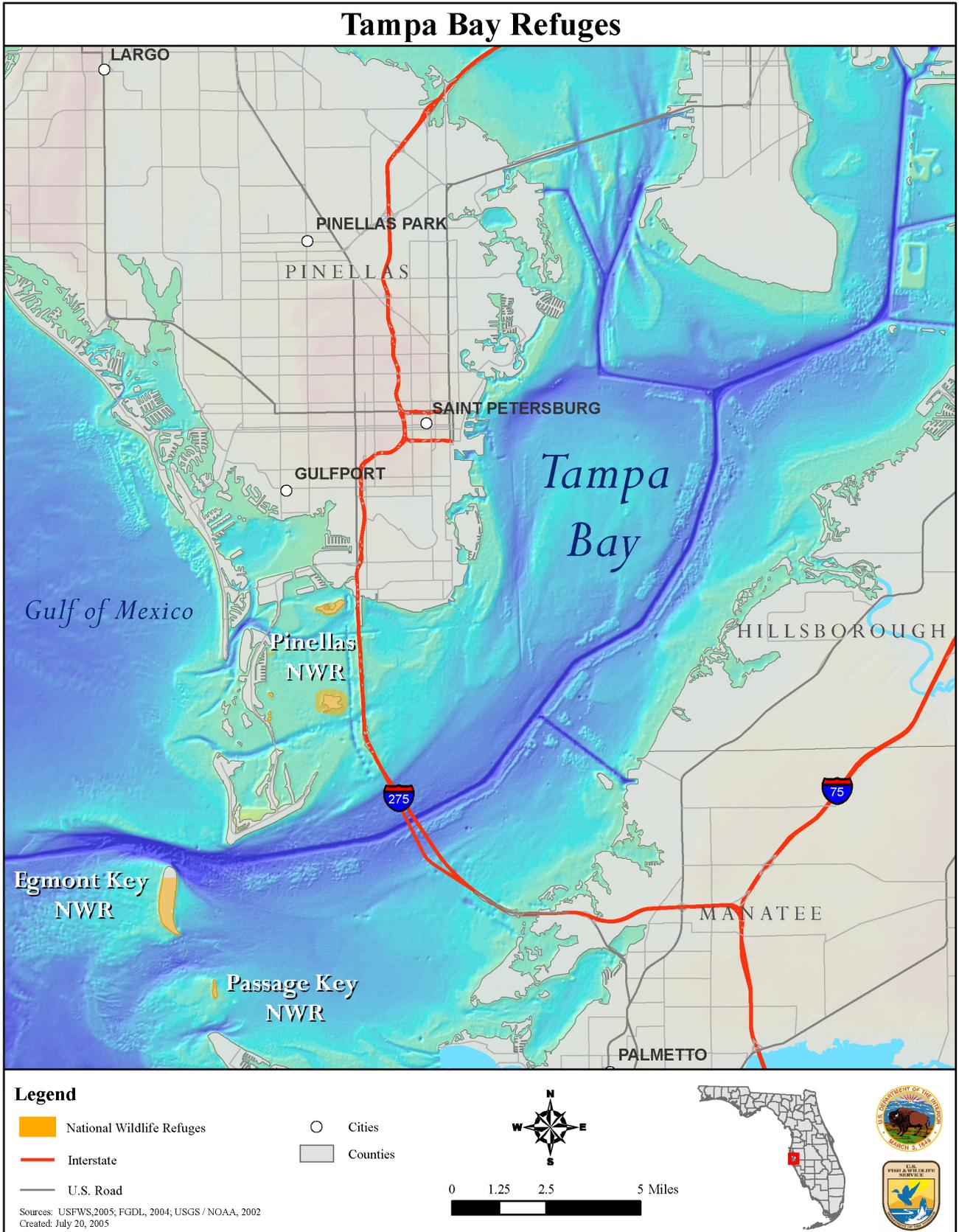
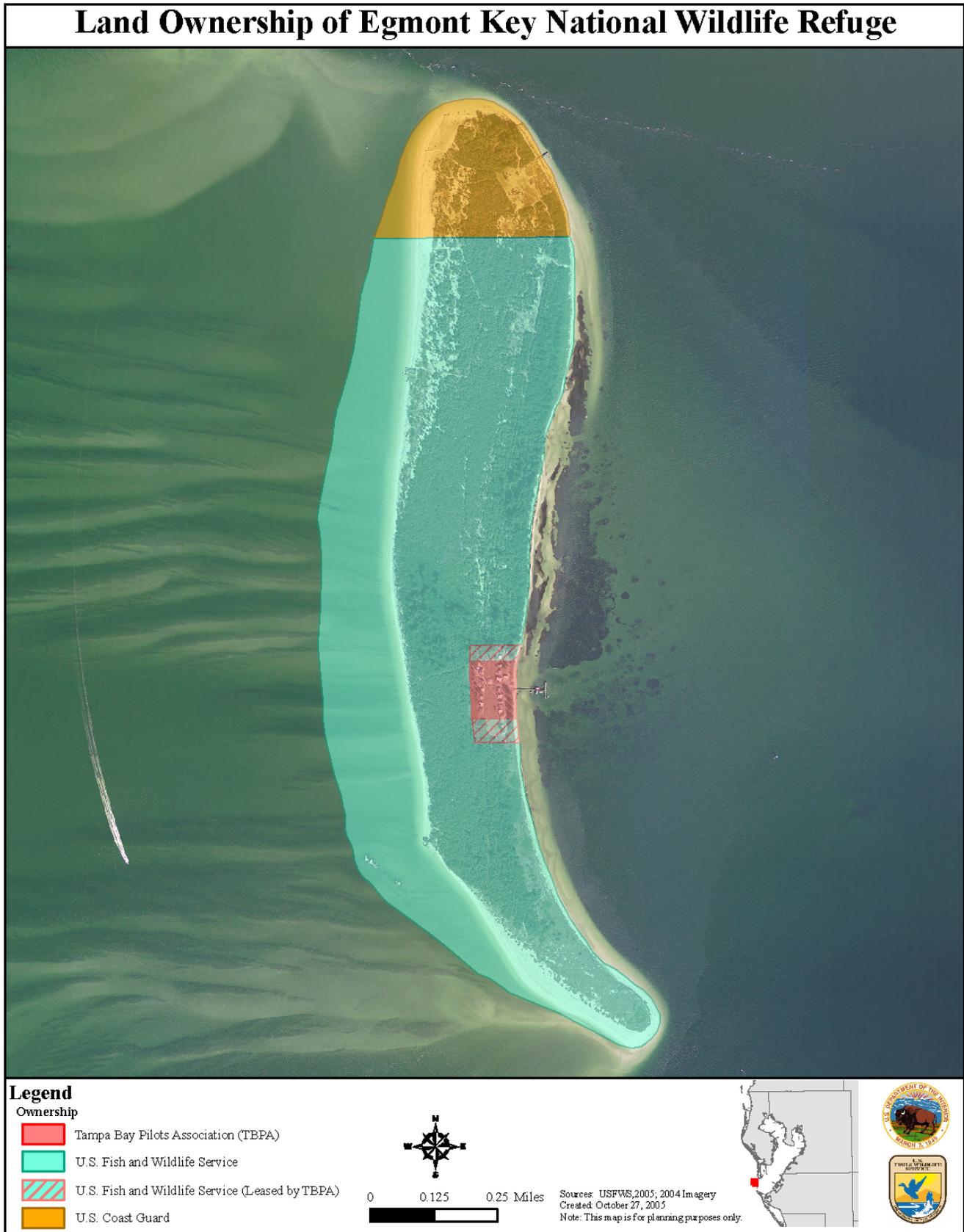


Figure 4. Egmont Key NWR



Figure 5. Land ownership of Egmont Key NWR



Pinellas NWR (Figure 6) is located at the mouth of Tampa Bay, along the Gulf coast of Florida, in Pinellas County. The refuge was established in 1951 as a breeding ground for colonial bird species. It contains seven mangrove islands encompassing about 394 acres, all within the city limits of St. Petersburg. The refuge is comprised of Little Bird, Mule, Jackass, Listen, and Whale Island Keys and leases Tarpon and Indian Keys from Pinellas County. A Pinellas County seagrass sanctuary is located around Tarpon and Indian Keys and the use of internal combustion engines within this zone is prohibited to protect seagrass beds. Hundreds of brown pelicans and double-crested cormorants and dozens of herons, egrets, and roseate spoonbills nest within Tarpon and Little Bird Keys. Pinellas Key provides important mangrove habitat for most long-legged wading species, especially for reddish egrets. The mangrove islands of Pinellas NWR are closed to all public use year-round to protect the migratory birds (Kleen and Hunter, USFWS, June 2006).

Passage Key NWR (Figure 7) is located at the entrance to Tampa Bay in Manatee County, along the Gulf coast of Florida, just north of Bradenton, Florida. When Passage Key was originally designated as a federal bird reservation by President Roosevelt in 1905, it was a 60- acre island with a freshwater lake and lush vegetation. Unfortunately, erosion and hurricanes have virtually destroyed the key. It is now a meandering sand bar, varying in size from 0.5 to 10 acres, depending on weather (USFWS, Visitor Services Review Report, March 2004). In 1970, Passage Key NWR was designated a Wilderness Area and because of its fragility and small size it is now closed to all public use (Figure 8). The refuges' objectives are to provide habitat for colonial waterbirds. Hundreds of brown pelicans, laughing gulls, black skimmers, and royal terns nested annually until the island was destroyed by a hurricane in 2005. Small numbers of herons and egrets also nested on the island. The key once hosted the largest royal tern and sandwich tern nesting colonies in the State of Florida. Passage is closed to public use year-round to protect the migratory birds that use the island.

Refuge History and Purpose

The Tampa Bay Refuges are crucial to the survival of many threatened and endangered species. For the most part, none of the priority public uses are actively promoted by the Service on the Tampa Bay Refuges. However, there are excellent opportunities for wildlife observation, wildlife photography, environmental education and interpretation, and outreach. Fishing is a primary public use off-shore, with the state and local governments providing primary enforcement oversight over the waterways (USFWS Visitor Services Review Report, March 2004).

During the Pleistocene era, the Tampa Bay Refuges were part of the mainland of Florida. At the end of the last glacial period, ~20,000 years ago, ice began to melt rapidly and the sea level rose swiftly, separating them from Florida. Egmont Key NWR is the only refuge in this group open for public visitation and is the refuge for which the most historical and cultural information exists. Little historical information exists for Pinellas NWR and Passage Key NWR.

Egmont Key NWR has a rich history. The entire key is listed on the National Register of Historic Places. Artifacts of aboriginal/Indian pottery, dating back 2,000 years, have been found on the island. But since there is no freshwater source, and because travel to the key entails crossing open water, it is likely that the Key was used only periodically by Native Americans for hunting, crabbing, and shell fishing. Spanish expeditions first sighted the key in the early 1500s. The first recorded contact with the key was in 1757 by Don Francisco Maria Celi, a Spanish explorer. Egmont Key was named in 1763, after the second Earl of Egmont, John Perceval, the first Lord of the British Admiralty, and a member of the Irish House of Commons.

Figure 6. Pinellas NWR

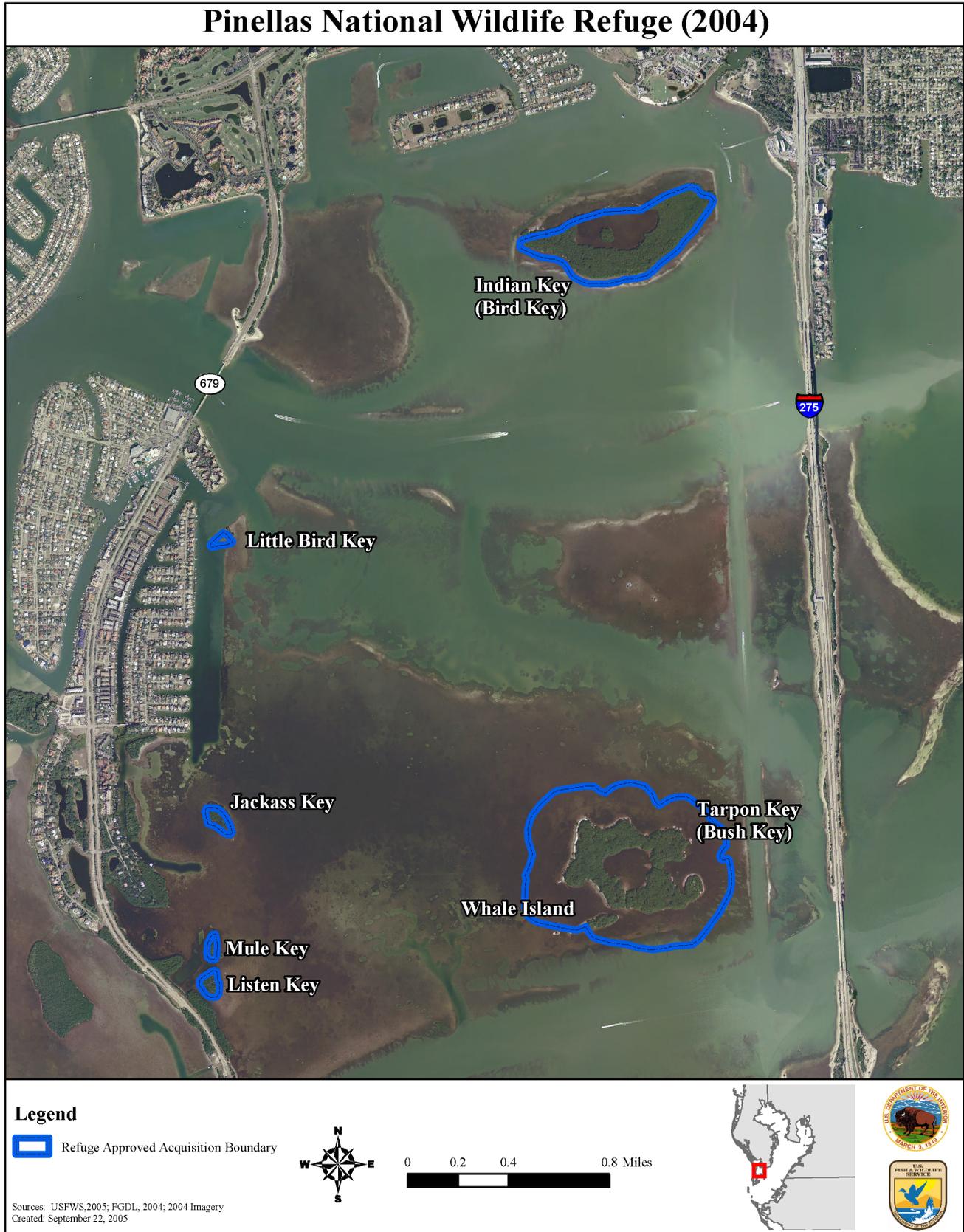
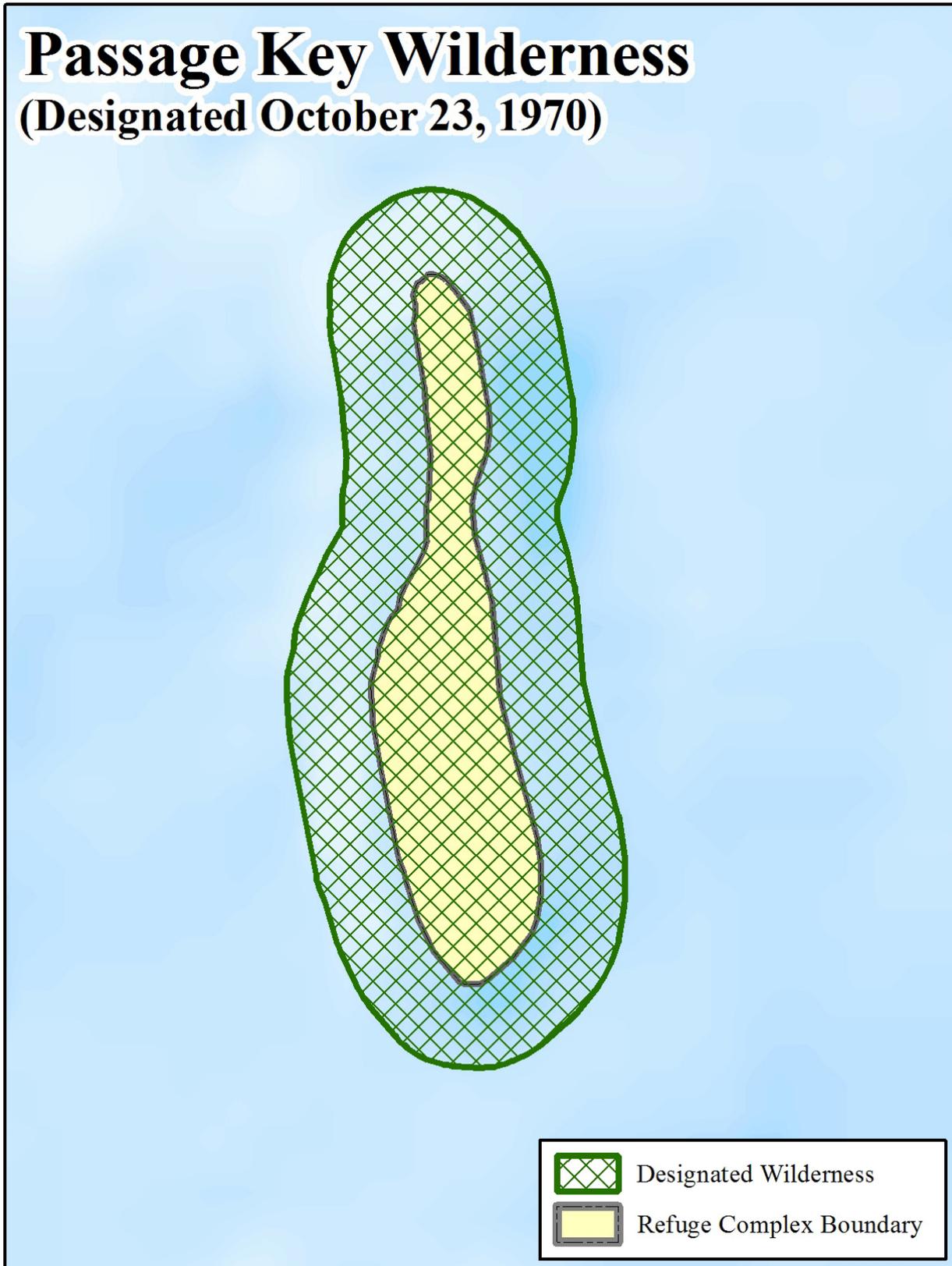


Figure 7. Passage Key NWR



Figure 8. Passage Key NWR wilderness



When mapped by the Geodetic Survey in 1875, Egmont Key was approximately 50 percent larger than it is today. The first lighthouse was built in 1848 and was the only lighthouse on the western Gulf coast of Florida. After hurricanes damaged the lighthouse in 1848 and 1852, it was moved inland and rebuilt in 1857-58, and remains in service today. In the 1850's, Egmont Key was used as a holding area for Seminole Indians as they were being transported to Arkansas and Oklahoma.

Early in the Civil War, the Key saw occupation by Confederate blockade-runners; while later in the 1860s, Union forces used Egmont Key to operate their Gulf coast blockade of the Confederacy. The Key was also used as a refuge for Union sympathizers and a military prison during the war.

Construction of Fort Dade began in 1898, with temporary gun batteries to protect Tampa at the outbreak of the Spanish/American War. The Spanish fleet never came, but by 1910 a small town of about 300 residents, brick streets, a narrow gauge railroad, an electric generating plant, and 70 buildings existed. At this time, during World War I, Fort Dade was used as a training center for National Guard Coast Artillery Units. The fort was deactivated in the early 1920s, but later reactivated and used during World War II as a harbor patrol station and an ammunition storage facility.

Egmont Key became a national wildlife refuge in 1974 and was named to the National Register of Historic Places. In 1989, the State of Florida established Egmont Key State Park through a cooperative agreement with the Service. At the present time, the USCG maintains the lighthouse and owns 55 acres at the north end of the island. The lighthouse is believed to be the oldest structure still used for its original purpose in the Tampa Bay area. The historic ruins of Fort Dade and Egmont Key State Park are managed by the Florida State Parks (FSP) in cooperation with the Service. Also, the Tampa Bay Pilots Association leases a 10-acre tract of land, 5 acres from Hillsborough County, and 5 acres in two additional tracts from the Service along the east side of the island, to conduct its business of piloting large ships in and out of Tampa Bay (Figure 9).

Egmont Key NWR, established in 1974, is administered in accordance with the National Wildlife Refuge System Administration Act of 1966, which was amended by the Improvement Act. The refuge has four basic purposes:

1. provide nesting, feeding, and resting habitat for brown pelicans, terns, and other colonial nesting waterbirds;
2. conserve and protect barrier island habitat and preserve historical structures of national significance;
3. provide habitat and protection for endangered species such as manatees and sea turtles; and
4. provide wildlife-dependent recreation and environmental education for the public (USFWS Visitor Services Review Report, March 2004).

Pinellas NWR was established in 1951 for use as an inviolate sanctuary and for migratory birds. It is closed to the public. Pinellas NWR includes Tarpon, Whale, Indian, Little Bird, Mule, Jackass, and Listen Keys. The larger islands in this group are surrounded by extensive seagrass flats and as a result no internal combustion engines are allowed within a signed boundary to protect these areas. The refuge has two basic purposes:

1. provide nesting, feeding, and resting habitat for brown pelicans and other waterbirds; and
2. conserve and protect barrier island habitat (Kleen and Hunter, USFWS, June 2006).

Figure 9. Existing facilities of Egmont Key NWR



Passage Key NWR was established under executive order (President Theodore Roosevelt) in 1905 as a preserve and breeding ground for native birds. Congress designated Passage Key NWR as a Wilderness Area in 1970 (36 acres). Passage Key NWR is closed to the public. A hurricane swept through this area in 1921, transforming this mangrove island containing a freshwater lake, into a meandering sandbar. Passage Key NWR stands at the mouth of Tampa Bay, where it faces the full force of storms off the Gulf of Mexico, and now ranges in size from 0.5-10 acres. The refuge is an intermittent island that is very important to birds. When the land is exposed, the birds populate the area. The refuge has two basic purposes:

1. provide nesting, feeding, and resting habitat for colonial waterbirds, including laughing gulls, royal terns, black skimmers, sandwich terns, brown pelicans and oystercatchers; and
2. provide critical habitat and protection for thousands of shorebirds and waterbirds (Kleen and Hunter, USFWS, June 2006).

SPECIAL DESIGNATIONS

Special designations in the Tampa Bay region are depicted in Figure 10.

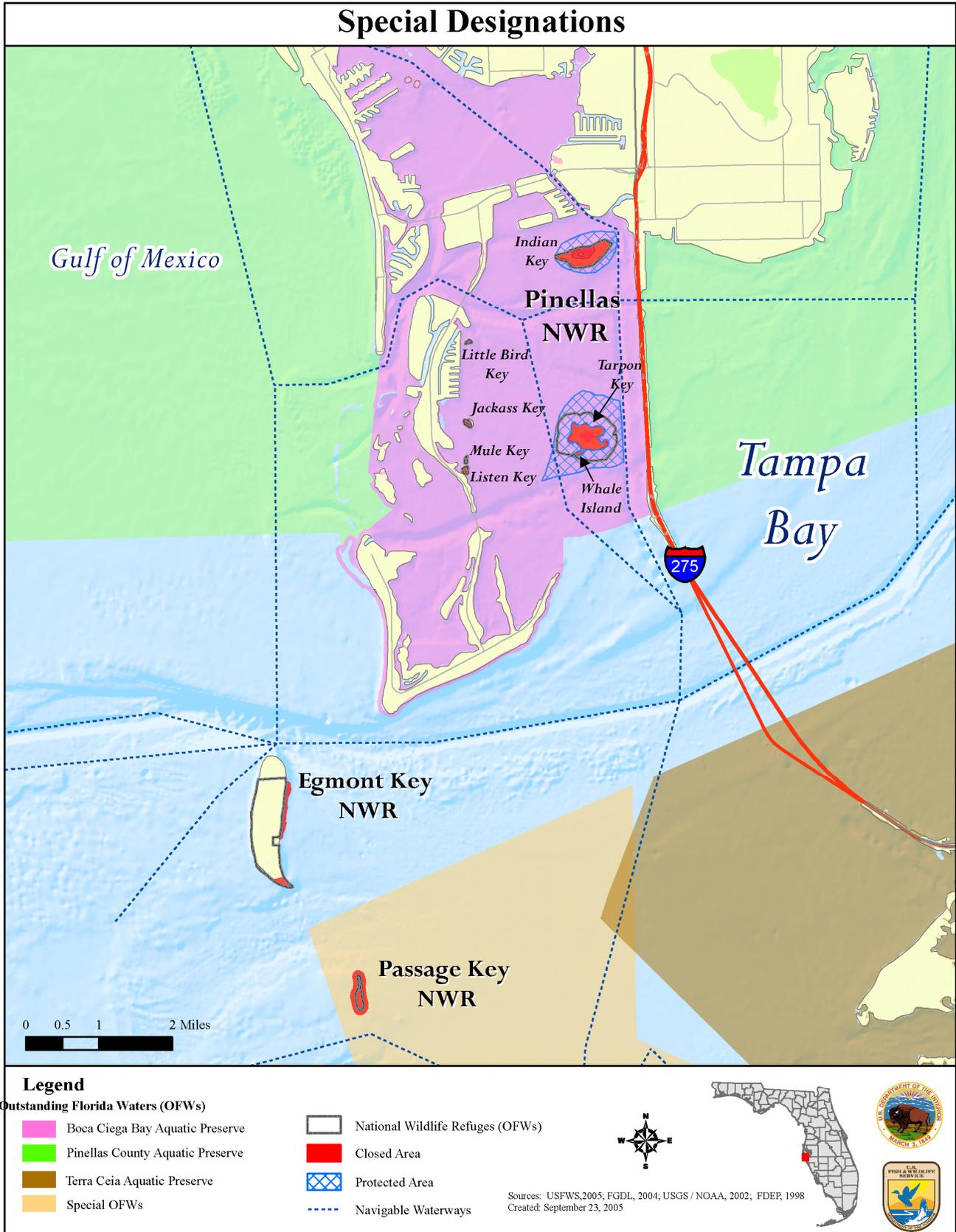
Egmont Key NWR has two principal features. The first is an extensive series of military structures and ruins, and a still-operating lighthouse. The second is the island itself, relatively remote, yet accessible, with its beaches and island vegetation. Because of its colorful military past, Egmont Key NWR was listed on the National Register of Historic Places in 1979. The Egmont Key lighthouse has also been designated a Hillsborough County Landmark. Egmont Key NWR and State Park are cooperatively managed with FSP. The bird sanctuary area at the southern end of Egmont Key NWR is closed to all public use, year-round, and a vessel exclusion zone has been established around the seagrass beds on the east side of the island to protect them from propeller damage. Egmont Key NWR is an Index Nesting Beach Site for the Atlantic loggerhead sea turtle in the State of Florida. Egmont Key NWR is also designated as critical habitat for piping plovers.

All of the islands of Pinellas NWR are closed to the public to protect the habitat and wildlife. Pinellas County has established seagrass sanctuaries around Tarpon and Indian Keys. These areas are posted to prevent boats with internal combustion engines from entering the seagrass beds. Because of Tarpon Key's unique shape, topography, and vegetative status as a mangrove island, it is a significant nesting, resting, and feeding area for a variety of marsh birds and waterbirds. Boca Ciega Bay Aquatic Preserve, in which Pinellas NWR is located, is designated as an Outstanding Florida Water (OFW).

The OFW's designation is given to waters that are "worthy of special protection due to their natural attributes" (Section 403.061, Florida Statutes); these waters are listed in Section 62-302.700, Florida Administrative Code. All permanent water bodies within state parks have been designated as OFW. The OFW designation affords the highest protection possible under state water quality rules by prohibiting degradation of water quality from the conditions existing at the time of designation. Outstanding Florida Waters in the Tampa Bay area are:

- Hillsborough River State Park, Hillsborough Bay segment;
- Cockroach Bay Aquatic Preserve, Coastal Middle Tampa Bay Basins segment;
- Little Manatee River, Middle Tampa Bay segment;
- Terra Ceia State Aquatic Preserve, Coastal Lower Tampa Bay Basins segment;
- Boca Ciega State Aquatic Preserve, Lower Tampa Bay segment;
- Pinellas County Aquatic Preserve, Lower Tampa Bay segment; and,
- Lake Manatee State Recreation Area, Manatee River segment (Florida Department of Environmental Protection, "Basin Status Report," November 2001).

Figure 10. Special designations



Other significant land and water resources in the vicinity of the Tampa Bay Refuge's include:

- DeSoto National Memorial and Mullet Key (named the number one beach in the continental U.S.) (The Tampa Bay Estuary Program, "Charting the Course for Tampa Bay," May 2006);
- Little Manatee River State Recreation Area;
- National Society's Washburn Sanctuary (Bird Key) in Terra Ciega Bay;
- Ybor City State Memorial; and
- Weedon Island County Preserve.

With the exception of the Passage Key NWR Wilderness area, other lands within the Tampa Bay Refuges were reviewed for their suitability in meeting the criteria for wilderness areas, as defined by the Wilderness Act of 1964. No other areas in the refuges were found to meet these criteria. (See Appendix H.) Therefore, the suitability of other lands within the Tampa Bay Refuges for wilderness designation is not further analyzed in this Draft CCP/EA.

Congress designated Passage Key NWR a Wilderness Area in 1970 (36 acres). Passage Key NWR is closed to visitation to protect wildlife and other natural, cultural, and/or other resources consistent with the conservation purpose(s) of the refuge. In 1992, a year-round, 100-yard buffer zone was established around the perimeter of Passage Key NWR to protect nesting terns and gulls. Wilderness designation provides an additional level of protection for this refuge, but does not open the area to public access or use.

ECOSYSTEM CONTEXT

An ecosystem is a geographical area that includes and interconnects all the living (biotic) organisms, their physical (abiotic) surroundings, and the natural cycles that sustain them. The Outer Coastal Plain Ecological Province (Bailey 1978) encompasses a large portion of the southeastern, coastal United States. The Outer Coastal Plain Ecological Province is an area of gentle slopes with abundant water resources. Estuaries, swamps, marshes, rivers, and lakes are abundant and provide habitat for a wide variety of plant and animal life. The Tampa Bay Refuges are located in the southern part of the Outer Coastal Plain Ecological Province, in an area designated as the North Florida-Peninsular Florida ecosystem unit (Figure 11). The North Florida Ecosystem includes several important areas with protective designations, including Ocala National Forest and Okefenokee and Merritt Island NWRs. In total, thirteen national wildlife refuges and one national fish hatchery exist in the North Florida Ecosystem. Various other local, state, and federal conservation areas are also located within the North Florida Ecosystem. Conservation areas in the Tampa Bay region are identified in Figure 12. The North Florida Ecosystem spans temperate and subtropical climates, numerous physiographic districts, and a wide variety of habitats. Barrier islands, xeric scrub, pine flatwoods, freshwater marshes, lakes, streams, springs, mixed hardwood/pine forests, cypress swamps and domes, dry prairies, maritime forests, hardwood hammocks, estuarine marshes, pine rocklands, sandhill woodlands, coastal strands, sawgrass prairies, sloughs, and tree islands of the North Florida Ecosystem serve a variety of native wildlife, including over 100 federally listed species, as well as interjurisdictional fishes, neotropical migratory birds, non-game waterbirds, and waterfowl.

Specifically, the Tampa Bay Refuges are located along the Gulf coast in the Southwestern Florida Flatwoods Sub-ecoregion of the Southern Coastal Plain Ecoregion. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources (U.S. Environmental Protection Agency, http://www.epa.gov/wed/pages/ecoregions/level_iii.htm). The Southern Coastal Plain consists of mostly flat plains, but it is a heterogeneous region containing barrier islands, coastal lagoons, marshes, and swampy lowlands along the Gulf and Atlantic coasts. Tampa Bay is the most prominent geographic feature in the region. In central Florida, an area of

Figure 11. U.S. Fish and Wildlife Service Ecoregions – Southeast Region

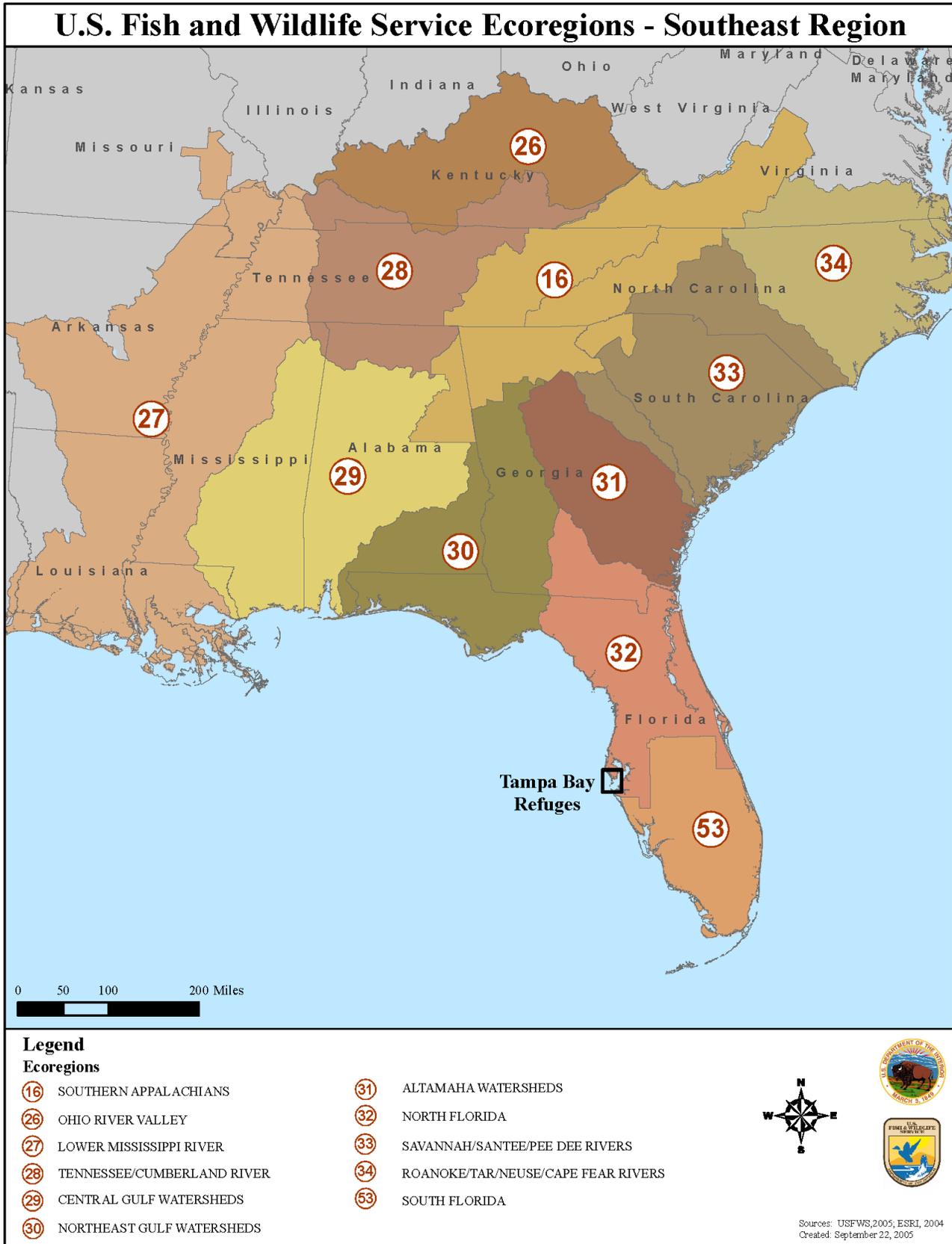


Figure 12. Conservation areas in the Tampa Bay Region



discontinuous highlands contains numerous lakes. The ecoregion is low in elevation (less than 100' MSL) with little relief. Its textured soils are wet, coarse, and sandy. The climate is subtropical with a long growing season. Average annual temperatures are about 74° F and average annual rainfall is about 50 inches; supporting a diverse range of flora and fauna. The ecoregion was once covered by a variety of forest communities that included trees of longleaf pine, slash pine, pond pine, beech, sweetgum, southern magnolia, white oak, and laurel oak. Population growth has been rapid in the last 35 years, and much of the region has been urbanized. Land cover is now mostly slash and loblolly pine with oak-gum-cypress forest in some low-lying areas, citrus groves, pasture for beef cattle, and urban areas (U.S. Environmental Protection Agency, "Level III Ecoregions of Florida—revised April 2000;" Native Seed Network, <http://www.nativeseednetwork.org/ecodetail?region=75>). Present land use in the Tampa Bay basin is characterized as: 28 percent agricultural and rangelands; 19 percent developed and urban; 18 percent upland forests; 10 percent wetlands; 8 percent shrub and brush; and 17 percent open water. Table 1 lists types of natural communities in the Tampa Bay Basin, and Table 2 lists unique or rare natural communities in the Tampa Bay Basin (Florida Department of Environmental Protection, "Basin Status Report," November 2001).

Tampa Bay's wetlands, mangroves and shoreline areas are important ecological resources and support the state's largest and most diverse colonies of wading and shorebirds and one of the most productive bird nesting habitats in the United States. Three classes of emergent tidal wetlands are generally recognized in the Tampa Bay area: mangrove forests, salt marshes, and salt barrens. The emergent tidal wetlands collectively provide critical habitat for much of the bay's wildlife. Marsh grasses and mangrove trees provide critical feeding, nesting, and sheltering habitat for a variety of birds, such as pelicans, cormorants, herons, ibises, spoonbills, and egrets. The areas provide important attachment sites for algae and invertebrate communities and provide submerged habitat for hundreds of recreationally and commercially important species of fish, crabs, shrimp, and other shellfish, such as the pink shrimp, tarpon, snook, menhaden, mullet, blue crab, and red drum. Sizable populations of bottlenosed dolphins also inhabit the bay, while the shallow seagrass flats provide an important fish nursery and feeding ground for the endangered Florida manatee (Imperial, August 2000).

Interior parts of Egmont Key NWR are undeveloped and covered with palmetto, shrub, and natural vegetation. The interior ecological system of Egmont Key NWR is described as a Palustrine system with forest and shrub/scrub consisting of broad-leaved evergreens. The shoreline is an intertidal estuarine system with shrub/scrub consisting of needle-leaved evergreens near a sandy shore.

REGIONAL CONSERVATION PLANS AND INITIATIVES

The National Estuary Program, established as part of the 1987 amendments to the Clean Water Act (CWA), seeks to protect and restore 28 designated estuaries of national significance that are deemed to be threatened by pollution, development, or overuse. The Tampa Bay Estuary Program is one of the seven estuary programs in the Gulf of Mexico. Several federal agencies participate in the planning and assessment efforts: EPA, NOAA, USGS, DOI, and USDA (U.S. EPA, <http://www.epa.gov/owow/oceans/nepccr/>, June 2007; U.S. EPA, <http://www.epa.gov/owow/oceans/nccr/2005/>, December 2004).

Table 1. Types of natural communities in the Tampa Bay Basin

Land-Cover Category	Community Type	Area in Acres	Percentage of Total Area	Characteristics
Uplands				
1	Coastal strand	12	0.001	Occurs on well-drained sandy coastlines and includes typically zoned vegetation of upper beach, nearby dunes, or coastal rock formations.
2	Dry prairie	74,353	4.55	Large treeless grasslands and shrublands on very flat terrain, interspersed with scattered cypress domes, cypress strands, isolated freshwater marshes, and hammocks.
3	Pinelands	67,393	4.12	Includes north and south Florida pine flatwoods, south Florida pine rocklands, scrubby flatwoods, and commercial pine plantations. Cypress domes, bayheads, titi swamps, and freshwater marshes are commonly interspersed in isolated depressions.
4	Sand pine scrub	4,735	0.29	Xeric plant community dominated by overstory of sand pine. Occurs in well-drained sands deposited along former shorelines and islands of ancient seas.
5	Sandhill	2,949	0.18	Xeric plant community dominated by overstory of scattered longleaf pine, along with understory of turkey oak and bluejack oak. Occurs in areas of rolling terrain on deep, well-drained sands.
6	Xeric oak scrub	9,165	0.56	Hardwood community consisting of clumps of low-growing oaks interspersed with white sand. Occurs in areas of deep, well-washed sterile sand.
7	Mixed hardwood pine	42,152	2.58	Southern extension of the Piedmont southern mixed hardwoods, occurring mainly on clay soils of the northern Panhandle. Also includes upland forests in which a mixture of conifers and hardwoods dominate overstory.
8	Hardwood hammock	101,179	6.19	Includes major upland hardwood associations that occur statewide on fairly rich sandy soils.
9	Tropical hammock	N/A	N/A	Cold-intolerant hardwood community with very high plant diversity that occurs on coastal uplands in extreme south Florida. It is characterized by tropical trees and shrubs at the northern edge of their range, which extends into the Caribbean.

Wetlands				
10	Coastal salt marsh	7,028	0.43	Herbaceous and shrubby wetland communities that include cordgrass, needlerush, and transitional or high salt marshes, occurring statewide in brackish waters along protected low energy estuarine shorelines.
11	Freshwater marsh	46,123	2.82	Wetland communities dominated by wide assortment of herbaceous plant species growing on sand, clay, marl, and organic soils in areas where water depths and inundation regimes vary.
12	Cypress swamp	37,466	2.29	Regularly inundated communities that form forested buffer along large rivers, creeks, and lakes, or occur in depressions as circular domes or linear strands. Strongly dominated by bald cypress or pond cypress.
13	Hardwood swamp	59,510	3.64	Association of wetland-adapted trees, composed either of pure stands of hardwoods or a hardwood-cypress mixture that occurs on organic soils and forms the forested floodplain of nonalluvial rivers, creeks, and broad lake basins.
14	Bay swamp	N/A	N/A	Type of hardwood swamp often found in shallow depressions in pinelands or at base of sandy ridges where seepage maintains constantly wet soils. Broadleaf evergreen trees, such as sweetbay, swamp bay, and loblolly bay, dominate overstory.
15	Shrub swamp	3,677	0.23	Dominated by low-growing, woody shrubs or small trees, usually found in wetlands changed by natural or human processes, such as altered hydroperiod, fire, clear-cutting or land clearing, and siltation.
16	Mangrove swamp	9,142	0.56	Dense, brackish water swamps, usually dominated by red, black, and white mangroves that occur along low-energy shorelines and in protected, tidally influenced bays of southern Florida. Comprises freeze-intolerant tree species that are distributed south of a line from Cedar Key on the Gulf coast to St. Augustine on the Atlantic coast.
17	Bottomland hardwood	N/A	N/A	Wetland-adapted forests composed of pure stands of hardwoods or a mixture of hardwoods and cypress. They occur throughout the state on organic soils and form the forested floodplains of nonalluvial rivers, creeks, and broad lake basins. Tree species include a mixed overstory containing black gum, water tupelo, bald cypress, blue beech, and swamp ash.

Open Water				
18	Water	273,380	16.73	Open water areas of inland lakes, ponds, rivers, and streams and brackish and saline waters of estuaries, bays, and tidal
Disturbed				
19	Grassland and agricultural lands	447,511	27.38	Upland communities with very low-growing grasses and forbs. Intensively managed sites such as improved pastures, lawns, golf courses, road shoulders, cemeteries, or weedy fallow agricultural fields.
20	Shrub and brush	133,213	8.15	Includes different situations where natural upland communities have recently been disturbed and are recovering through natural succession.
21	Exotic plant communities	N/A	N/A	Upland and wetland areas dominated by invasive non-native species that outgrow and outcompete native plant communities.
22	Barren land	315,381	19.30	Developed areas such as roads, parking lots, and buildings.

N/A—This community type is not present in the basin.

Source: Natural community definitions are adapted from Kautz, Randy, D. T. Gilbert, and G. M. Mauldin. 1993. "Vegetative Cover in Florida Based on 1985-1989 Landsat Thematic Mapper Imagery." *Florida Scientist* 56(3):135-154.

The Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA), provides national leadership, strategic direction, and guidance to state and territory coastal programs and estuarine research reserves. It oversees six major programs. Each program has a national reach, but is designed to account for local resources and needs. The office works with state and territory coastal resource managers to develop a scientifically based, comprehensive national system of marine protected areas and supports effective management and sound science to protect, sustain, and restore coral reef ecosystems. These activities are mandated by the Coastal Zone Management Act, the Marine Protected Areas Executive Order, and the Coral Reef Conservation Act (National Oceanic and Atmospheric Administration, <http://coastalmanagement.noaa.gov/>).

The U.S. Geological Survey (USGS) National Coastal Program Plan describes a comprehensive national coastal program that responds to critical regional needs while addressing national issues associated with coastal change, including nutrient enrichment, oxygen depletion, harmful algal blooms, chemical contamination, diseases in marine organisms, and fish kills; shoreline erosion; the increasing susceptibility of coastal communities to natural hazards and sea level rise; increasing demands on non-living resources (including groundwater, sand and gravel, and energy resources); declines in living marine resources; habitat loss; loss of biodiversity; and invasions of non-indigenous species (U.S. Geological Survey, <http://marine.usgs.gov/coastal-plan/index.html>).

Table 2. Unique or rare natural communities in the Tampa Bay Basin

Natural Community Type	FNAI Global Rank	FNAI State Rank
Beach dune	G4	S2
Bird rookery	N/A	N/A
Coastal dune lake	G2	S1
Estuarine composite substrate	G3	S3
Estuarine consolidated substrate	G3	S3
Estuarine grass bed	G2	S2
Estuarine tidal marsh	G4	S4
Estuarine tidal swamp	G3	S3
Estuarine unconsolidated substrate	G5	S5
Geological feature	N/A	N/A
Manatee aggregation site	N/A	N/A
Marine grass bed	G2	S2
Marine mollusk reef	G3	S3
Marine tidal swamp	G3	S3
Maritime hammock	G4	S2
Scrub	G2	S2
Xeric hammock	G3	S3

N/A = Not available.

Note: The Florida Natural Areas Inventory Global Rank characterizes an element's relative rarity or endangerment worldwide, with G1 being critically imperiled globally because of extreme rarity or because of extreme vulnerability to extinction, and G5 being demonstrably secure globally. Likewise, the State Rank of S1 through S5 characterizes an element's relative rarity or endangerment in Florida. The rankings are based on many factors, the most important being the estimated number of element occurrences, estimated abundance (or area for natural communities), range, estimated adequately protected occurrences, relative threat of destruction, and ecological fragility.

Source: Marois, Katherine C. June 1999. *Tracking List of Rare, Threatened, and Endangered Plants and Animals and Natural Communities of Florida*. Tallahassee, Florida: Florida Natural Areas Inventory.

The Tampa Bay National Estuary Program, now simply called the Tampa Bay Estuary Program (TBEP), was established in 1991 as a partnership of Hillsborough, Manatee, and Pinellas Counties; the cities of Tampa, St. Petersburg, and Clearwater; the Southwest Florida Water Management District; the FDEP; the U.S. EPA, and the USGS. *Charting the Course*, A Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay, seeks to restore and protect water quality and bay habitats as the foundation for healthy and diverse populations of fish and wildlife. The CCMP details progress made in restoring and protecting Tampa Bay and advances strategies for continuing improvements in the future. *Charting the Course* was first released in 1996, and updated in 2006 (Tampa Bay Estuary Program, May 2006). The CCMP defined a new direction for Tampa Bay resource management, recognizing that environmental management must be an evolving/adaptive process that shifts away from emphasis on piecemeal oversight and toward a holistic view that assesses cumulative impacts of human action on entire natural systems (i.e., ecosystem management). Many collaborative activities (Table 3) have been initiated as a result of this multi-agency task force. Many research and study reports for the TBEP are available at <http://gulfsi.usgs.gov/tampabay/reports/index.html>.

One important component and outgrowth of the TBEP is the USGS's *Gulf of Mexico Integrated Science - Tampa Bay Study*. This study responds to the need to use an integrated science approach for studying the interrelations between geological, biological, chemical, and hydrological components of estuarine systems, and the impact of natural and anthropogenic change to all components of estuarine systems. The USGS's geological, biological, and water resources, and national mapping disciplines are working together with other federal, state, and local partners to develop and implement an integrated, multidisciplinary science strategy for estuarine research. Results from this research will enable scientists and resource managers to better assess the fate of our estuaries in the future. The integrated science strategy developed through this project will be used as a model for USGS-integrated science in other Gulf of Mexico estuaries.

The Southwest Florida Water Management District has developed the Comprehensive Watershed Management (CWM) program to conduct water resource assessment and planning on a watershed basis. The CWM was designed to allow for careful evaluation of the regional status of water resources, with emphasis on the Districts' Areas of Responsibility: Water Supply, Flood Protection, Water Quality, and Natural Systems. Multi-disciplinary and multi-agency teams were convened to develop and implement watershed management activities within each of the District's watersheds. Of particular importance is the Tampa Bay/Anclote River CWM Plan.

The "*American Oystercatcher Conservation Plan for the Atlantic and Gulf Coasts of the United States*" (Shulte and Brown, April 2006) focuses on (*H. p. palliatus*) in the United States, referred to as "American Oystercatcher" or simply as "oystercatchers." The present plan addresses only the populations on the East and Gulf coasts and summarizes current knowledge of their life history, distribution, and population trends, describes current threats, lists research and management needs, and outlines recommended conservation actions. Conservation activities recommended to address these threats include: identification and protection of existing habitat; creation of new habitat through carefully designed use of dredge-spoil materials; management of existing protected areas to reduce predation and disturbance; and control of predator populations, especially in the nesting season.

"*Florida's Endangered and Threatened Species Management and Conservation Plan*" (Florida Fish and Wildlife Conservation Commission, 2004), as required under Section 5 of the Florida Endangered and Threatened Species Act of 1977 [s.372.072, Florida Statutes] is a plan for management and conservation of endangered and threatened species.

Future of the Region: A Strategic Regional Policy Plan for the Tampa Bay Region (FRSRPP) (Tampa Bay Regional Planning Council, September 2005) was prepared pursuant to Chapter 186, Florida Statutes, and Chapter 27E-5, Florida Administrative Code. The FRSRPP is a long-range guide for physical, economic, and social development of the region, which identifies regional goals and policies. The purpose of the plan is the identification of objectives and/or issues of most importance to the Tampa Bay Region and which have the greatest impact on the formulation of a regional vision. The following goals serve as the foundation for the Strategic Regional Policy Plan: Affordable Housing, Economic Development, Emergency Preparedness, Natural Resources, and Regional Transportation.

Atlantic loggerhead sea turtle recovery plan – Egmont Key NWR serves as a loggerhead sea turtle nesting index beach necessary to determine population status and trends along the Atlantic (and Gulf) coast of the United States to determine progress towards the recovery (Kleen and Hunter, USFWS, June 2006).

North American Waterbird Conservation Plan (NAWCP) – The draft Southeastern United States Waterbird Conservation Plan stresses protection of nesting and foraging habitats for both colonial and non-colonial waterbirds. Egmont Key and Passage Key NWRs are important for supporting large colonies of beach-nesting species (brown pelican; sandwich, royal, and least terns; black skimmers; and laughing gulls). Pinellas Key NWR provides important mangrove habitat for most long-legged wading species, especially for reddish egrets. Tampa Bay represents the northern most “large” nesting population of reddish egrets on the Gulf Coast of Florida (Kleen and Hunter, USFWS, June 2006).

Contributions to Partners in Flight (PIF) - PIF formed Bird Conservation Plans by Bird Conservation Regions that set conservation priorities and habitat and population objectives. Habitats found on primarily Egmont Key and Pinellas NWRs include: upland forest and scrub, primarily important for transient Nearctic-neotropical migratory landbirds crossing the Gulf of Mexico; mangrove woodlands, primarily Pinellas NWR: northernmost stable populations of mangrove cuckoo, black-whiskered vireo, and Florida prairie warbler along Gulf Coast of Florida (Kleen and Hunter, USFWS, June 2006).

The U.S. Shorebird Conservation Plan (USSCP) is a partnership effort being undertaken throughout the country to ensure that shorebird populations are restored and protected. Primary objectives of this plan are: develop scientifically sound monitoring system to provide practical information to researchers and land managers; identify principles upon which management plans can integrate shorebird habitat conservation with multiple species strategies; and design a strategy for increasing public awareness and information concerning wetlands and shorebirds. Tampa Bay Refuge's are included in the Southeastern Coastal Plain-Caribbean Regional Shorebird Conservation Plan. Priorities in this regional plan focus on providing adequate nesting, foraging, and roosting habitat, especially for beach nesting and inlet foraging species. Beach and sandflat habitats on Egmont Key and Passage Key NWRs provide important nesting habitat for the American oystercatcher and foraging and roosting habitat for many species of shorebirds (including occasional non-breeding snowy plover and Wilson's plover, and winter habitat for the occasional piping plover) (Kleen and Hunter, USFWS, June 2006).

The North American Bird Conservation Initiative (NABCI) is a broad coalition of governmental, non-governmental, and academic organizations interested in coordinating efforts to conserve bird populations and the landscapes upon which they depend. NABCI evolved in 1998 out of a recognition among conservationists of the value of coordinating and integrating planning, implementation, and evaluation efforts of NAWCP, PIF, and USSCP (Kleen and Hunter, USFWS, June 2006).

The Tampa Bay Estuary Atlas, maintained by the University of South Florida, is designed to provide citizens, scientists, professionals, and planners with comprehensive and current water quality, hydrologic, and ecological data, as well as information about recreational opportunities and a library of scientific and educational materials on water resource issues. The Atlas is a "one-stop information shop" for concerned citizens and scientists alike. The Atlas functions as a warehouse for a variety of water resources information, including documents and educational links. The Atlas is a tool to help in maintaining and improving Tampa Bay's vital water resources. There exists enormous interest and wide-public support for conservation and protection of Tampa Bay's natural resources as evidenced by the many local initiatives and programs. Just a few of the many projects and restoration efforts in the Tampa Bay region are:

- [Agency on Bay Management](#) - Tampa Bay Regional Planning Council
- [Florida Forever Program](#) - Florida Department of Environmental Protection
- [Florida Natural Areas Inventory](#) - Florida State University conducts a variety of conservation planning and analysis projects.
- [Florida's Springs: Strategies for Protection and Restoration](#) - An educational document provided by the Florida Springs Task Force
- [Gulf of Mexico Integrated Science - Tampa Bay Study Overview](#), and [Five-Year Science Plan for the Tampa Bay Study](#), USGS
- [Inshore Marine Monitoring and Assessment Program](#) - An EPA-funded initiative to assess the coastal marine water of Florida.
- [Ocean and Coastal Resource Management](#) - NOAA
- [Restore America's Estuaries](#) - A national non-profit organization dedicated to preserving the nation's network of estuaries.
- [Southwest Florida Conservation Corridor: Tampa Bay Watershed Section](#) - The Agency on Bay Management, the Natural Resources Committee of the Tampa Bay Regional Planning Council.
- [Tampa Bay Oil Spill Restoration Plan and Environmental Assessment](#) - Florida Department of Environmental Protection.
- [Tampa Bay Surface Water Improvement and Management \(SWIM\) Plan](#) - Southwest Florida Water Management District

ECOLOGICAL THREATS AND PROBLEMS

The following are considered to be critical needs and priority action recommendations for the three Tampa Bay Refuges (Kleen and Hunter, USFWS, June 2006):

1. Control of predators, including raccoons, rats, and fish crows, is necessary to protect nesting birds. Colonies have been devastated by raccoon predation and predation by fish crows has increased in the recent past. Nesting colonies of birds on Pinellas NWR, particularly Tarpon, Indian, and Little Bird Keys, have been devastated by raccoons. More recently, depredation from fish crows is considered an increasingly serious problem. Rats have become a significant issue on Egmont Key NWR. Predator control on these islands is imperative.
2. Beach (Egmont Key NWR) and mangrove (Pinellas NWR) habitat must be protected and restored, where appropriate, to provide habitat for threatened loggerhead turtles, beach-nesting birds, and mangrove-nesting birds. Loss of habitat caused by severe erosion along the west beach of Egmont Key NWR is affecting the loggerhead sea turtle populations. An assessment and decision regarding beach renourishment for Egmont Key NWR (and possibly Passage Key NWR) is needed. An assessment and decision regarding a buffer establishment around all three refuges is needed.

Table 3. Monitoring, restoration, and research programs in Tampa Bay

Water and Air Quality

<u>Program</u>	<u>Agency</u>	<u>Budget</u>
Surface Water Monitoring	EPCHC	\$150,000.00
Surface Water Monitoring	Pinellas County	\$695,000.00
Beach Water Quality	Pinellas County	\$10,000.00
Bioassay Studies	Pinellas County	\$18,000.00
Surface Water, Benthic, and Air Quality Monitoring	Manatee County	\$289,500.00
Surface Water Monitoring	City of Tampa	\$400,000.00
Water Quality Monitoring	City of Clearwater	\$208,800.00
Surface Water Monitoring	Tampa Bay Water	unavailable
Water Quality, Benthic Studies, Air Quality Monitoring	EPCHC	\$979,000.00
Atmospheric Deposition	University of South Florida/EPA funded	unavailable
Benthic Nutrient Flux	FMRI	unavailable
Microbial Monitoring – Health Beaches	USF	unavailable
Non-point pollution control	USCG	\$264,000.00

Habitats

<u>Program</u>	<u>Agency</u>	<u>Budget</u>
Satellite monitoring shoreline vegetative habitat	FMRI, NOAA	unavailable
Watershed Characterization Studies	EPCHC, Pinellas County	unavailable
Sediment chemistry, grain size, benthos	Manatee and Pinellas Counties	unavailable
Seagrass aerial photography mapping	SWFWMD, TBRPC	\$150,000.00
Seagrass transect monitoring	City of Tampa Bay Study Group, SWFWMD-SWIM Program	\$350,000.00
Seagrass Restoration Techniques	FMRI	\$500,000.00
Seagrass Restoration Techniques	USF	\$40,000.00+
Labyrinthula Monitoring	FMRI	unavailable
Artificial Reef Program	EPCHC	\$90,000.00+
Benthic Quality (depth, temperature, salinity, dissolved oxygen, %silt/clay, contaminants)	HCEPC, SWFWMD	see above
Dredged Material Management – Habitat Restoration	USACE	unavailable

Living Resources

<u>Program</u>	<u>Agency</u>	<u>Budget</u>
Marine mammals, fisheries, sea turtle nesting	FMRI	unavailable
Mussel Watch and Oyster projects	NOAA	unavailable
Bird populations coastal colonies census	National Audubon Society	unavailable
Bird Sanctuary Program	National Audubon Society	unavailable
Oyster reef creation and monitoring	Tampa Bay Watch	unavailable
Scallop abundance	FMRI, Mote Marine, UNC Wilmington	unavailable
Reef fish, sessile invertebrates (Artificial Reef Program)	EPCHC	see above
Benthic taxa (abundance, diversity, evenness, dominant taxa)	EPCHC, SWFWMD	see above
Florida Marine Fisheries Monitoring (fisheries Dependent and independent)	FMRI	\$600,000.00+
Manatee carcass recovery, necroscopy 1974-1985	USGS/USFWS Sirenia Project	unavailable
Manatee monitoring	FMRI	
Marine Mammal Pathology Laboratory	Eckerd College/USFWS	unavailable
Dolphin Biology Research Institute (photo i.d., community structure) 1988-1993	Chicago Zoological Society/NMFS	unavailable

Dolphin research and monitoring	Mote Marine Laboratory	unavailable
Biology and habitat use of bottlenose dolphins	Eckerd College Dolphin Project	unavailable
Dolphin rescue, rehabilitation, mortality studies	Clearwater Marine Aquarium, Marine Mammal Pathology Lab, Mote Marine Lab, Tampa Bay Marine Animal Stranding Team	unavailable
Hydrobiological Monitoring (hydrology, water quality, benthic invertebrates, zooplankton/fish larvae, adult and juvenile fish, water dependent birds, habitat/vegetation indices)	Tampa Bay Water, EPCHC, SWFWMD, FMRI	\$950,000.00

Habitat Restoration Projects Since 1995 – Non-inclusive

<u>Program</u>	<u>Agency</u>	<u>Budget</u>
Lake Maggiore Restoration	SWFWMD	\$5,000,000.00*
Cockroach Bay Aquatic Preserve Restoration	FDEP, EPCHC, HCC	\$90,000.00+
Cypress Point Restoration	FDEP, ELAPP, SWFWMD-SWIM, City of Tampa et al.	\$45,000.00
South Parcel Restoration	SWIM, FDEP, EPCHC, Cargill	\$800,000.00*
General Habitat Restoration (numerous locations)	SWFWMD-SWIM	\$1,473,600.00*
Wetland Preservation and Restoration	EPCHC	\$840,000.00
Terra Ceia Aquatic Preserve and Buffer	FDEP, SWFWMD	\$5,000,000.00*

*denotes total budget rather than annual budget.

Sources:

Pribble et al. 1999, Hazen and Sawyer 1996, H. Greening pers. comm. Appendix 1 -- Non-inclusive list of monitoring, restoration, and research programs in Tampa Bay and estimated budgets.
http://gulfsce.usgs.gov/tampabay/reports/5yr_plan/index.html

Pribble R.J., Janicki A.J., Greening H. (eds.). 1999. Baywide Environmental Monitoring Report 1993-1998. Tampa Bay Estuary Program Technical Publication #07-99

Hazen and Sawyer (eds.). 1996. Funding Source Inventory for Comprehensive Conservation and Management Action Plans, Tampa Bay Estuary Program Technical Publication #14-95

Habitat restoration, including controlling exotic plants and planting native plants, is needed to maintain wildlife diversity. Control of exotics including Brazilian pepper and Australian pine needs to be continued.

Erosion is the foremost problem for Egmont and Passage Key NWRs. Alterations of the smooth, natural bottom topography near the mouth of Tampa Bay in the last century, including enlargement of natural channels and creation of new channels, spoil areas, turning basins, and causeways, has resulted in much scouring of Egmont Channel and Key (USFWS, "An Ecological Characterization of the Tampa Bay Watershed," 1990).

There is an immediate need to manage the dynamics of offshore sand transport to achieve sand accretion results and to begin to expand the key back to its original size. Egmont Key NWR has lost nearly half its acreage since 1877, and has lost nearly a third since 1969. In 1877, Egmont Key was 539 acres. In 1974, when the island was designated a national wildlife refuge, it was 392 acres. Presently, it is approximately 275 acres. Several historic structures are now covered by the encroaching sea, with others soon to follow (Florida Department of Environmental Protection, November 1996). The periodic dredging of nearby Egmont Channel is thought to have changed the transport of sand from the north thereby depriving the island of sediments that once maintained its larger size. Restoring Egmont Key NWR may require that the dredging practices in Egmont Channel be modified.

Two beach renourishment projects were operated by the Army Corps of Engineers (Corps) on the island. Presently, most of the southwest beach is gone and some upland area and historic structures are beginning to erode. Tampa Bay harbor navigation and maintenance includes removal of 250,000 cubic yards of material every 5 years just north of Egmont Key NWR in the Egmont Channel. The Corps has the option of using this dredged material either to renourish the west beach or dispose of it out at sea. The dredging of the channel may be accelerating erosion problems on the west shore more rapidly than anticipated, and as a result, the upland areas of the island are eroding as well. This will likely have a major impact to visitation of Egmont Key NWR if beach goes no longer have a beach at which to recreate (USFWS, "Visitor Services Report," March 2004).

If it is decided to regularly renourish beaches on Egmont and Passage Keys NWRs, the staff would need to pay particular attention to type and quality of beach sand being used. Guidelines have been established with respect to sea turtle nesting beaches. In addition, very frequent re-nourishment may lead to depletion of invertebrates in the substrate that may not be able to recover from the last event, therefore impacting foraging shorebirds.

Eradication measures for two exotic plants, the Brazilian pepper and the Australian pine, are now successfully in progress on Egmont Key NWR. Both plants have become pervasive and have altered and replaced the natural hammock community habitats. The coastal berm supports the island's native box turtle populations. Eradication of predators, namely rats, should be addressed in a more comprehensive manner.

The bird sanctuary area at the southern end of Egmont Key NWR is closed to all public use, year-round, and a vessel exclusion zone has been established around the seagrass beds on the east side of the island to protect them from propeller damage. Egmont Key NWR is designated as a critical habitat for piping plovers; however, public beach use may be interfering with foraging and roosting of these birds.

Egmont Key NWR is located within the undisputed lightning capital of the North America. The coastal scrub that was the original habitat land cover on the island is very pyrogenic and undoubtedly burned frequently. Fires, both natural and human caused, were rampant on the island during settlement years. A large fire was recorded in September 1891, when a coal shed spontaneously combusted near the lighthouse. The keeper and his family had to flee to the mainland until fire suppression support arrived three days later.

Since the abandonment of Fort Dade in 1923, wildfires from arson and lightning have swept the island on a few occasions. A large fire occurred on April 25, 1925, when federal agents started grass fires to smoke out smugglers and illegal immigrants. This fire destroyed eight homes, a coal storage facility, and the large ice house/power plant. In 1975, a lightning-caused fire swept across most of the island and consumed the remaining combustible materials left from Fort Dade. The fire destroyed much of the lower shrub understory and killed several palm trees. In recent years, there have been several small wildfires. Three of them were on the southern end of the refuge in the vicinity of the

pilot compound and may have posed a serious threat to the facilities there. An arson fire in 1995 destroyed the tile roof and consumed all flammable materials from the Fort Dade Guardhouse, which was the last intact structure from that period.

Fire has played a key role in the island's history, and controlled fire can be used to manage the island's habitats to benefit wildlife and to protect island facilities. A system of regularly scheduled prescribed burns every 5 to 10 years will control natural succession to maintain sea oats. Also, upland habitats infested with exotic plant species will be prescribed burned as needed to control plants regeneration and remove dead biomass.

The seven mangrove islands comprising the Pinellas NWR total about 394 acres. The Pinellas NWR islands are closed to the public due to their small size and critical importance to coastal bird species; however, illegal access by the public still occurs and causes birds to abandon their nests or flush from their nests, allowing predators (e.g., raccoons and fish crows) to move in. Also, offshore fishing is allowed and as such, birds nesting near shore may be disturbed by boaters.

Raccoons may be the sole factor for breeding bird failures on Tarpon Key and other keys, although fish crows and rats have contributed by depredating tree-nesting birds on Tarpon and Indian Keys. Some mangrove habitats have been lost due to erosion from boat wakes, storm tides, tropical storms, and hurricanes. Renourishment with oyster shells and planting of *Spartina* are recommended on Tarpon and Little Bird Keys to prevent further erosion and allow mangrove seedlings to take hold. Fishing line and other trash entangle birds, manatees, fish, turtles, and other wildlife and is a serious problem at Pinellas NWR – killing hundreds of animals each year.

The two main short-term management issues identified effecting mangrove-nesting species are (1) depredation, which, within recent years (when predator control has slacked off), has led to near complete abandonment of Tarpon and Whale Keys (among other islands on the refuge); and (2) through law enforcement presence, the need to ensure that human disturbance is not a factor where and when waterbirds are nesting on the refuge.

In addition to the above two major issues, three other long-term issues need to be considered: (1) island stabilization through re-nourishment; (2) removal of exotic vegetation; and (3) reduction of monofilament lines causing mortality (Kleen and Hunter, USFWS, June 2006).

Passage Key NWR is closed to the public and represents one of the last remaining nesting sites for laughing gulls, black skimmers, and royal terns in Tampa Bay. Easily accessible by boat from the Tampa/St. Petersburg Metropolitan area, Passage Key NWR has been inundated with humans to the point where the island has had to be closed to all visitors. Currently, you must observe the key from a distance of at least 300 feet.

Restoring Passage Key NWR would require analysis under the Wilderness Act to determine the "minimum tool necessary" to accomplish the task. Renourishment at Passage Key NWR should be considered. A decision needs to be made whether to take an active role in curbing erosion on Passage Key NWR or allow erosion to continue (not likely a natural process given potential connection to Tampa Bay dredging). If Passage Key NWR remains submerged for extended periods of time, it may no longer serve the purpose of a nesting island for migratory birds.

Common Concerns

Each year, an average 4 billion gallons of oil and other hazardous substances pass through Tampa Bay and Egmont Channel. These vessels, bound predominantly for one of the bay's three deepwater ports or its many industrial facilities, are joined by a variety of other cargo carriers, as well as a rapidly expanding cruise ship fleet. The potential for a catastrophic spill of petroleum or other toxic substances necessitates improving the region's overall emergency response readiness to avoid another major spill similar in nature to the 300,000 gallons of oil that were released following a dramatic three-way ship collision at the mouth of the bay in August 1993. The heavy recreational and commercial traffic in Tampa Bay and Egmont Channel has the potential to adversely impact the natural resources of Egmont Key NWR, Pinellas NWR, and Passage Key NWR if a spill occurs. Emergency response and agency coordination plans are needed (Tampa Bay Estuary Program, <http://www.tbep.org/baystate/spillprevention.html>).

Illegal public access to all three refuges causes birds to abandon their nests or flush from their nests, allowing predators to move in. A law enforcement presence is needed to discourage unauthorized human disturbances to nesting areas.

Small numbers of West Indian manatees are observed in the seagrass beds along the east side of Egmont Key NWR and occasionally around Passage Key and Pinellas NWRs, during the spring and summer. All habitats are outside refuge jurisdiction, but some foraging habitats (seagrass beds) are directly adjacent to the refuges. These foraging areas need to be protected from recreational/boating disturbances. A 30- to 300-foot submerged land buffer zone to protect bird nesting and seagrass foraging areas is needed, particularly around Egmont and Whale Keys.

Physical Resources

CLIMATE

(Source: Natural Resources Conservation Service, National Weather and Climate Center, Climate Reports, <ftp://ftp.wcc.nrcs.usda.gov/support/climate/soil-nar/fl/pinellas.doc>)

The Tampa Bay Refuges experience a subtropical climate, characterized by generally mild winters and hot, humid summers.

The average relative humidity in mid-afternoon is about 50 percent in April and May, and about 60-65 percent from July to September. Humidity is higher at night, and the average at dawn is about 90 percent in all months. The sun shines 60 percent of the time in summer and 63 percent in winter. The sunniest months are April and May, with 75 percent of possible sunshine. The prevailing wind is from the east in most months. Average wind speed is highest, between 9 and 10 miles-per-hour, from February to April.

Table 4 gives data on temperature and precipitation and growing degree days data for the survey area as recorded at St. Petersburg in the period 1971 to 2000.

In winter, the average temperature is 63.4 degrees F and the average daily minimum temperature is 55.6 degrees. The lowest temperature on record, which occurred at St. Petersburg on December 13, 1962, was 22 degrees. In summer, the average temperature is 83.1 degrees, and the average daily maximum temperature is 90.1 degrees. The highest temperature, which occurred at St. Petersburg on July 5, 1995, was 100 degrees. Actual temperatures on the refuges are moderated due to the coastal influence, which results in lower daytime highs and higher nighttime lows.

The average annual total precipitation is about 49.58 inches. The heaviest 1-day rainfall during the period of record was 12.20 inches at St. Petersburg on October 27, 1986. Thunderstorms occur on about 86 days each year, and most occur from June through September. Florida can receive a major portion of its yearly rainfall from hurricanes and tropical storms, usually in the summer and early fall. Florida had its worst drought in history between 1998 and 2000.

Measurable snowfall has never been recorded since records have been kept at St. Petersburg, beginning in 1948.

CLIMATE CHANGE AND GLOBAL WARMING

According to NOAA and NASA data, the Earth's average surface temperature has increased by about 1.2°F to 1.4°F since 1900. The ten warmest years in the 20th century have all occurred within the past 15 years, with the warmest two years being 1998 and 2005. Some climate models, based on emissions of greenhouse gases, primarily carbon dioxide, methane, and nitrous oxide, predict that average surface temperatures could increase from 2.5 °F to 10.4°F by the end of this century (U.S. Environmental Protection Agency, "Climate Change," <http://www.epa.gov/climatechange/>).

Effects of climate change and global warming will be changes in weather/rainfall patterns, decreases in snow and ice cover, rising sea levels, and stressed ecosystems. For the southeastern United States and Gulf coast, this can mean increased loss of barrier islands and wetlands; increased risk of shoreline flooding due to sea level rise, storm surge, and extreme precipitation events; greater likelihood of warmer/dryer summers and wetter/reduced winter cold; and, alterations of ecosystems and habitats due to these changes in weather patterns – to name but a few possibilities.

Global warming, resulting in melting of glaciers and ice sheets, will cause sea levels to rise. NASA estimates that yearly, 50 billion tons of ice is melting from the Greenland ice sheet. NASA aerial surveys show that more than 11 cubic miles of ice is disappearing from the ice sheet annually (Krabill, July 2000). Considering that land less than 10 meters above sea level contains 2 percent of the world's land surface but 10 percent of its population, in the United States major impacts will be felt by large numbers of people living on the low-lying coastlands, particularly the Gulf and East coast states.

Globally, sea level has risen 4–10 inches during the past century. The effects of rising sea levels are even more dramatic in Florida. Because of Florida's natural subsidence, south Florida's sea level has risen about 12 inches since 1846. It is still rising today, at a rate that is equivalent to 8-16 inches per century. That rate is 6-10 times faster than the average rate of sea level rise along the south Florida coast during the past 3,000 years. If the current trend continues without any additional global warming, the sea along the south Florida coast would climb another 3 inches by 2025 and 10 inches by 2100. Global warming is expected to accelerate this sea level rise. During the next 25 years, the sea is likely to rise 5 inches rather than 3. By 2100, the best available science indicates that south Florida seas will be approximately 20 inches higher than they were in 1990 (U.S. Environmental Protection Agency, "Climate Change," <http://www.epa.gov/climatechange/>).

In addition to the rising seas, changes in temperature and precipitation will affect plants and wildlife. A warmer climate could allow heat-loving pest species, such as the invasive Australian pine tree, to expand their range. However, warmer winters lead to fewer frosts, consequently, tropical plants and trees that are vulnerable to cold temperatures may benefit. Rapid sea level rise could harm low-lying mangrove communities. Florida's mangrove forests also provide food, nesting, and nursery areas for many animals—including more than 220 fish species, 24 reptile and amphibian species, 18 mammal species, and 181 bird species. In general, the response of mangroves to sea level rise depends on the type of mangroves, their environmental setting, the amount of freshwater available to maintain

root growth, and the sediment supply. Mangrove communities in south Florida already are affected by a number of stresses, including invasive Brazilian pepper plants, hurricanes, agricultural runoff, and human development. Climate change and a rise in sea level pose new stresses to an ecosystem already in danger (U.S. Environmental Protection Agency, "Climate Change," <http://www.epa.gov/climatechange/>).

A recent study of the effects of climate change on eastern United States' bird species concluded that as many as 78 bird species could decrease by at least 25 percent; while as many as 33 species could increase in abundance by at least 25 percent due to climate and habitat changes (Mathews, et al., 2004).

Table 4. Temperature and precipitation

(Recorded in the period 1971-2000 at ST PETERSBURG, FL7886)

Month	Temperature				Precipitation		
	Average daily maximum	Average daily minimum	Average	Average number of growing degree days*	Average	Average number of days with 0.10 inch or more	Average snowfall
	⁰ F	⁰ F	⁰ F	Units	In		In
January-----	70.1	54.5	62.3	389	2.76	4	0.0
February----	71.6	55.8	63.7	390	2.87	4	0.0
March-----	76.1	60.5	68.3	568	3.29	4	0.0
April-----	80.7	65.1	72.9	686	1.92	2	0.0
May-----	86.2	71.1	78.6	888	2.80	3	0.0
June-----	89.5	75.3	82.4	972	6.09	7	0.0
July-----	90.6	76.6	83.6	1040	6.72	10	0.0
August-----	90.2	76.6	83.4	1035	8.26	11	0.0
September---	88.6	75.5	82.1	962	7.59	9	0.0
October-----	83.5	69.9	76.7	828	2.64	3	0.0
November----	77.2	63.0	70.1	604	2.04	3	0.0
December----	71.8	56.6	64.2	447	2.60	3	0.0
Yearly:							
Average---	81.3	66.7	74.0	---	---	---	---
Extreme---	100	24	---	---	---	---	---
Total-----	---	---	---	8810	49.58	63	0.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees. F)

GEOLOGY AND TOPOGRAPHY

The Tampa Bay area is a product of the fluctuations in sea level caused by Pleistocene and earlier glaciation. During times of lowered sea level, the river valley of Tampa Bay was cut into underlying limestones by the paleo-Hillsborough, Manatee, and Alafia Rivers. As sea level rose during glacial retreat (beginning 6,000 to 8,000 years ago and ending between 3,000 and 5,000 years ago), the area was flooded and became Tampa Bay (Doyle 1985). Prior to this flooding the sea level was 100 meters lower than present and land extended 160 kilometers farther west.

Rock formations in the region are Tertiary marine carbonates that are thousands of feet thick, deposited over millions of years of geologic time. Geologic formations comprising the upper 1,000-1,500 feet of this carbonate platform are most important in terms of groundwater development and ecological watershed management. Underlying Tampa Bay are limestones and dolomites of Oligocene age and older. The Miocene St. Marks/Tampa formation, which consists of dolomitic limestones interbedded with terrigenous clastics, directly underlies the unconsolidated surface sediments in the northern portion of the Bay. The Hawthorn formation is absent in the northern portions of Tampa Bay but is present at the surface throughout the lower two-thirds of the bay. The Hawthorn Formation also outcrops along portions of eastern Tampa Bay (Doyle 1985; Southwest Florida Water Management District 2002). In the vicinity of Egmont Key NWR, the Hawthorne Group sediments are approximately 325-feet thick and are found about 50-60 feet below MSL. St. Mark's/Tampa Formation (a remnant layer of the Hawthorn Formation contiguous throughout central Florida) is composed of sandy, chalky limestone. In some locations, the upper portion of the deposit is composed of calcareous sands and clays, graduating downward into unconsolidated or loosely cemented lime mud. The base of this formation is typically marked by beds of clayey sand (Tampa City Council – Hillsborough County City-County Planning Commission, January 1998).

The stratigraphy of this section, in descending order, includes: the Miocene age Arcadia Formation (Tampa Member) of the Hawthorn Group; the Oligocene Suwannee Limestone; the upper Eocene Ocala Limestone; and, limestones and dolostones of the middle Eocene Avon Park Formation. Composition of these formations range from a sandy, phosphatic, dolomitic limestone of the Tampa Member, to relatively pure calcium carbonate limestones of the Suwannee and Ocala Limestones. The Avon Park Formation is composed of both limestone and thick units of recrystallized dolomite, forming highly permeable beds of dolostone (Southwest Florida Water Management District 2002).

In the deeper water portions of Tampa Bay, the Pleistocene river valley has down cut as much as 90 feet (30 meters) into the underlying limestones. This archaic bed has filled in with unconsolidated estuarine and fluvial sediments. Recently deposited sediments are quartzitic with carbonate mixtures. Bay sediments are derived from reworked terrace deposits, transport of suspended loads from rivers, in situ production and weathering of shell, and inshore movement and deposition of sediment from the Gulf of Mexico. Immense deposits of marine mollusk shells are found in many areas of Tampa Bay and are mined for use as fill. Very recent fine-grained silts and mud deposits may also be present in part of the bay, especially near river mouths and tidal creeks. There are up to 20 meters of unconsolidated sediments in parts of Tampa Bay (Southwest Florida Water Management District 2002).

The alternating high and low sea levels during the Pleistocene and Holocene shaped the land surface of the Tampa Bay region. The region is low in elevation, with elevations ranging from a depth of 94 feet below sea level at the mouth of the Bay up to a height of 105 feet above sea level in Clearwater. The Tampa Bay watershed area consists of mostly flat plains with little relief. It is a heterogeneous region containing barrier islands, coastal lagoons, marshes, and swampy lowlands along the Gulf and Atlantic coasts. Tampa Bay is the most prominent geographic feature in the region. The dominant

landforms are marine terrace deposits, representing former sea level positions over recent geologic time. These marine terraces have been modified over time by wind, erosion, and sinkholes, resulting in the present day topography and land cover.

The Gulf Coastal Lowlands, the dominant landform in the western area of the basin, adjoin Tampa Bay. These relict marine terraces (ancient shorelines) have low relief over broad plains bordered by slopes. Major municipalities, such as the cities of Tampa and St. Petersburg, are located in the lowlands.

To the east, Florida's Central Highlands is an area of discontinuous highlands, containing numerous lakes, characterized by many ridges and depressions without any well-defined system of surface streams or outlets, and with elevations up to 300' MSL (Florida Department of Environmental Protection, "Basin Status Report," November 2001).

Karst features exist throughout the Tampa Bay area, the sinkholes that develop in this porous limestone terrain typically result in shallow, bowl-shaped depressions and a generally rolling topography (Florida Department of Environmental Protection, "Basin Status Report," November 2001).

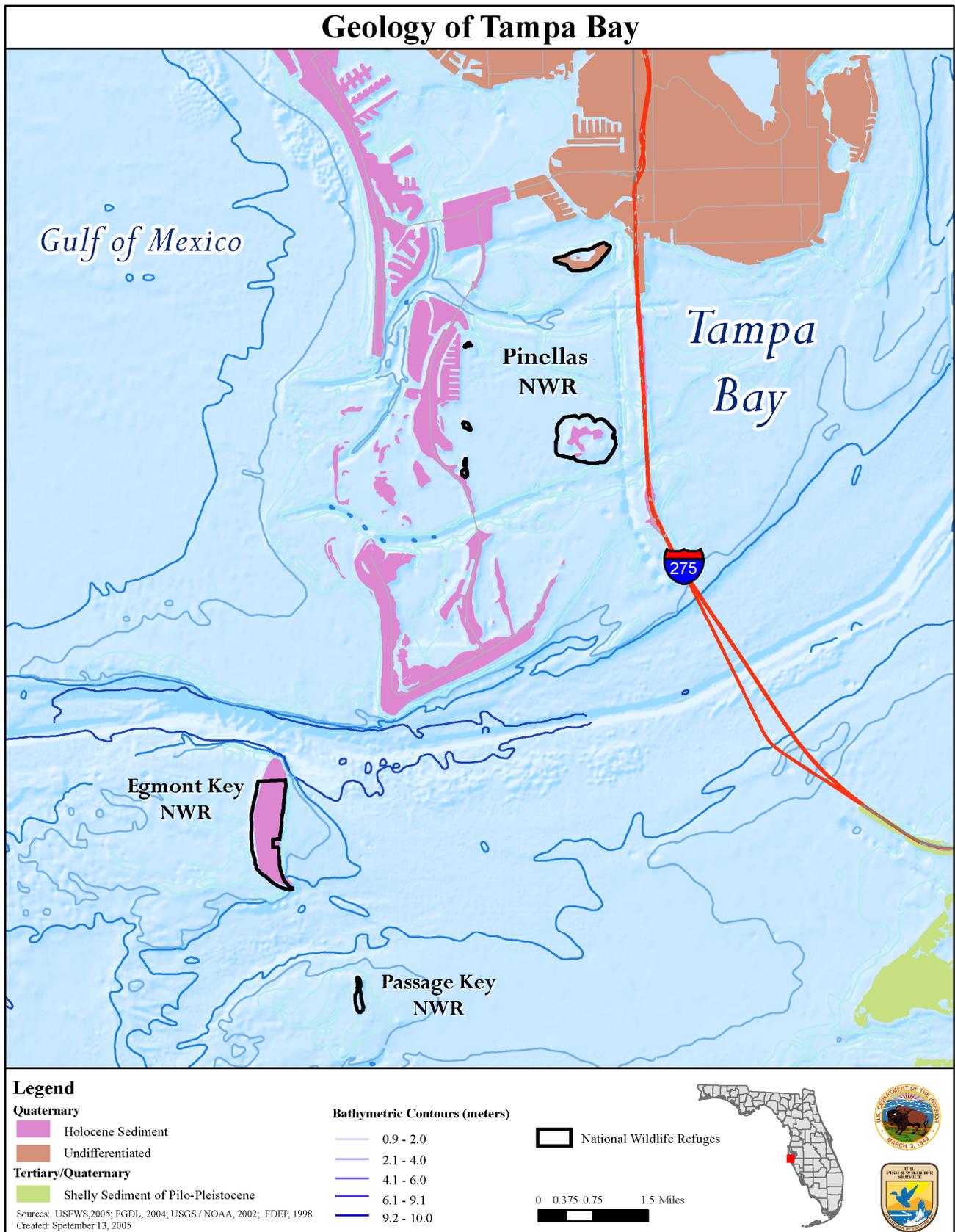
Egmont Key NWR is nearly two miles long, of relatively uniform width, and is approximately 2,250 feet across at its widest point. It is not considered a barrier island. The Key has little topographic relief, and its average elevation is about 5 feet above MSL. Complete inundation of the island has occurred in the past during hurricanes and tropical storms. Topographic features are continuously changing, influenced by wind, surf, tides, coastal currents, and storms. These forces constantly alter the distribution and elevation of marine-derived sediments which comprise the island. In 1875, Egmont Key was approximately 50 percent larger than it is today (Florida Division of Recreation and Parks, February 1998).

A general depiction of the geology in the Tampa Bay area is presented in Figure 13.

SOILS

In central and south Florida, the soils or uppermost sediments are geologically young and are surficial; that is, the soil profiles reflect changes in sediment types rather than development of chemically or mechanically produced horizons. For example, one is likely to observe sands layered over marsh-produced calcareous marl, particularly in coastal areas. Each soil is an indicator of preexisting conditions (i.e., parent materials). Soils are organized into a taxonomic classification system by the U.S. Department of Agriculture, Natural Resources Conservation Service, in which each soil is categorized by order, suborder, great group, subgroup, family, and soil series. Nationwide, there are ten orders of soil, four of which (*Entisols*, *Spodosols*, *Ultisols*, and *Histosols*) dominate Florida's landscape. *Spodosols* are the dominant soil order in the Tampa Bay area; of which of *Aquods* (a suborder of *Spodosols*) has the largest total acreage. *Aquods* are acidic, wet, poorly drained, sandy soils overlying an organic stained subsoil layer, of which the Myakka series is the most common and well known. Myakka fine sand is the official state soil of Florida, is the most extensive soil in the state, and does not occur in any other state. Pine flatwoods are well-suited for this type of soil, and it is also found in flats, depressional, tidal, and floodplain landforms (USFWS "An Ecological Characterization of the Tampa Bay Watershed," 1990; USDA Natural Resources Conservation Service), http://soils.usda.gov/survey/online_surveys/florida/; http://www.mo15.nrcs.usda.gov/news/state_soils/fl_ss.html).

Figure 13. Geology of Tampa Bay



Soils of the Tampa Bay area are derived from marine deposits known as the Suwannee, Tampa, Hawthorn and Bone Valley formation laid down during the late Oligocene and lower and middle Miocene periods. These geologic formations were further modified by the marine environment and fluctuating sea levels during Pleistocene and recent times (Southwest Florida Water Management District SWIM Section, February 1999).

Soils associated with the barrier islands of the Tampa Bay watershed are dominated by the sandy *Entisols* soil order, of which Quartzpsamments (a great group of *Entisols*) is the most abundant. Quartzpsamments are extremely sandy soils with little or no soil profile, of which the Canaveral Fine series is the most common. Canaveral Fine is characterized as a moist mineral soil, with sand and shell fragments and a thin accumulation of organic material at or near the surface. These tan-colored, well-oxidized soils are composed of mixed carbonate shell material and fine- to medium-grained quartz sand (USFWS, "An Ecological Characterization of the Tampa Bay Watershed," 1990).

Surficial sediments of Egmont Key NWR (and presumably Passage Key NWR) are comprised of post-Pleistocene undifferentiated sand and shells. The entire Egmont Key NWR (and presumably Passage Key NWR) is classified under a single soil type, St. Augustine fine sand. St. Augustine fine sand is nearly level and somewhat poorly drained and is found on flats and ridges bordering Tampa Bay (USDA Soil Conservation Service et.al., 1989, "Soil Survey of Hillborough County, Florida). Typically, this soil has a surface of dark gray sand, underlain to a depth of about 12 inches with light brownish gray fine sand. The middle part, to a depth of about 30 inches, is light gray, mottled fine sand containing balls of sandy clay. The lower part, to a depth of about 80 inches, is gray fine sand. Beach and dune sand and shell normally prevail on the western side of the Keys, where greater tidal, wind, and current forces are exerted.

Hydrology

Groundwater. Groundwater is the largest and most readily available source of potable water in Florida. Three different aquifer systems can be found in the parts of Florida where springs are common. They are the shallow Surficial Aquifer, the Intermediate Aquifer, and the Limestone Floridan Aquifer. In some areas, all three aquifers may exist in sequence, separated by impermeable layers. In other areas, only the Floridan Aquifer may be present, and it may be exposed to the surface waters by sinkholes and other karst features. Karst topography in the Tampa Bay region interconnects groundwater and surface water. Spring flow and seepage constitute the base flow of many streams; freshwater wetlands retard and store floodwaters and enhance infiltration to groundwater; and stream discharges to estuaries are critical for maintenance of salinity regimes. These interrelationships are the basis of the state's and this region's ecological systems (Southwest Florida Water Management District, July 2005). This characteristic also leaves the underlying Floridan Aquifer vulnerable to pollution infiltration.

In general, the Floridan Aquifer acts as a single, interconnected hydrologic unit, with large quantities of water found within openings along faults, joints, bedding planes, and other fractures. The Floridan Aquifer system is the principal source of groundwater production in the Tampa Bay region, and is capable of yielding greater than 5,000 gallons per minute (GPM) from fully penetrating wells. Water produced from the Floridan Aquifer is primarily used for industrial and domestic purposes (Tampa City Council – Hillsborough County City-County Planning Commission, January 1998).

Egmont Key NWR is underlain by the Floridan Aquifer. There are no public wells on Egmont Key NWR and available water capacity is low. The Key may lie in a zone where no potable water is available from the Floridan Aquifer. U.S. Geological Survey potentiometric surface data suggest Egmont Key NWR is in an area of zero recharge to the Floridan Aquifer system. In the transition

zone, which separates freshwater and saltwater, south and southwest of Tampa Bay, relatively high concentrations of sulfate and chloride make the groundwater non-potable. On Egmont Key NWR, a reverse osmosis treatment system is located and operated by the Tampa Bay pilots. This system converts readily available saltwater into non-potable water used primarily for cleaning and bathing. All drinking water must be brought in from the mainland. Treated water from the pilot's water system must be trailered up to the park manager's residence on a weekly basis. In most years, the water table at Egmont Key NWR ranges from 3 to 4 feet below land surface (Fernandez 1996). Seasonally, the high water table is at a depth of 20-30 inches for 2 to 6 months and recedes to a depth of about 50 inches during prolonged dry periods. Prior to the Colonial era, freshwater on Egmont Key probably consisted only of rainwater pools and puddles. The presence of at least two species of frogs suggests temporary pond formation occurred often enough for reproductive success. There are now several cisterns and old foundations which also trap and hold rain water (Florida Division of Recreation and Parks, February 1998).

Surface Water. The west-central coast of Florida, bordering the Gulf of Mexico, is a low-energy, microtidal (less than 0.5 m tidal amplitude) region that is constantly changing as a result of active coastal processes that are directly linked to meteorological events. Wind-driven waves and tidal currents are the most important geological agents controlling sediment transport and evolution of the Gulf and bay shores. Astronomical tides in the Gulf of Mexico are mixed and typically have a range of less than 1 m. Water levels vary only about 0.5 m between high- and low-tide during a normal tidal cycle. Non-storm waves in the eastern Gulf of Mexico are normally less than 0.3 m high, and wave energy decreases to the north where the Gulf shore consists of marsh (USGS Coastal and Marine Geology Program, "Coastal Classification Atlas, West-Central Florida Coastal Classification Maps – Anclote Key to Venice Inlet," <http://pubs.usgs.gov/of/2003/of03-227/process.html>).

More specifically, tides in Tampa Bay are a mixture of lunar (semidiurnal) and solar (diurnal) gravitational effects. Two unequal high and low tides occur daily, with an average range of about 2.3 feet. Tides produce currents of about 6 feet per second during ebb tide and about 4 feet per second during flood tide in Egmont Channel at the mouth of the bay. During hurricanes and tropical storms, the associated storm surge from high winds and low barometric pressure also affects water movement in the bay. The highest recorded storm tide was 15 feet in 1848 (Tampa Bay Estuary Program, "Baywide Environmental Monitoring Report, 2002-2005," December 2006).

Groundwater discharges to the bay are seasonal and greatest during and after the wet season. The roles of groundwater discharge in bay ecology are poorly understood, but can be postulated as (a) reducing peak runoff rates and constituent loads; (b) prolonging estuarine conditions along shorelines and in marshes or mangrove forests; and (c) creating favorable refugia and nursery areas for marine life in tidal creeks. Drainage of uplands around the bay has concentrated the different flows of surficial groundwater discharge, routed it to major stormwater outlets, and altered the hydrology and constituent loads of manmade tributaries so that many of the benefits of diffuse flows have probably been lost (Southwest Florida Water Management District, February 1999).

Surface water flows are not only a product of runoff, but also include a groundwater baseflow component. In fact, many surface water systems in west-central Florida are closely interconnected with the underlying groundwater system through springs and sinkholes. In accordance with hydrologic conditions, these natural interconnections may augment flow, reduce flow, or perform both functions intermittently. Because this region manifests annual wet and dry seasons with significant variations in precipitation frequency and intensity, the contribution of surface runoff and groundwater baseflow to streams varies. This cyclic pattern of changing baseflow conditions results in variable surface water quantity and quality. Rain and thus stream flows are generally lowest during April and May. Unfortunately, high municipal water demands historically occur during this same seasonal time

period, primarily due to corresponding increased outdoor irrigation. The low monthly minimum flows during peak consumptive periods have required the development of a large storage reservoir on the Hillsborough River in order to ensure an adequate supply (Tampa City Council – Hillsborough County City-County Planning Commission, January 1998).

Tampa's surface water system includes three major drainage basins, all of which ultimately discharge into either Old Tampa Bay or Hillsborough Bay, sub-sections of Tampa Bay. These basins are the Hillsborough River basin, the Palm River/Tampa Bypass Canal basin, and the upper Tampa Bay/Northwest Hillsborough basin. These drainage systems transport an average of more than 400 million gallons per day of freshwater from uplands in Hillsborough County and adjacent areas to the Tampa Bay estuary (Tampa City Council – Hillsborough County City-County Planning Commission, January 1998).

AIR QUALITY

The Clean Air Act (CAA) of 1970 (as amended in 1990 and 1997), required the U.S. Environmental Protection Agency (EPA) to implement air quality standards to protect public health and welfare. National Ambient Air Quality Standards (NAAQS) were set for six pollutants commonly found throughout the United States: lead, ozone, nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), and particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}).

The Florida Division of Air Resource Management operates National Ambient Monitoring Stations (NAMS) and State and Local Ambient Monitoring Stations (SLAMS) to measure ambient concentrations of these pollutants. Ambient air data are collected by over 200 monitors in 34 counties throughout the state (Florida Department of Environmental Protection, Division of Air Resource Management, "Florida Air Monitoring Report, 2004." <http://www.dep.state.fl.us/Air/publications/techrpt/amr.htm>). Areas that meet the NAAQS standards are designated "attainment areas," while areas not meeting the standards are termed "non-attainment" areas. While no pollutant monitoring data are available for the Tampa Bay Refuges per se, air quality is monitored on a regular basis by over 60 monitors in the 4-county region (Hillsborough, Manatee, Pasco, and Pinellas Counties). The 2005 monitoring results indicate that all of the Tampa Bay area qualifies as an attainment area for all monitored pollutants, and that improvement is being noted, see Tables 5 and 6. "Maintenance areas" are areas previously classified as non-attainment areas, which have successfully reduced air pollutant concentrations to below NAAQS standards. As a result of improved air quality, in 1996, Hillsborough and Pinellas Counties were designated as maintenance areas for ozone; and, Hillsborough County a maintenance area for lead (Florida Department of Environmental Protection, Division of Air Resource Management, "Florida Air Monitoring Report, 2004." <http://www.dep.state.fl.us/Air/publications/techrpt/amr.htm>).

The Air Quality Index (AQI) is a summary index for reporting daily air quality. It tells how clean or polluted the air is, and what associated health effects might be of concern. The AQI focuses on health effects that may be experienced within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the CAA: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. (Note: Lead is also considered a major air pollutant under the CAA. However, because all areas of the United States are currently attaining the NAAQS for lead, the AQI does not specifically address lead). For each of these pollutants, EPA has established national air quality standards to protect public health (US Environmental Protection Agency, "AirNow," <http://www.airnow.gov/>). Compared to other metropolitan areas in Florida, the Tampa Bay region has had the least number of good days for air quality. But overall, the average air quality has been improving (Tampa Bay Regional Planning Council, September 2005).

Table 6

Air Quality Trends - Tampa - St. Petersburg - Clearwater MSA, 1990-2005^a

Pollutant	Trend Statistic	Number of Trend sites	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
CO	2nd Max	2	4.5	3.2	3.3	2.4	2.4	3.1	2.5	2.7	3.0	2.3	2.1	2.3	2.2	1.8	1.5	1.5
NO ₂	Annual Mean	2	0.013	0.012	0.011	0.011	0.010	0.011	0.011	0.011	0.011	0.013	0.012	0.011	0.011	0.010	0.009	0.008
O ₃	4th Max	7	0.080	0.070	0.074	0.071	0.075	0.075	0.074	0.080	0.089	0.084	0.081	0.081	0.069	0.077	0.074	0.075
O ₃	2nd Max	7	0.106	0.097	0.094	0.093	0.093	0.096	0.098	0.099	0.111	0.108	0.100	0.104	0.086	0.101	0.090	0.093
PM _{2.5}	Weighted Annual Mean	5	27.2	27.4	25.9	27.0	25.6	24.8	26.4	26.9	26.8	26.0	26.6	25.6	22.2	23.0	22.4	22.9
SO ₂	Weighted Annual Mean	2										12.3	12.9	11.5	10.5	9.9	10.5	10.7
SO ₂	Annual Mean	7	0.0066	0.0058	0.0052	0.0059	0.0055	0.0046	0.0046	0.0048	0.0048	0.0051	0.0041	0.0041	0.0042	0.0036	0.0028	0.0025

Note: Data from exceptional events are not included. These trends are based on sites having an adequate record of monitoring data during the trend period.

The values shown are the composite averages among these trend sites.

Units for CO, NO₂, O₃, and SO₂ are ppm. Units for PM_{2.5} are ug/m³.

The 4th max for ozone is based on 8-hour data. The 2nd max for ozone is based on 1-hour data.

^a U.S. Environmental Protection Agency, <http://www.epa.gov/airtrends/factbook.html>

WATER QUALITY

Salinity in Lower Tampa Bay, in Egmont Channel, generally ranges over 25-38 ppt. Surface salinities are normally 1-2 ppt (parts per thousand) less than those near the bottom. Minimum salinities occur in September of each year, with maximum salinities in June. Like salinity patterns, temperature patterns in Tampa Bay show little variation with water depth. The annual average water temperature differs by less than 1° C (1.8° F) from the surface to the bottom. Between June and August, maximum water temperatures are 28° to 30° C (82° to 86° F), with minimum temperatures of 15° to 18° C (59° to 64° F) from December through February. Seasonal temperature patterns are similar throughout the bay (Tampa Bay Estuary Program, December 2006).

Based on information collected in 2000, EPA's National Estuary Program Coastal Condition Report rated the overall water quality of Tampa Bay as fair. Using information collected by the Tampa Bay's Estuary Program, the rating used five component indicators: nitrogen, phosphorous, chlorophyll-a, water clarity, and dissolved oxygen conditions in Tampa Bay. All indicators rated good or fair, with the exception of water clarity, which rated poor. Expectations for water clarity were higher because of efforts to re-establish seagrasses in Tampa Bay (Tampa Bay Estuary Program, June 2007).

Although nitrogen is an essential plant nutrient, excess amounts of nitrogen can cause algae blooms and reduced oxygen levels in the bay, resulting in turbid water, fish kills, and loss of seagrass when the water becomes so cloudy that sunlight cannot reach grass blades. Stormwater accounts for about 63 percent of total nitrogen loadings to Tampa Bay and about 21 percent comes from atmospheric deposition (air pollution) directly to the bay's surface, either with rainfall or dry deposition. Nitrogen load reductions to Tampa Bay since the late 1970s have resulted in improvements in both water clarity and quality. These improvements are believed to have led to an increase of seagrass acreage that began in the early 1980s, averaging about 250 acres per year, over the past two decades (Tampa Bay Estuary Program, "Baywide Environmental Monitoring Report, 2002-2005," December 2006; Tampa Bay Estuary Program, <http://www.tbep.org/baystate/waterquality.html>).

Despite improvements in water quality in Tampa Bay, most of the bay is closed to shellfish harvesting because of the risk of bacterial contamination from pollutants carried in runoff from the land. Consuming shellfish from such waters could result in a variety of illnesses, ranging from diarrhea to infectious hepatitis. To protect public health, it is actually against the law to possess shellfish, such as oysters or clams taken from waters that are closed to shellfish harvesting. Two areas of Tampa Bay, near Fort DeSoto in Pinellas County and in portions of Tampa Bay in Manatee County, are conditionally approved for shellfish harvesting; however, these areas are typically closed to harvesting following heavy rains, which wash bacteria-laden pollutants into the water. Information about the status of these two conditionally approved harvesting areas is available by calling the state's regional aquaculture, <http://www.floridaaquaculture.com> (Tampa Bay Estuary Program, <http://www.tbep.org/eyesonthebay/greenmussels.html>).

Red tides occur in the Gulf of Mexico almost every year, generally in the late summer or early fall. They are most common off the central and southwestern coasts of Florida. The Florida red tide organism, (*Karenia brevis*), produces a toxin that can kill marine animals and affect humans. Scientists have studied this organism for more than 50 years. The Florida red tide organism was identified in 1947, but anecdotal reports of the effects of red tide in the Gulf of Mexico date back to the 1530s. Most blooms last 3 to 5 months and may affect hundreds of square miles. Occasionally, however, blooms continue sporadically for as long as 18 months and may affect thousands of square miles. Red tides can kill fish, birds, and marine mammals; cause health problems for humans; and adversely affect local economies. When (*Karenia brevis*) reaches cell counts of 5,000 cells per liter of

seawater, shellfish beds in the area are closed, sometimes for months at a time, until it is safe to harvest again. A protracted and intense red tide bloom affected Tampa Bay and surrounding waters during 2005. Originating south of Tampa Bay, the bloom was first detected at medium to high levels at the mouth of the bay on June 10, 2005, moving into the lower bay by July 6. The medium to high levels as indicated by pink and red dots correspond to cell counts greater than 100,000 cells per liter, levels consistently associated with fish mortalities. These elevated cell counts persisted within Tampa Bay through the beginning of October 2005 (Florida Fish and Wildlife Conservation Commission, "2005 Red Tide Impacts on Fish Spawning in Tampa Bay," http://research.myfwc.com/features/view_article.asp?id=27503 and "Red Tides in Florida," http://research.myfwc.com/features/view_article.asp?id=24936).

Excessive concentrations of mercury have been found in Tampa Bay (and in fact all of Florida's coastal waters) affecting commercial and sport-fishing interests. A much better understanding of local, regional, and global sources, amounts, and effects of mercury on Florida waters and fisheries is needed. Most Florida seafood contains low to medium levels of mercury. As a result, the State of Florida has issued human health advisories regarding consumption of fish for several species. "Do not eat" advisories have been issued for all of Florida coastal and marine waters for king mackerel, shark, blackfin tuna, cobia, and little tunny. Moderate risk and low risk fish consumption advisories have also been issued for a number of other marine and estuarine fish species (Florida Department of Health, Division of Environmental Health, "Your Guide to Eating Fish Caught in Florida," <http://doh.state.fl.us/floridafishadvice/>; and National Science and Technology Council, June 2004).

A potential groundwater contaminants site at the base of the lighthouse on Egmont Key NWR was investigated and was determined not to be significant. The USCG supposedly had dumped the old batteries from the lighthouse at its base. Additional surveys were conducted within Fort Dade at some potential sites for oil contamination (oil house for the train), and no oil was found (Kleen and Hunter, USFWS, June 2006).

BIOLOGICAL RESOURCES

HABITAT

Egmont Key NWR is an offshore island, not a true barrier island. Its habitat provides nesting, feeding, and resting habitat for brown pelicans, terns, and other colonial nesting waterbirds. It also provides habitat and protection for endangered species, such as manatees, sea turtles, and others. Egmont Key has a long history of human habitation (Section A, Chapter II, Refuge History), and its habitats are highly modified by both exotic plants and past human habitation. The primary vegetation types include sea oat (*Uniola paniculata*) meadows, Australian pine (*Casuarina equisetifolia*) groves, and extensive forests with a mixed cabbage palm (*Sabal palmetto*) – Australian pine-Brazilian pepper (*Schinus terebinthifolius*) overstory (Dodd, March 1998). Brazilian pepper and Australian pine occur throughout the interior of the Key, interspersed with cabbage palms, sea grapes, red cedar, wax myrtle, and strangler fig.

Egmont Key NWR contains five distinct natural communities (plus ruderal and developed areas) (Florida Division of Recreation and Parks, February 1998):

- Coastal berm – Storm-deposited sand and shell berms which develop ridges paralleling the shoreline. Dominant plant species on Egmont NWR are cabbage palm, strangler fig, poison, ivy, Spanish stopper, saw palmetto, sea grape, and Florida privet. A small number of southern red cedars also occurs. Gopher tortoise burrows are frequent in the coastal berm community. This community is extensively and heavily infested with the exotic Brazilian pepper.

-
- Beach dune – Dunes are formed by wind and wave action and are characterized by low-growing pioneer plants. Sea oats, sand spur, railroad vine, and hairy beach sunflower are found here.
 - Marine unconsolidated substrate – Sandy beaches are best developed on the western shore of the Egmont Key NWR, where Gulf waves strike the shoreline. This natural community supports marine invertebrates, amphipods, shrimp, and crabs, which, in turn, support vertebrates, such as redfish and flounder. This sandy beach community provides essential habitat for shorebirds, such as terns, skimmers, oyster catchers, plovers and sandpipers.
 - Coastal grassland – The coastal grassland community is found on the west-central part of the island. It is transitional between coastal berm and dune, lacking the woody species of the coastal berm – trees and shrubs are few. Common plants include sea oats, tall threeawn grass, muhly grass, beach panicum, sand spurs, and seaside gentian.
 - Marine grass beds – Seagrass beds are just beyond the sheltered, eastern shore. Three species of seagrass (e.g., shoal grass, turtle grass, and manatee grass) are found.

A summary depiction of the habitats found on Egmont Key NWR is presented in Figure 14.

Seagrass beds are important habitat in Tampa Bay and are identified in Figure 15. The seagrass area on the east of Egmont Key NWR (about 29 acres) is protected. Both manatees and sea turtles are observed in the Tampa Bay vicinity waters (Figure 16), and, in particular, manatees are occasionally seen in the proximity of the seagrass beds along the eastern shore of Egmont Key NWR. Approximately 20-70 endangered Atlantic loggerhead turtles nest from May to October along the island's shoreline and would benefit from removal of Australian pine whose shallow root system interferes with nest building. Controlling Brazilian pepper and Australian pine restores natural habitat and also enhances nesting habitat for least terns, a state threatened species. Both exotic plants have become pervasive and have altered the native hammock community habitats, which support the island's large native box turtle populations. There is an ongoing control program for the exotics Brazilian pepper and Australian pine. Garlon 4 herbicide has been applied directly to exotics, Australian pines have been girdled, and much Brazilian pepper has been cut. The south end of Egmont Key NWR (about 97 acres) is a protected wildlife sanctuary. The south end wildlife sanctuary provides the most important resting and nesting site for plovers, terns, and other shorebirds.

Pinellas NWR contains seven mangrove islands, encompassing about 394 acres. The refuge is comprised of Little Bird, Mule, Jackass, Listen, Whale, Tarpon, and Indian Keys. The submerged lands in the area of the refuge include both hard and soft bottom habitats, seagrass beds, and oyster reefs. The shoreline is protected by mangroves. Mangrove areas and scattered openings within the mangrove provide excellent foraging and resting habitat for herons, ibis, wood storks, and waterfowl. The mangrove islands are used as rookeries by the larger wading birds (e.g., herons, ibis, and egrets) and also for nesting by vireos, warblers, and mangrove cuckoos (Pinellas County Department of Engineering and the Department of Environmental Management, August 1987). In the last few years, mangrove habitat has been lost due to erosion from boat wakes, storm tides, tropical storms, and hurricanes.

Three species of mangroves occur within the refuge: red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), and white mangrove (*Laguncularia racemosa*). The predominant salt marsh plant is black needlerush (*Juncus roemerianus*). The zonation of the salt marsh normally starts with smooth cordgrass (*Spartina alterniflora*) occurring at the shoreline or behind a fringe of mangrove. Landward of the smooth cordgrass, black rush is usually found. Further landward of the

Figure 14. Vegetation types of Egmont Key NWR

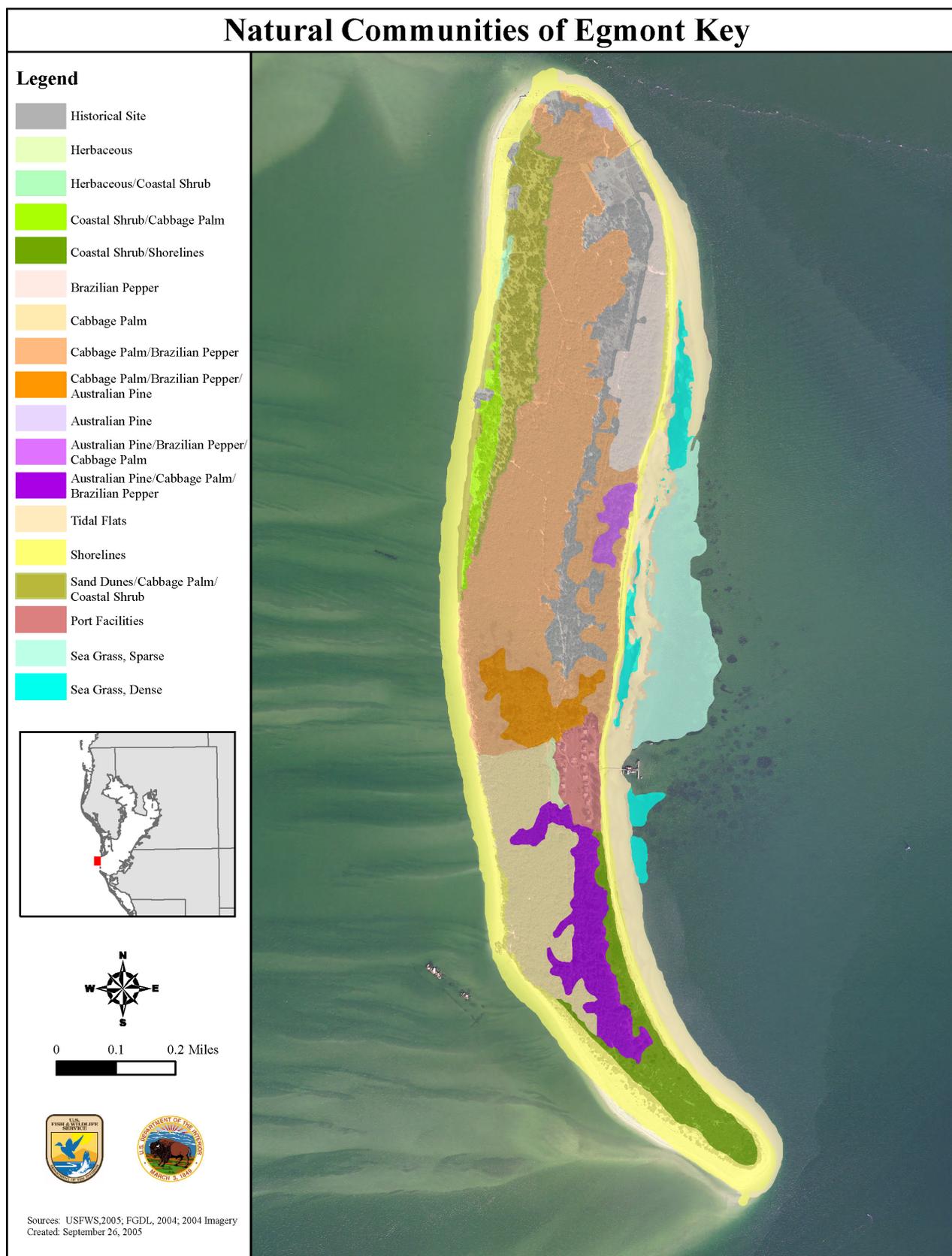
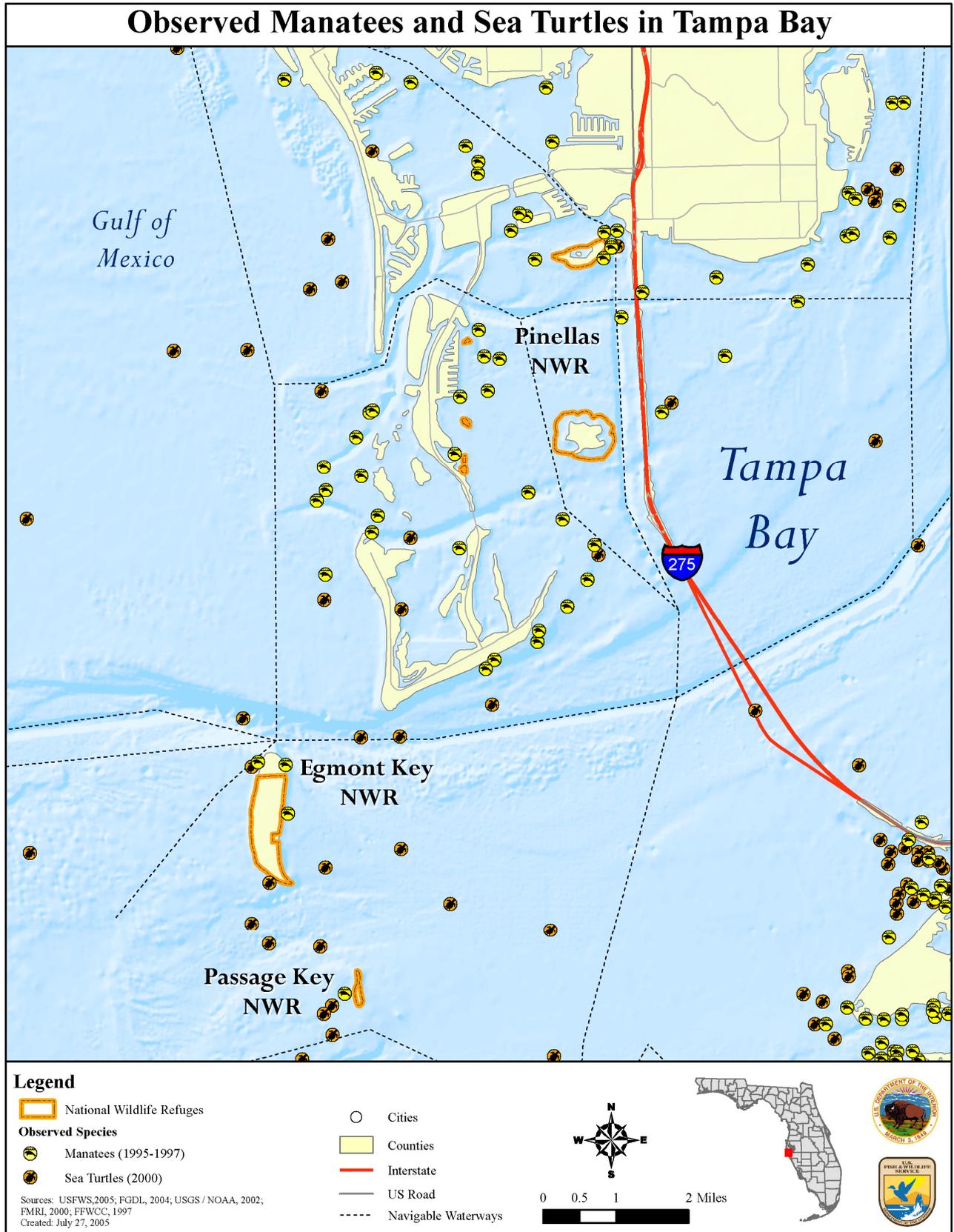


Figure 15. Seagrass beds in Tampa Bay



Figure 16. Observed manatees and sea turtles in Tampa Bay



black rush is vegetation, such as seashore saltgrass (*Distichlis spicata*), glasswort (*Salicornia perennis*), and saltwort (*Batis maritima*). Five species of marine grasses are found in the refuge area: turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), widgeon grass (*Ruppia maritima*), and Caribbean halophila (*Halophila baillonis*), (Pinellas County Department of Engineering and the Department of Environmental Management, August 1987). A seagrass sanctuary is located around Tarpon and Indian Keys.

Hundreds of brown pelicans and double-crested cormorants and dozens of herons, egrets, and roseate spoonbills nest within Tarpon and Little Bird Keys. Pinellas NWR provides important mangrove habitat for most long-legged wading species, especially for reddish egrets. The islands and shorelines are subject to erosion and invasion by exotic species, such as Brazilian pepper and Australian pine. All of the mangrove islands of Pinellas NWR are closed to public use year-round to protect the migratory birds (Kleen and Hunter, June 2006; Florida Department of Environmental Protection. (<http://www.dep.state.fl.us/coastal/sites/bocaciega-pinellas/info.htm>))

Passage Key NWR is now a meandering, slightly vegetated sand bar varying in size from less than 0.5 to 10 acres, depending on meteorologic and hydrologic conditions (U.S. Fish and Wildlife Service, <http://www.fws.gov/southeast/pubs/PassageFactSheet.pdf>; and U.S. Fish and Wildlife Service Tampa Bay Refuges "Visitor Services Review Report," March 2004). In 1970, Passage Key NWR was designated a Wilderness Area and because of its fragility and small size, it is now closed to all public use. The refuges' objectives are to provide habitat for colonial waterbirds. Hundreds of brown pelicans, laughing gulls, black skimmers, and royal terns nest annually. The small sand bar represents one of the last remaining nesting sites for laughing gulls, black skimmers, and royal terns in Tampa Bay. Passage Key NWR hosted the largest royal tern and sandwich tern nesting colonies in the State of Florida. Small numbers of herons and egrets also nested on the key. Passage Key NWR is closed to public use year-round to protect the migratory birds that use the island.

WILDLIFE

The Tampa Bay area contains more than 200 fish species, including popular species such as snook, redfish, and spotted sea trout. The Bay's mangrove-blanketed islands support the most diverse colonial waterbird nesting colonies in North America, annually hosting 40,000 pairs of 25 different species, ranging from the familiar white ibis and great blue heron to the reddish egret—the rarest heron in the nation. Tables 7 and 8 list protected animal and plant species and those species of special concern, respectively, in the Tampa Bay region (Florida Department of Environmental Protection, "Basin Status Report," November 2001).

Egmont Key NWR – More than 375 different species of birds have been reported in the Tampa Bay area. Bird checklists for Egmont Key NWR contain more than 110 species of birds (USGS Northern Prairie Wildlife Research Center, "Bird Checklists of the United States, Egmont Key State Park and National Wildlife Refuge" <http://www.npwrc.usgs.gov/resource/birds/chekbird/r4/egmont.htm>). Approximately 38,000 pairs of birds nested on Egmont NWR's beaches in 2007. In past years, instances of human disturbance have caused total failure of all nesting colonies.

In addition to numerous birds, presently, at least 12 reptiles and 4 amphibians are reported on Egmont Key NWR (U.S. Geological Survey, "National Treasures: The Box Turtles of Egmont Key," http://cars.er.usgs.gov/Education/Egmont_for_PDF.pdf). Tables 9 and 10 are listings of birds, amphibians, reptiles, fish and mammals observed on the refuge. Several of these species are non-resident, no longer present, or present on the refuge for only a part of their life cycle. Formerly, there were deer, raccoons, marsh rabbits, rats, and eastern diamondback rattlesnakes on the refuge, but there are no plans to return these species to the refuge. Atlantic loggerhead turtles nest on the island;

and large populations of box turtles are resident on the island (due to lack of predators and an abundance of cockroaches as a food source). In addition, gopher tortoises are abundant and conspicuous on Egmont Key NWR. Egmont Key NWR has the highest-density populations of gopher tortoises in the state. Observations of black racers and mole skinks suggest behavioral and physiological distinctions that indicate these populations developed in isolation from mainland species, and consequently they are regarded as special natural features of Egmont Key NWR. Several species of wildlife have been reported from the island in the past, yet recent documentation is lacking. Species requiring verification include marsh rabbits, native and/or exotic mice, diamondback terrapins, raccoons, and bats. Three species of lizards exist as museum records but have not been recently observed. The presence of feral cats on the island may have contributed to the apparent elimination of several small vertebrate species (Florida Division of Recreation and Parks, February 1998).

Surveys of the flora and fauna of Egmont Key NWR were conducted in 1990. From this and other studies, a list of "designated species" was compiled for Egmont Key NWR. This list of designated species consists of the following (Florida Division of Recreation and Parks, February 1998) (Note: Designated species are those which are listed by the Florida Natural Areas Inventory, U.S. Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, and the Florida Department of Agriculture and Consumer Services as endangered, threatened, or of special concern. Designated species also include those which are under review for inclusion in one of the above categories and those species which are regulated by the Convention on International Trade in Endangered Species (CITES):

- two plant species - Hairy beach sunflower (*Helianthus debilis* ssp. *vestitus*), and Shell mound prickly-pear cactus (*Opuntia stricta*);
- one fish - Common snook;
- three reptiles - Atlantic loggerhead turtle, Atlantic green turtle, and Gopher tortoise;
- seven birds - Brown pelican, Snowy egret, Reddish egret, Wood stork, Bald eagle, American oystercatcher, and Least tern; and
- one mammal - West Indian manatee.

The State of Florida lists six plant species on Egmont Key NWR as threatened (T) or endangered (E): Inkberry (*Scaevola plumieri*)-T, and Prickly pear cactus (*Opuntia stricta*)-T. A seventh species, the Hairy beach sunflower (*Helianthus debilis* ssp. *vestitus*), is proposed for listing (Kleen and Hunter, USFWS, June 2006). Live oaks (*Quercus virginiana* and/or *Q. geminata*) are now absent, but were apparently present on the island in the last century (Florida Department of Environmental Protection, November 1996).

Tables 7 and 8 list plants and animals which are classified as protected or species of special concern in the Tampa Bay area. Those species shown in blue have been observed at Egmont Key NWR. A complete listing of the plants found on Egmont Key NWR is given in "*Egmont Key Unit Management Plan (Review Draft)*", Division of Recreation and Parks, Department of Environmental Protection, State of Florida, February 13, 1998; of which 14 species are thought to be exotic.

In 2007, 550 pairs of black skimmers nested on Egmont Key NWR, the greatest number to date, due to beach renourishment and nest protection by law enforcement personnel and volunteers. Poor success in the past has been caused by beach erosion and disturbance by humans. Annually, 2,500-5,000 pairs of royal and sandwich terns nest on Egmont Key NWR. Adult and recently fledged royal and sandwich terns regularly rest and feed on the island.

About 240 pairs of piping plovers reside in the Tampa Bay area. The island is listed as critical habitat for endangered piping plovers; however, they are viewed infrequently on Egmont Key NWR, usually in the fall or early winter. Least tern populations have been declining and they have been nesting

only sporadically on Egmont Key NWR, with 135 pairs recorded in 2007. The Tampa Bay area has a population of 100-125 pairs of American oystercatchers. Two to four of these pairs nest on Egmont Key NWR annually. A few pairs (less than 30) of snowy plovers are nesting in the Tampa Bay area. Currently, none are nesting on Egmont, but they have been observed feeding and resting on the island. More recently, 10-200 pairs of white ibis nested on Egmont Key NWR from 2004 to 2008.

A discussion of the concerns for nesting waterbirds and shorebirds and transient and wintering shorebirds on Egmont Key NWR is included with the Passage Key NWR discussion below. Likewise, a discussion of the transient nearctic-neotropical migratory species breeding and migrating through, or wintering on Egmont Key NWR, is included in the Pinellas NWR discussion below.

Pinellas NWR was established as a breeding ground for colonial bird species. Species nesting in the refuge include brown pelicans, herons, egrets, and cormorants. Pinellas NWR hosted the largest brown pelican rookery in the state. Animal and plant species in the Tampa Bay area, which are protected or of special concern, are shown in Tables 7 and 8. The FWC has listed animals which are rare, endangered, or species of special concern for the Boca Ciega Bay and Pinellas County Aquatic Preserves, in which Pinellas NWR is located. These are shown in Table 11 (Florida Department of Environmental Protection, <http://www.dep.state.fl.us/coastal/sites/bocaciega-pinellas/info.htm>).

The bird species nesting on Pinellas NWR do so mostly in mangrove woodlands, today mostly on Little Bird Key. Formerly, nesting occurred widely on other keys, especially on Tarpon and Whale Keys, but do so today at greatly reduced levels. Tarpon Key, one of the islands within Pinellas NWR, was a significant nesting, resting, and feeding area for a variety of colonial nesting waterbirds, including white ibis, reddish egrets, and roseate spoonbills. Very little nesting has been documented in the last few years, when predator control efforts ceased and this colony succumbed to the predation of raccoons and possibly fish crows.

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicated the following species nesting in Tampa Bay should be considered as in need of conservation attention in refuge planning. The mangrove nesting and roosting waterbirds of specific conservation concern in the Pinellas NWR are (Kleen and Hunter, USFWS, June 2006):

Mangrove nesting and roosting waterbirds

Critical Recovery

Wood Stork

Immediate Management

Reddish Egret

Roseate Spoonbill

Conservation Stewardship

Double-crested Cormorant

Snowy Egret

Other species

Cattle Egret

Black-crowned Night-Heron

Management Attention

Brown Pelican

Tricolored Heron

White Ibis

Glossy Ibis

Little Blue Heron

Great Egret

Anhinga

Great Blue Heron

Green Heron

Yellow-crowned Night-Heron

Regionally, the reddish egret is the highest priority species among long-legged waders found nesting in Tampa Bay. They have not increased overall since the stoppage of the millinery trade. The Tampa Bay area supports the northernmost breeding population along Florida's Gulf Coast and includes at present between 60 and 85 pairs. This population has stabilized in the last few years.

The federally endangered wood stork is not nesting on any refuge lands in the Tampa Bay area, but it does nest in Tampa Bay. The tricolored heron is of increasing concern regionally and in Florida. Because this species is most numerous in coastal habitats, the Tampa Bay Refuges provide significant potential for foraging and nesting habitat.

Roseate spoonbill regionally appear to be doing well, but there is concern for the species in Peninsular Florida (especially south Florida). Tampa Bay populations may be important as the northernmost breeding population along Florida's Gulf coast.

Brown pelicans seem to be doing well elsewhere in the southeast, with the exception of some areas in Florida and South Carolina. Florida populations are apparently undergoing declines. Brown pelicans are susceptible to entanglement in monofilament line. Pelicans may be attempting to gather monofilament as fine material for nests, thus either getting entangled, or distributing monofilament throughout nesting areas.

White ibis are also of some regional concern, but while the species does breed in Tampa Bay, none are presently nesting on Pinellas NWR proper. This is a wandering species where numbers can fluctuate greatly locally, depending on water conditions throughout the state/region. This area can provide important nesting sites when conditions inland are poor. For example, in 2003, 18,000 pairs nested in Tampa Bay due to poor conditions at historical colonies in the Everglades. More recently, white ibis actually nested on Egmont Key NWR in 2004, for the first time known to the present refuge staff (i.e., during the last 18 years) and again from 2006-2008.

Yellow-crowned night herons nest at edges and are vulnerable to fish crows. They are crustacean specialists and have limited foraging areas. Black-crowned night herons are more widespread and not of much concern overall, but colonies do not exist in the thousands like they used to. Both species have nested on Tarpon and Little Bird Keys, Pinellas NWR.

Although not breeding in Tampa Bay, the keys in Pinellas NWR may represent important post-breeding roost sites for the magnificent frigatebird.

Mangroves also support a number of landbirds, principal among these are mangrove cuckoo, black-whiskered vireo, and Florida prairie warbler. Landbirds of conservation interest on the Tampa Bay Refuges include mangrove breeding species and transient nearctic-neotropical migratory species. The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicated the following species breeding, migrating through, or wintering in Tampa Bay (specifically Pinellas and Egmont Key NWRs) should be considered as in need of conservation attention in refuge planning ((Kleen and Hunter, USFWS, June 2006). (Note - there is very little active management intended for landbird habitat, other than exotic vegetation control where needed.)

Mangrove breeding species and transient Nearctic-Neotropical migratory species

Immediate Management

Prairie Warbler
Loggerhead Shrike
Painted Bunting

Conservation Stewardship

Gray kingbird
White-eyed Vireo
Sedge Wren
Cape May
Black-throated Blue Warbler
Connecticut Warbler
Bobolink

Other species

Peregrine Falcon

Management Attention

Mangrove Cuckoo
Black-whiskered Vireo
Common Ground-Dove
Eastern Towhee
Common Nighthawk
Chuck-will's-widow
Eastern Meadowlark
Northern Flicker
Northern Harrier
Purple Martin
Vesper Sparrow

Passage Key NWR was originally a mangrove island with a freshwater lake, but over the past 100 years, this island refuge has been reduced from 36 acres to a meandering sandbar of .5-10 acres due to the effects of high tides, tropical storms, and hurricanes. Since this refuge is designated wilderness, any attempts to restore it through beach re-nourishment require additional considerations on impacts to wilderness character (Kleen and Hunter, USFWS, June 2006).

Passage Key NWR was the most important colony for both royal terns and sandwich terns in the State of Florida at one time. Approximately 1,000-2,000 birds, including brown pelicans, laughing gulls, royal terns, and black skimmers, nested on Passage Key NWR. Among nesting shorebirds, plovers and oystercatchers are the highest priority species, but presently only the American oystercatcher is known to nest here. Wilson's plovers are not nesting on Passage Key NWR, but the potential exists. Snowy plovers also are not nesting here, but do occur elsewhere in Tampa Bay.

Among the colonial nesting species, black skimmers and least terns are the highest priority species nesting on Passage Key NWR and was the most secure nesting site in Tampa Bay. This island is closed to the public year-round to protect nesting, resting, and migrating birds, but illegal access by the public continues to cause birds to abandon their nests.

Large and important colonies of brown pelicans, laughing gulls, and royal and sandwich terns occurred on Passage Key NWR. However, human disturbance of nesting shorebirds and depredation by fish crows have resulted in poor reproductive success. Currently, no nesting is occurring since the island is submerged at high tide.

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates the following beach nesting waterbird and shorebird species in Tampa Bay (viz. Passage Key and Egmont Key NWRs) should be considered as in need of conservation attention in refuge planning (Kleen and Hunter, USFWS, June 2006):

Beach nesting waterbird and shorebird species

Critical Recovery

Snowy Plover

Conservation Stewardship

Willet

Royal Tern

Other species

Black-necked Stilt

Caspian Tern

Management Attention

Wilson's Plover

American Oystercatcher

Brown Pelican

Least Tern

Sandwich Tern

Laughing Gull

Gull-billed Tern

Black Skimmer

Passage Key and Egmont Key NWRs also provide important foraging and roosting habitat for transient and wintering shorebirds. The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates that the following migrating or wintering species in Tampa Bay should be considered as in need of conservation attention in refuge planning (Kleen and Hunter, USFWS, June 2006):

Transient and wintering shorebirds

Critical Recovery

Piping plover

Long-billed Curlew

Conservation Stewardship

Willet

Black-bellied Plover

Semipalmated Plover

Management Attention

Marbled Godwit

Semipalmated Sandpiper

Short-billed Dowitcher

Least Sandpiper

Stilt Sandpiper

Red Knot

Sanderling

Western Sandpiper

Dunlin

Whimbrel

Ruddy Turnstone

Table 7. Protected animal and plant species in the Tampa Bay Basin

Scientific Name*	Common Name	Federal Protection Status	State Protection Status	FNAI Global Rank	FNAI State Rank
AMPHIBIANS AND REPTILES					
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	LS	G5	S4
<i>Caretta caretta</i>	Loggerhead turtle	LT	LT	G3	S3
<i>Chelonia mydas</i>	Green turtle	LE	LE	G3	S2
<i>Drymarchon corais couperi</i>	Eastern indigo snake	LT	LT	G4T3	S3
<i>Eretmochelys imbricata</i>	Hawksbill turtle	LE	LE	G3	S1
<i>Gopherus polyphemus</i>	Gopher tortoise	N	LS	G3	S3
<i>Lepidochelys kempii</i>	Kemp's Ridley turtle	LE	LE	G1	S1
BIRDS					
<i>Ajaia ajaja</i>	Roseate spoonbill	N	LS	G5	S2 S3
<i>Aramus guaranauna</i>	Limpkin	N	LS	G5	S3
<i>Charadrius melodus</i>	Piping plover	LT	LT	G3	S2
<i>Egretta caerulea</i>	Little blue heron	N	LS	G5	S4
<i>Egretta rufescens</i>	Reddish egret	N	LS	G4	S2
<i>Egretta thula</i>	Snowy egret	N	LS	G5	S4
<i>Egretta tricolor</i>	Tricolored heron	N	LS	G5	S4
<i>Eudocimus albus</i>	White ibis	N	LS	G5	S4
<i>Haliaeetus leucocephalus**</i>	Bald eagle	LT	LT	G4	S3
<i>Grus Canadensis pratensis</i>	Florida sandhill crane	N	LT	G5T2T3	S2 S3
<i>Haematopus palliatus</i>	American oystercatcher	N	LS	G5	S3
<i>Mycteria americana</i>	Wood stork	LE	LE	G4	S2
<i>Pelecanus occidentalis</i>	Brown pelican	N	LS	G4	S3
<i>Rynchops niger</i>	Black skimmer	N	LS	G5	S3
<i>Sterna antillarum</i>	Least tern	N	LT	G4	S3
MAMMALS					
<i>Podomys floridanus</i>	Florida mouse	N	LS	G3	S3
<i>Sciurus niger shermani</i>	Sherman's fox squirrel	N	LS	G5T2	S2
<i>Trichechus manatus</i>	Manatee	LE	LE	G2	S2
PLANTS					
<i>Asclepias curtissii</i>	Curtiss' milkweed	N	LE	G3	S3
<i>Bigelovia nuttalli</i>	Nuttall's rayless goldenrod	N	LE	G3g4	S1
<i>Chrysopsis floridana</i>	Florida golden aster	LE	LE	G1	S1
<i>Glandularia tampensis</i>	Tampa vervain	N	LE	G1	S1
<i>Gossypium hirsutum</i>	Wild cotton	N	LE	G4G5	S3
<i>Opuntia stricta</i>	Prickly pear cactus		T		
<i>Scaevola plumieri</i>	Inkberry		T		
<i>Pteroglossaspis ecristata</i>	Giant orchid	N	LT	G2	S2

* Species listed in boldface type use or live in freshwater, saltwater, and/or wetland communities.

** Proposed for federal delisting because of the species' recovery.

Species shown in blue have been observed at Egmont Key.

Note: The Federal Protection Status column indicates the official federal endangerment status or level of legal protection, under the U.S. Endangered Species Act Classification, for the plant or animal species, subspecies, or variety as proposed or determined by the U.S. Fish and Wildlife Service or the National Oceanic and Atmospheric Administration (marine species). The classifications are as follows:

LE = Listed as Endangered.

LT = Listed as Threatened.

T(S/A) = Threatened due to similarity of appearance.

N = Not currently listed, nor currently being considered for listing.

The State Protection Status column shows the official state endangerment status or level of legal protection, as follows:

Animals listed by Florida Fish and Wildlife Conservation Commission:

LE = Listed as Endangered.

LT = Listed as Threatened.

LS = Listed as Species of Special Concern.

N = Not currently listed, nor currently being considered for listing.

Plants listed by Florida Department of Agriculture and Consumer Services (FDACS):

LE = Listed as Endangered.

LT = Listed as Threatened.

N = Not currently listed, nor currently being considered for listing.

Table 8. Nonlisted animal and plant species of special concern in the Tampa Bay Basin

Scientific Name*	Common Name	FNAI Global Rank	FNAI State Rank
FISH			
Microphis brachyurus	Opossum pipefish	G4G5	S2
AMPHIBIANS AND REPTILES			
Crotalus adamanteus	Eastern diamondback rattlesnake	G4	S3
BIRDS			
Casmerodius albus	Great egret	G5	S4
Ixobrychus exilis	Least bittern	G5	S4
Nycticorax nycticorax	Black-crowned night-heron	G5	S3
Nyctanassa violacea	Yellow-crowned night-heron	G5	S3
Plegadis falcinellus	Glossy ibis	G5	S2
Rallus longirostris scottii	Florida clapper rail	G5T3	S2
Sterna caspia	Caspian tern	G5	S2
Sterna maxima	Royal tern	G5	S3
Sterna sandvicensis	Sandwich tern	G5	S2
PLANTS			
Helianthus debilis spp. vestitus	Hairy beach sunflower	G5T2	S2
Rhynchospora culixa	Georgia beakrush	G1	SH

* Species listed in boldface type use or live in freshwater, saltwater, and/or wetland communities.

Species shown in blue have been observed at Egmont Key.

Note:

The Florida Natural Areas Inventory Global Rank characterizes relative rarity or endangerment worldwide, with G1 being critically imperiled globally because of extreme rarity or because of extreme vulnerability to extinction, and G5 being demonstrably secure globally. Similarly, the State Rank of S1 through S5 characterizes relative rarity or endangerment in Florida. The rankings are based on many factors, the most important being the estimated number of occurrences, estimated abundance (number of individuals), range, estimated adequately protected occurrences, relative threat of destruction, and ecological fragility.

Sources:

Florida Fish and Wildlife Conservation Commission. 2006. Florida's Endangered Species, Threatened Species, and Species of Special Concern, Official Lists. Tallahassee, Florida. Available at <http://myfwc.com/imperiledspecies/pdf/Threatened-and-Endangered-Species-2006.pdf>

Marois, Katherine C. June 1999. Tracking List of Rare, Threatened, and Endangered Plants and Animals and Natural Communities of Florida. Tallahassee, Florida: Florida Natural Areas Inventory.

Ashton, Ray E., Ed. 1992. Rare and Endangered Biota of Florida. Gainesville, Florida: University Press of Florida.

Wunderlin, Richard P. 1998. Guide to the Vascular Plants of Florida. Gainesville, Florida: University Press of Florida.

Table 9. Birds observed at Egmont Key NWR

<u>Common Name</u>	<u>Scientific Name</u>
Mottled Duck	<i>Anas fulvigula</i>
Blue-winged Teal	<i>Anas discors</i>
Ring-necked Duck	<i>Aythya collaris</i>
Lesser Scaup	<i>Aythya affinis</i>
Red-breasted Merganser	<i>Mergus serrator</i>
Common Loon	<i>Gavia immer</i>
Horned Grebe	<i>Podiceps auritus</i>
Northern Gannet	<i>Morus bassanus</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Brown Pelican	<i>Pelecanus occidentalis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Anhinga	<i>Anhinga anhinga</i>
Magnificent Frigatebird	<i>Fregata magnificens</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Casmerodius albus</i>
Snowy Egret	<i>Egretta thula</i>
Little Blue Heron	<i>Egretta caerulea</i>
Tricolored Heron	<i>Egretta tricolor</i>
Reddish Egret	<i>Egretta rufescens</i>
Cattle Egret (e)	<i>Bubulcus ibis</i>
Green Heron	<i>Butorides striatus</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>
White Ibis	<i>Eudocimus albus</i>
Glossy Ibis	<i>Plegadis falcinellus</i>
Roseate Spoonbill	<i>Ajaia ajaja</i>
Wood Stork	<i>Mycteria americana</i>
Black Vulture	<i>Coragyps atratus</i>
Turkey Vulture	<i>Cathartes aura</i>

Table 9 (cont.)

Birds observed at Egmont Key NWR

<u>Common Name</u>	<u>Scientific Name</u>
Osprey	<i>Pandion haliaetus</i>
Swallow-tailed Kite	<i>Elanoides forficatus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Northern Harrier	<i>Circus cyaneus</i>
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Purple Gallinule	<i>Porphyryla martinica</i>
Common Moorhen	<i>Gallinula chloropus</i>
Black-bellied Plover	<i>Pluvialis squatarola</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>
Piping Plover	<i>Charadrius melodus</i>
Wilson's Plover	<i>Charadrius wilsonia</i>
Killdeer	<i>Charadrius vociferus</i>
Snowy Plover	<i>Charadrius alexandrinus</i>
American Oystercatcher	<i>Haematopus palliatus</i>
Black-necked Stilt	<i>Himantopus mexicanus</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Whimbrel	<i>Numenius phaeopus</i>
Long-billed Curlew	<i>Numenius americanus</i>
Marbled Godwit	<i>Limosa fedoa</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Red Knot	<i>Calidris canutus</i>
Sanderling	<i>Calidris alba</i>
Western Sandpiper	<i>Calidris mauri</i>
Least Sandpiper	<i>Calidris minutilla</i>
Dunlin	<i>Calidris alpina</i>
Stilt Sandpiper	<i>Calidris himantopus</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>
Short-billed Dowitcher	<i>Limnodromus griseus</i>
Laughing Gull	<i>Larus atricilla</i>
Ring-billed Gull	<i>Larus delawarensis</i>

Table 9 (cont.)
Birds observed at Egmont Key NWR

<u>Common Name</u>	<u>Scientific Name</u>
Herring Gull	<i>Larus argentatus</i>
Great Black-backed Gull	<i>Larus marinus</i>
Least Tern	<i>Sterna antillarum</i>
Gull-billed Tern	<i>Sterna nilotica</i>
Forster's Tern	<i>Sterna forsteri</i>
Royal Tern	<i>Sterna maxima</i>
Sandwich Tern	<i>Sterna sandvicensis</i>
Black Skimmer	<i>Rynchops niger</i>
Caspian Tern	<i>Sterna caspia</i>
Common Tern	<i>Sterna hirundo</i>
Rock Dove (Pigeon) (e)	<i>Columba livia</i>
Mourning Dove	<i>Zenaida macroura</i>
Common Ground-Dove	<i>Columbina passerina</i>
Mangrove Cuckoo	<i>Coccyzus minor</i>
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
Barn Owl	<i>Tyto alba</i>
Eastern Screech-Owl	<i>Otus asio</i>
Common Nighthawk	<i>Chordeiles minor</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>
Belted Kingfisher	<i>Ceryle alcyon</i>
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>
Northern Flicker	<i>Colaptes auratus</i>
Eastern Wood-Pewee	<i>Contopus virens</i>
Acadian Flycatcher	<i>Empidonax virescens</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Gray Kingbird	<i>Tyrannus dominicensis</i>
White-eyed Vireo	<i>Vireo griseus</i>
Black-whiskered Vireo	<i>Vireo altiloquus</i>
American Crow	<i>Corvus brachyrhynchos</i>
Fish Crow	<i>Corvus ossifragus</i>

Table 9 (cont.)
Birds observed at Egmont Key NWR

<u>Common Name</u>	<u>Scientific Name</u>
Carolina Wren	<i>Thryothorus ludovicianus</i>
Sedge Wren	<i>Cistothorus platensis</i>
Barn Swallow	<i>Hirundo rustica</i>
Purple Martin	<i>Progne subis</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>
American Robin	<i>Turdus migratorius</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Brown Thrasher	<i>Toxostoma rufum</i>
European Starling (e)	<i>Sturnus vulgaris</i>
Northern Parula Warbler	<i>Parula americana</i>
Magnolia Warbler	<i>Dendroica magnolia</i>
Cape May Warbler	<i>Dendroica tigrina</i>
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Yellow-rumped Warbler	<i>Dendroica coronata</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Prairie Warbler	<i>Dendroica discolor</i>
Palm Warbler	<i>Dendroica palmarum</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Hooded Warbler	<i>Wilsonia citrina</i>
Blackburnian Warbler	<i>Dendroica fusca</i>
Blackpoll Warbler	<i>Dendroica striata</i>
American Redstart	<i>Setophaga ruticilla</i>
Prothonotary Warbler	<i>Protonotaria citrea</i>
Connecticut Warbler	<i>Oporornis agilis</i>
Scarlet Tanager	<i>Piranga olivacea</i>
Rufous-sided (Eastern) Towhee	<i>Pipilo erythrophthalmus</i>
Vesper Sparrow	<i>Pooecetes gramineus</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Indigo Bunting	<i>Passerina cyanea</i>

Table 9 (cont.)
Birds observed at Egmont Key NWR

<u>Common Name</u>	<u>Scientific Name</u>
Painted Bunting	<i>Passerina ciris</i>
Blue Grosbeak	<i>Guiraca caerulea</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Boat-tailed Grackle	<i>Quiscalus major</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Common Grackle	<i>Quiscalus quiscula</i>
House Sparrow (e)	<i>Passer domesticus</i>

(e) – exotic, non-native

Sources:

"Egmont Key Unit Management Plan (Review Draft)," Division of Recreation and Parks, Department of Environmental Protection, State of Florida, Feb 1998.

"Bird Checklists Of The United States, Egmont Key State Park And National Wildlife Refuge," Northern Prairie Wildlife Research Center, USGS, <http://www.npwrc.usgs.gov/resource/birds/chekbird/r4/egmont.htm>

"Official State List Of The Birds Of Florida," Florida Ornithological Society Records Committee, <http://www.fosbirds.org/recordcommittee/statelistfebruary2005.htm>

"Tampa Bay Refuges, St. Petersburg, FL – Egmont Key Refuge, Pinellas Refuge, Passage Key Refuge," (draft) Biological Review Report, by J. Kleen and C. Hunter, U.S. Fish and Wildlife Service, June 2006.

Table 10. Amphibians, reptiles, fish and mammals observed at Tampa Bay Refuges

FROGS AND TOADS

<u>Common Name</u>	<u>Scientific Name</u>
Eastern Narrow-mouthed Toad	<i>Gastrophryne carolinensis</i>
Squirrel Treefrog	<i>Hyla squirella</i>

SNAKES

<u>Common Name</u>	<u>Scientific Name</u>
Southern Black Racer	<i>Coluber constrictor priapus</i>
Eastern Diamondback	<i>Crotalus adamanteus</i>
Corn Snake	<i>Elaphe guttata guttata</i>
Yellow Rat Snake	<i>Elaphe obsoleta quadrivittata</i>
Eastern Kingsnake	<i>Lampropeltis getula getula</i>
Florida Kingsnake	<i>Lampropeltis getula floridana</i>

LIZARDS

<u>Common Name</u>	<u>Scientific Name</u>
Green Anole	<i>Anolis carolinensis</i>
Brown Anole (e)	<i>Anolis sagrei</i>
Six-lined Racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>
Mole Skink	<i>Eumeces egregius</i>
Southeastern Five-lined Skink	<i>Eumeces inexpectatus</i>

TURTLES

<u>Common Name</u>	<u>Scientific Name</u>
Atlantic Loggerhead	<i>Caretta caretta</i>
Gopher Tortoise	<i>Gopherus polyphemus</i>
Florida Box Turtle	<i>Terrepene carolina bauri</i>
Atlantic Green Turtle	<i>Chelonia mydas mydas</i>

FISH

<u>Common Name</u>	<u>Scientific Name</u>
Speckled Worm Eel	<i>Myrophis punctatus</i>
Spotted Seatrout	<i>Cynoscion nebulosus</i>
Spotted Moray	<i>Gymnothorax moringa</i>
Tarpon	<i>Megalops atlanticus</i>
Common Snook	<i>Centropomus undecimalis</i>
Mosquitofish	<i>Gambusia</i> sp.
Striped Mullet	<i>Mugil cephalus</i>

**Table 10 (cont.)
Amphibians, reptiles, fish and mammals
observed at the Tampa Bay Refuges**

Redfish	<i>Sciaenops ocellatus</i>
Barracuda	<i>Sphyraena barracuda</i>
Atlantic Spadefish	<i>Chaetodipterus faber</i>
Blacktip Shark	<i>Carcharhinus limbatus</i>
Bonnethead Shark	<i>Sphyrna tiburo</i>
Bull Shark	<i>Carcharhinus leucas</i>
Burrfish	<i>Chilomycterus</i> sp.
Pigmy File Fish	<i>Monacanthus setifer</i>
Florida Pompano	<i>Trachinotus carolinus</i>
Gafftopsail Catfish	<i>Bagre marinus</i>
Nassau Grouper	<i>Epinephelus striatus</i>
Nurse Shark	<i>Ginglymostoma cirratum</i>
Pinfish	<i>Lagodon rhomboides</i>
Scrawled Cowfish	<i>Lactophrys quadricornis</i>
Sharksucker	<i>Echeneis naucrates</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Gray Snapper	<i>Lutjanus griseus</i>

MAMMALS

<u>Common Name</u>	<u>Scientific Name</u>
Common pilot whale	<i>Globicephala melaena</i>
Short-finned pilot whale	<i>Glogicephala macrorhynchus</i>
Bottle-nosed dolphin	<i>Tursiops truncatus</i>
Risso's dolphin	<i>Grampus griseus</i>
West Indian manatee	<i>Manatus trichechus latirostris</i>
Feral cat (e)	<i>Felis domesticus</i>
Roof rat (e)	<i>Rattus rattus</i>

(e) – exotic, non-native

Sources:

"Egmont Key Unit Management Plan (Review Draft)," Division of Recreation and Parks, Department of Environmental Protection, State of Florida, February 13, 1998.

"Fish Checklists of the United States Egmont Key State Park and National Wildlife Refuge," Northern Prairie Wildlife Research Center, USGS, <http://www.npwr.usgs.gov/resource/birds/chekbird/r4/fislist.htm>

"Amphibian and Reptile Checklists of the United States, Egmont Key State Park and National Wildlife Refuge," Northern Prairie Wildlife Research Center, USGS, <http://www.npwr.usgs.gov/resource/birds/chekbird/r4/egmamp.htm>

Table 11. Rare, endangered, and species of special concern at the Tampa Bay Refuges

Common Name	Scientific Name	State	Federal
Reptiles			
American alligator	<i>Alligator mississippiensis</i>	SSC	T (s/a)
Atlantic loggerhead	<i>Caretta caretta</i>	T	T
Green sea turtle	<i>Chelonia mydas</i>	E	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Birds			
roseate spoonbill	<i>Ajaia ajaja</i>	SSC	n/a
little blue heron	<i>Egretta caerulea</i>	SSC	n/a
snowy egret	<i>Egretta thula</i>	SSC	n/a
tricolor heron	<i>Egretta tricolor</i>	SSC	n/a
bald eagle	<i>Haliaeetus leucocephalus</i>	T	T
wood stork	<i>Mycteria Americana</i>	E	E
brown pelican	<i>Pelecanus occidentalis</i>	SSC	n/a
Mammals			
Florida manatee	<i>Trichechus manatus latirostris</i>	E	E

State listings are taken from the Florida Fish and Wildlife Conservation Commission. Federal listings are taken from the United States Fish and Wildlife Service. E= Endangered; T= Threatened; T (s/a)= Threatened due to similarity in appearance; SSC= Species of Special Concern; n/a= information not available or no designation listed

Source: Tampa Bay Aquatic Preserves Information Page, Florida Department of Environmental Protection, <http://www.dep.state.fl.us/coastal/sites/bocaciega-pinellas/info.htm>

CULTURAL RESOURCES

The vast majority of cultural resource information available for the Tampa Bay Refuges focuses on Egmont Key NWR. Cultural resource information is essentially nil for Passage Key NWR. Hurricanes and erosion have reduced the 60-acre island with a freshwater lake and lush vegetation to its present state of less than a 5-acre shallow, sandy shoal. (See Section A, Chapter II, Refuge Overview.) Cultural resource information is unknown (and most likely nonexistent) for the islands comprising the Pinellas NWR due to their nature as low-lying mangrove islands. Passage Key NWR was an important navigational landmark for early Spanish and British sailors. The island was first identified on nautical charts as “Isla de San Francisco y Leon,” then “Burnaby Island,” and later “Cayo del Pasaje,” or Passage Key.

Archaeological

An archaeological survey (for aboriginal resources) was conducted on Egmont Key NWR in the 1970s (Florida Department of Environmental Protection, November 1996; Grange 1977). Although no sites were recorded, pre-Columbian use/occupancy of the island by Native Americans may have occurred. A pottery shard was found and authenticated by Walt Marder, Florida’s Department of Historical Resources, to be the same type that was manufactured for 2,000 years until the first contact with Europeans (Florida Department of Environmental Protection, February 1998). The primary cultural resources on Egmont Key NWR are the lighthouse (8 HI 117A) and the resources of the Fort Dade sites (8 HI 117), shown in Figure 17. The following is a quotation taken from “Resource Management Audit, Egmont Key,” by the Florida Division of Recreation and Parks, District 4, November 4, 1996:

"The cultural resources of Egmont Key are the derelict remains of an abandoned U.S. Army post (Fort Dade). Most structures were built for limited life spans, due in part to the Army's understandings of changing ordnance technologies and defensive philosophies of the period from 1898 through 1945. Support structures, such as workshops and garages, were built to be short-lived. Indeed, none exists as more than a floor. The historical structures on the island have been variously impacted by shoreline erosion, arson fires, vandalism, and the passage of time. While the lighthouse is in good condition, meaning it is structurally sound, it is not in pristine condition—the cupola is missing, railings are rusted, etc. The conditions of the concrete or masonry structures associated with Fort Dade range from fair (batteries Mellon and McIntosh) to poor (those that have lost structural integrity (batteries Page and Burchsted; now rubble in the Gulf of Mexico). Unless the erosion of the island is halted, structures including the remaining batteries and possibly the icehouse/dining hall are also likely to be lost in the next few years. Battery Howard suffered significant damage within the last year and during a storm event, and batteries Mellon and McIntosh could be seriously impacted during a significant storm. Storms surge into the power plant/dining hall (only ~60 feet from surf); vandals are literally knocking holes through the walls. Sections of an extensive brick road system are in fair-good condition, although previous managing agencies are said to have mined the roadway for brick in the past. The storm water drainage system associated with the roads and other semi-permanent elements of Fort Dade are clogged. Some are partially collapsed. Wood-frame structures associated with the Fort lost structural integrity long ago."

Figure 17. Cultural Resources of Egmont Key NWR



Historical

The following discussion is largely taken from "Egmont Key Unit Management Plan (Review Draft)," by the Florida Division of Recreation and Parks, February 1998:

Situated at the mouth of Tampa Bay, Egmont Key has long been recognized for its strategic military location. Egmont Key may have been first visited in 1757 by Francisco Maria Celi, pilot of the Spanish Fleet, who named it "Isla de San Blas y Barreda". At that time, Celi reported finding a canoe on the island. This may be the only historical evidence that Indians visited the site. Since there is no freshwater source, and travel to the island entailed crossing open, often rough water, it is likely that Egmont Key was only used periodically by Indians for hunting, crabbing, and shellfishing.

After the United States obtained control of Florida in 1821 with the signing of the Adams-Onis Treaty, several unsuccessful attempts were made at homesteading the island. Probably the same factors which discouraged the Indians from settling Egmont Key also made life very difficult for other would-be settlers.

In 1846, Congress authorized the construction of the Egmont Key lighthouse at the northern end of the island. It was completed in May 1848 and was partially destroyed by two hurricanes in September of that year. During the first hurricane in September of 1848, Marvel Edwards, Egmont Key's first lighthouse tender, placed his family in a boat during the hurricane and waded out to the highest point of the island in the center of the key where there were some large cabbage palms. Edwards tied the boat to the palms and during the night, rode out the violence of the storm, his bobbing craft rising with the high water almost to the top of the palms. By morning, though exhausted by the ordeal, the family had survived. Returning to the lighthouse, they found it badly damaged and all their possessions destroyed. When the keeper saw the damage to the lighthouse, he rowed off to Tampa and never returned. Tides 15 feet above normal washed over the island and damaged the light. Another storm in 1852 did additional damage and prompted Congress to appropriate funds to rebuild the lighthouse and lightkeeper's residence (Florida Division of Recreation and Parks, "Egmont Key State Park History," <http://www.floridastateparks.org/egmontkey/History.cfm>). A second lighthouse designed to "withstand any storm", was completed in 1858. The new tower was 87 feet high and was fitted with an Argand kerosene lamp and fixed Fresnel lens. The lighthouse, still in service today, is situated at latitude 27 degrees, 36 minutes, 4 seconds N and longitude 82 degrees, 45 minutes, 40 seconds W.

At the end of the third Seminole War in 1858, Egmont Key was used by the U.S. Army to detain Seminole prisoners until they could be transported to Arkansas Territory (Florida Division of Recreation and Parks, "Egmont Key State Park History," <http://www.floridastateparks.org/egmontkey/History.cfm>). One of the most dramatic scenes took place on Egmont Key in 1858 at the conclusion of the Billy Bowlegs War, the final Indian War in Florida. Billy Bowlegs was the last Seminole Indian chief remaining in South Florida. He surrendered with his weary band of 138 followers in Fort Myers on May 4, 1858. The tribesmen were transported to Egmont Key for their final Florida rendezvous before being shipped across the Gulf of Mexico to a reservation in Arkansas. One proud Seminole warrior - Tiger Tail - could not endure the humility of being taken from his native Florida. In the morning, the Indians were to leave Egmont Key, Tiger Tail ground up a quantity of finely ground glass and swallowed it with a glass of water. Tiger Tail's suicide tragically ended the era of Florida Indians (Florida Vacation and Travel Guide, "History of Anna Maria Island," <http://www.2fla.com/history.htm>).

In February 1849, Colonel Robert E. Lee visited the area and recommended that Egmont Key and neighboring Mullet Key be reserved by the government for military purposes. Before the Civil War the area was a haven for runaway slaves. At the onset of the Civil War, Confederate troops who had occupied Egmont Key removed the lighthouse's Fresnel lens to deny the Union Navy the use of the beacon. The island was captured by Union forces in 1861 and held until 1865 as the blockade headquarters for the Tampa Bay area, during which time it was also a military prison and a refuge for southern pro-Union sympathizers. From here Union troops sailed up the Manatee River and destroyed the sugar mills of the Gamble and Braden plantations (Florida Vacation and Travel Guide, "History of Anna Maria Island," <http://www.2fla.com/history.htm>). In 1864, the city of Tampa was captured by the Union troops, and an unsuccessful attempt was made to recover the Fresnel lens. The lens was returned at the end of the Civil War, and the lighthouse resumed normal operations in 1866. A cemetery for Union and Confederate soldiers was opened on the island in 1864. The cemetery was closed in 1909 and the bodies were moved to military cemeteries at other locations.

In 1898, the Spanish-American War broke out, and Fort Dade was established on Egmont Key with temporary gun batteries. Later, the actual construction of Fort Dade began and continued until 1916. During this time period, over 70 buildings were constructed, including a bakery, a movie theater, a post office, a morgue, a 13-bed hospital, a gymnasium with a bowling alley, a stable, a guardhouse, and a tennis court. In addition, brick streets were laid and five gun emplacements were constructed. The Spanish never attacked Florida and the guns were never fired in defense of the coast.

The hospital at Fort Dade was used to quarantine all American soldiers returning from Cuba for ten days. During World War I, Fort Dade was used as a training center for National Guard Coast Artillery Units. Fort Dade was deactivated in 1923, although the military still utilized the island for coastal submarine watch and aerial exercises in World War II. A summary of the Military history of Egmont Key was prepared by Roger T. Grange.

In 1928, the Tampa Bay Pilots Association (TBPA), which guides ships through Tampa Bay, was granted a 99-year lease to five acres on Egmont Key, to serve as their base of operations.

The U.S. Lighthouse Service was transferred in 1939 to the U.S. Coast Guard (USCG) which has maintained a light station on Egmont Key ever since. In the 1940s, the USCG replaced the existing lighthouse lens with a double aviation beacon. With the advent of radio communications, they also set up a radio direction finder (RDF), which is used extensively for air and sea navigation. This transmitter now serves as part of the Differential Global Positioning System (DGPS) and is used for surveying, research and transportation. Egmont Key was put to military use again during World War II, as a harbor patrol station and an ammunition storage facility.

In the 1970s, Egmont Key was recognized as valuable wildlife habitat for nesting shorebirds and sea turtles, and on July 10, 1974, it became a national wildlife refuge, managed by the U.S. Fish and Wildlife Service. In December 1978, Egmont Key was entered on the National Register of Historic Places.

In July 1990, the USCG replaced the lighthouse's double aviation beacon with a single beacon, which increased the light's range from 28 to 32 miles. Presently, it is one of the brightest lighthouses in Florida.

Due to staffing limitations and increased public visits, the Service was unable to protect the resources of the island on its own. The Florida Park Service began operations at Egmont Key NWR on October 1, 1989, as part of a co-management agreement with the Service.

SOCIOECONOMIC ENVIRONMENT

Regional Demographics and Economy

The Tampa Bay Refuges all lie within the Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (MSA). According to the 2005 American Community Survey (U.S. Census Bureau, 2005), the population of the Tampa-St. Petersburg-Clearwater MSA was almost 2.6 million – the largest metro area in Florida, and the second largest in the southeastern United States (Table 12). The population of the Tampa-St. Petersburg-Clearwater MSA has more than doubled since 1970, when the population was 1,105,553. In the last five years, the population of the MSA has increased by about 8.5 percent (Table 12). The Tampa Bay area, and Hillsborough County in particular, has a diverse mix of different cultures and it also has a large community of Latin Americans, the largest minority in the Tampa Bay region. The Tampa Bay region ranks second in the state in terms of homelessness (Tampa Bay Regional Planning Council, September 2005).

The per-capita income of the Tampa-St. Petersburg-Clearwater MSA is comparable with the national average. Given the growth, proximity, and the socio-economic pressures of the MSA, development impacts are likely to be felt on the Egmont Key NWR. (Because of their small size and importance as nesting and breeding grounds for brown pelicans and other water fowl, the public is not allowed entry to Pinellas and Passage Key NWRs.) Egmont Key NWR is the only island open to the public in Tampa Bay and has been traditionally visited for many years as a primary recreation destination (U.S. Fish and Wildlife Service, “Visitor Services Review Report (draft),” March 2004). In recent years, Egmont Key NWR has drawn approximately 130,000-170,000 visitors annually, with many of these being local citizens, bird watchers, beach combers, and school children. The MSA’s elementary and high school enrollment was estimated to be about 396,000 students in 2005.

The Tampa Bay area is a center for shipping, business, industry, and tourism. Three seaports now flourish along the bay’s borders, in Tampa, St. Petersburg, and in northern Manatee County. The largest of these, the Port of Tampa, consistently ranks among the busiest ports in the nation. Combined, the three ports contribute an estimated \$15 billion to the local economy and support 130,000 jobs (Tampa Bay Estuary Program, May 2006). The Port of Tampa handles nearly half of all seaborne commerce passing through the state (and almost as much cargo as all Florida’s other deepwater ports combined), and it is home to a rapidly growing cruise ship industry. The Tampa Port is the nation’s seventh largest port. Because it is the closest deepwater port to the Panama Canal, the port is home to a diverse traffic base with terminal facilities encompassing container, bulk, break bulk, ro-ro (role-on roll-off), and project cargoes. It is North America’s largest dockside cold storage terminal and home to numerous cruise lines. The Tampa Bay area’s main industries include citrus canning (it’s the citrus canning capitol of the world), shrimping, fabricated steel, electronic equipment, cigars, beer, paint, and fertilizers. More than 4 billion gallons of oil, fertilizer products, and other potentially hazardous materials pass through Tampa Bay each year.

Services and retail trade dominate the economy of the MSA. Tampa is not as heavily dependent on tourism as other major cities in Florida. The combination of shipping, tourism, a large retirement community, and a strong manufacturing base contributed to the Bay area’s insulation against adverse changes in the economy.

Outdoor Recreational Economics

The wildlife resources of the three Tampa Bay Refuges are economically important. In addition to the commercial and recreational fishing, ecotourism, including wildlife viewing and photography, and environmental interpretation are increasingly being seen as economically important to local businesses. As the population increases and the number of places left to enjoy wildlife decreases, the refuges may become even more important to the local community. It benefits the community directly by providing recreational and employment opportunities for the local population and indirectly by attracting tourists from outside the area to generate additional income to the local economy. Table 13 presents information summarizing the economic value of wildlife watching in Florida by United States' residents.

Table 12. Demographics of the Tampa Bay Region

Characteristic	Tampa St.Petersburg Clearwater MSA^b	Pinellas County	Hillsborough County	Pasco County	Manatee County	United States
<u>Demographic</u>						
Population (number)	2,596,556	905,158	1,111,717	423,356	300,828	288,378,137
Total Land Area (sq. miles)	2,554.0	280.0	1,051.0	745.0	741.0	3,537,438.0
Population Density (pop./sq. mile)	1,017	3,233	1,058	568	406	82
<u>Race/Ethnicity (% of Population)</u>						
White	81.4	84.1	74.1	91.8	84.1	74.4
Black/African American	11.1	9.9	16.0	2.9	8.2	12.1
Hispanic/Latino (of any race)	13.2	6.3	21.4	8.4	11.4	14.5
Asian	2.5	2.8	3.0	1.5	1.4	4.3
<u>Education (% of population over 25)</u>						
High School degree	85.5	87.3	84.1	85.8	85.1	84.2
College degree	24.5	26.2	27.2	17.7	26.0	27.2
<u>Economic</u>						
Median Household Income	\$ 41,852	\$ 40,694	\$ 45,129	\$ 39,562	\$ 44,414	\$ 46,242
Per capita Income	\$ 25,020	\$ 27,137	\$ 25,086	\$ 22,108	\$ 25,925	\$ 25,035
Families below poverty level (%)	9.3%	8.6%	10.2%	8.7%	6.7%	10.2%
Individuals below poverty level (%)	12.0%	11.1%	13.0%	11.3%	10.0%	13.3%

^a U.S. Department of Commerce, U.S. Census Bureau, 2005 American Community Survey

^b The Tampa-St.Petersburg-Clearwater Metropolitan Statistical Area (MSA) is comprised of four counties: Pinellas, Hillsborough, Pasco, and Hernando

Table 13. Activities in Florida by U.S. Residents

Wildlife Watching (observing, photographing, or feeding wildlife)

Total wildlife-watching participants	3,240,000
Nonresidential (away from home)	1,503,000
Residential (at home)..	2,635,000
Total expenditures	\$1,575,481,000
Trip-related	\$.675,384,000
Equipment and other	\$.900,097,000
Average per participant	\$.486
Trip and equipment expenditures by nonresidents in Florida	\$.401,128,000

Source:

“2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau, revised March 2003,
<http://www.census.gov/prod/www/abs/fishing.html>

Refuge Administration and Management

LAND PROTECTION AND CONSERVATION

Erosion is a significant issue for all three refuges in the Tampa Bay area. One of the objectives for the Egmont Key NWR is to conserve and protect the barrier island habitat and preserve historical structures of national significance that are located on the refuge. In 1877, Egmont Key was 539 acres. By 1969, the island was reduced to 405 acres, and in 1974, the year it was designated a national wildlife refuge, the island was 392 acres. Today, the island is approximately 240-250 acres. The result of this loss has been a serious degradation of the island’s natural areas and cultural resources. Beach habitat has been lost, and structures associated with Fort Dade have also been impacted—two of the gun batteries are now in the Gulf of Mexico and other structures (three other gun batteries and the icehouse/mess hall) are in danger of being lost in the near future. In 1999-2000, and again in 2006, the northwest beach area has been renourished as part of a project operated by the Corps.

The Pinellas NWR is made up of several mangrove islands and totals 394 acres. One of the objectives for Pinellas NWR is to conserve and protect the mangrove island habitat. Erosion on these islands is being addressed by vegetative plantings and placement of oyster domes and oyster shell bags along the shorelines by volunteers.

Passage Key NWR, when established, was a 60-acre mangrove island with a freshwater lake. A 1921 hurricane destroyed the island. Today, it is a 0.5 to 10-acre meandering island and submerged lands, and is managed as an intermittent island.

VISITOR SERVICES

Egmont Key NWR is the only island open to the public within the Tampa Bay Refuges. The island is accessed by boat and receives about 130,000 to 170,000 visitors annually. If not managed properly, increasing visitor use and non-related wildlife-dependent recreation brings increasing risks to fragile fish and wildlife resources and other natural, cultural, and historical resources associated with the refuges.

For the most part, none of the priority public uses are actively promoted by the Service at the Tampa Bay Refuges and their surrounding access sites (e.g., boat ramps and fishing piers). There are excellent opportunities for wildlife observation and photography, environmental education and interpretation, and outreach. Fishing is a primary public use off-shore, with the state and local governments providing primary enforcement oversight for the waterways.

The Tampa Bay Refuges currently do not have a Visitor Services Plan. Egmont Key NWR has beach access on the north section of the island and a small access area on the eastern side of the island, where visitors can observe and photograph the wildlife, particularly shorebirds. There is a small trail system and other areas on the northern portion of the island which provide other opportunities for wildlife observation, and one is almost certain to view a gopher tortoise among other wildlife species. Visitors can also view wildlife from boats at a more distant vantage at Passage Key and Pinellas NWRs. The Service currently provides no environmental education programs on the Tampa Bay Refuges. There are no interpretive panels related to the historic remains on the island and only a few related to the wildlife, and there is a limited outreach program.

There is some signage on the refuge islands, predominantly boundary signs identifying closed areas. On Egmont Key NWR, there are a couple of signs indicating the Service and Florida State Park management partnership, and a few directional signs posted by the park. Some of the Fort Dade building sites, remains, and the Guard House Building have identification signs posted; however, these signs are not consistent—some were posted by the state, others by the Service, and volunteers have posted their own signs, which are beginning to deteriorate. There is one restroom available at times to the public and no potable water available to the public.

PERSONNEL, OPERATIONS, AND MAINTENANCE

The Tampa Bay Refuges are administered by the Chassahowitzka NWR Complex in Crystal River, Florida. The 10-person staff is responsible for the Chassahowitzka and Tampa Bay Refuges. The staff includes the refuge manager, GS-485-13; deputy refuge manager, GS-485-11/12; office assistant, GS-303-07; wildlife biologist, GS-486-11; visitor services specialist, GS-025-09/11; (2) park rangers/law enforcement, GS-025-07/09; refuge operations specialist/law enforcement, GS-485-09/11; small craft operator, WG-5786-08; and maintenance mechanic, WG-4749-07/08.

Egmont Key NWR has been cooperatively managed with the Florida Park Service (FPS) through a Cooperative Agreement signed in 1989. Under the terms of this agreement, the FPS would manage public use activities and natural and cultural resources, and the Service would continue to manage the wildlife resources on the island and review FPS resource management and land use. There is one full-time state park manager assigned to Egmont Key NWR. The USCG owns 55 acres at the north end of the island, which includes the lighthouse. The Tampa Bay Pilots Association leases a 10-acre tract of land along the east side of the island, 5 acres of which is leased from the Service.

The refuge has boats, vehicles, all-terrain vehicles, and other equipment vital to pursuing its purpose. The boats are stored at Eckerd College boat yard in south St. Petersburg. Most of the staff works out of the offices at the Chassahowitzka NWR Complex, which is about 90 miles north of the Tampa/St.

Petersburg metropolitan area. However, a small office in the St. Petersburg area is being leased. The refurbished Guard House Building on Egmont Key NWR is also the property of the Service. Under an agreement with the Tampa Bay Pilots Association, the refuge staff has use of one of the Pilots' cabins. The refuge installed a storage shed and carport, which houses refuge vehicles including all-terrain vehicles and a mule. The refuge staff may also use the Pilots' dock. The Pilots Association also assists refuge staff with transportation of equipment, supplies, and/or people as needed.

Access to the refuge islands is by boat only. Egmont Key NWR is the only island that allows public access, and it has some trails that need to be maintained to allow access to different areas of the refuge. Passage Key and Pinellas NWRs have no trails or roadways.

III. Plan Development

SUMMARY OF ISSUES, CONCERNS, AND OPPORTUNITIES

The planning team identified a number of issues, concerns, and opportunities related to fish and wildlife protection, habitat restoration, recreation, and management of threatened and endangered species. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. An initial planning meeting for the Draft CCP/EA was held October 12, 2005, which included representatives from the FWC and the FDEP, among other agencies. The team also directed the process of obtaining public input by holding three public scoping meetings for the Tampa Bay Refuges. The meetings were held in Hillsborough, Pinellas, and Manatee Counties in February 2006. Comment forms were available at these meetings and at headquarters for submittal via mail or e-mail. In addition, oral comments made at the meetings were duly noted. All public and advisory team comments were considered; however, some issues important to the public fall outside the scope of the decision to be made within this planning process. The team considered all issues that were raised throughout the planning process, and has developed a plan that attempts to balance the competing opinions regarding important issues. The team identified those issues that, in the team's best professional judgment, are most critical to the refuge. A summary of these issues follows.

FISH AND WILDLIFE POPULATION MANAGEMENT

Threatened and Endangered Species

Recovery and protection of threatened and endangered plants and animals are important responsibilities delegated to the Service and its national wildlife refuges. The Tampa Bay Refuges provide habitat and protection for the threatened piping plover and Atlantic loggerhead turtle, and for the endangered manatee.

One or two piping plovers have been observed on Egmont Key NWR from September to December each year. Egmont Key NWR is designated as critical habitat for the piping plover. Passage Key NWR could also be used as wintering habitat by piping plovers. Erosion of beach habitat is a serious problem on both Egmont Key and Passage Key NWRs.

Approximately 20 to 60 Atlantic loggerhead sea turtles nests have been recorded annually on Egmont Key NWR, which is listed as an "index nesting beach" by the State of Florida. This designation means that it is an important site for determining an index of sea turtle population status and trends along the Atlantic (and Gulf) coast of the United States to determine progress towards recovery. Passage Key NWR has also been used by loggerhead sea turtles for nesting.

The number of loggerhead turtle nests may be declining due to loss of habitat caused by severe erosion occurring along the west beach of Egmont Key NWR. The greatest threat to sea turtle nests is severe beach erosion caused by high tides, storm tides, tropical storms, and hurricanes. Fire ants and ghost crabs occasionally invade sea turtle nests and destroy the eggs.

Small numbers of West Indian manatees have been observed in the seagrass beds along the east side of Egmont Key NWR and occasionally around Passage Key and Pinellas NWRs during the spring and summer. These areas are outside refuge jurisdiction; however, efforts need to be made to protect the manatees and their habitats near refuge lands.

State-Listed Species

Gopher tortoises are a state-listed species of special concern in Florida. Approximately 1,300 to 1,700 gopher tortoises live on Egmont Key NWR. Illegal poaching, recreational collecting, and malicious harming of gopher tortoises have been documented.

Two plant species, inkberry, and prickly pear cactus and one other species that is proposed for listing, the hairy beach sunflower, grow on Egmont Key NWR. Active management, in cooperation with the FPS, would be required to protect these plants from invasive exotic species and human activity.

Mangrove-Nesting and Roosting Waterbirds

The current mangrove nesting areas are on Pinellas NWR, with some nesting occurring in the mangroves on Egmont Key NWR. The bird species nesting on Pinellas NWR do so mostly in mangroves, predominantly on Little Bird Key. In years past, nesting occurred widely on other keys, especially on Tarpon and Whale Keys.

Mangrove nesting and roosting waterbirds are in need of protection and include many species of concern. The long-legged wader, the reddish egret, a State Species of Special Concern, is found nesting in the Tampa Bay area. Their population has stabilized in the last few years after the stoppage of the millinery trade. The roseate spoonbill, brown pelican, tricolored heron, and white ibis, four other State Species of Special Concern, as well as the yellow-crowned night heron and black-crowned night heron are some of the other species found nesting on the refuges. Although not breeding in Tampa Bay, the keys in Pinellas NWR may represent important post-breeding roost sites for the magnificent frigatebird.

Tarpon Key was an important nesting, resting, and feeding area for a variety of colonial nesting waterbirds, including the white ibis, reddish egret, and roseate spoonbill. Very little nesting has been documented since 2002, when consistent predator control efforts ceased and this colony succumbed to raccoons and possibly fish crows. In addition, some of the mangrove habitat has been lost due to erosion from boat wakes and storm surges. Exotic vegetation, particularly the Brazilian pepper and the Australian pine, is spreading on the islands replacing the native vegetation and habitat. Although the islands in the Pinellas NWR are closed to all public use, illegal access by the public still occurs and causes birds to abandon their nests or flushes the birds from their nests allowing predators to invade. Improper disposal of monofilament fishing line and trash, and oil spills have caused mortalities among the birds.

Beach-Nesting Waterbirds and Shorebird Species

Optimal beach habitat for birds is becoming scarce as private land is being developed. Egmont Key NWR has two wildlife sanctuaries totaling 97 acres on the south end and the east side of the island to protect nesting, resting, and feeding birds. These sanctuaries are closed to the public year-round. The northwest beach is closed seasonally to protect black skimmer and least tern nesting colonies. Passage Key NWR is a Wilderness Area and is closed to the public year-round. Approximately 38,000 pairs of birds nested on Egmont NWR's beaches in 2007, up from 50 pairs in 1998. Approximately 1,000-2,000 birds, including brown pelicans, laughing gulls, royal terns, and black skimmers, nested on Passage Key NWR in 2004. However, Passage Key NWR became an intermittent island in 2005, and sometimes is almost completely submerged.

Large and important colonies of brown pelicans, laughing gulls, and royal and sandwich terns occur on Egmont Key NWR and historically on Passage Key NWR. The sandwich tern, in particular, has a strong presence on Egmont Key NWR and historically on Passage Key NWR. Ninety percent of sandwich tern pairs in peninsular Florida reside in the Tampa Bay area, 66 percent of those are on Egmont Key and Passage Key NWRs. Laughing gulls have shown a 60 percent decline in the past 25 years in Florida. Among nesting shorebirds, plovers and oystercatchers are the highest priority species. Among the colonial nesting species, black skimmers and least terns are the highest priority species.

Similar to the mangrove-nesting and roosting waterbirds, the major issues that threaten the beach-nesting waterbirds and shorebird species populations are predators (e.g., dogs, rats, and fish crows); human disturbance, both inside and outside of the closed areas; erosion of beach habitat; invasive plant species (e.g., Brazilian pepper and Australian pine) and other native plants (e.g., sea oats and low herbaceous plants); improper disposal of monofilament lines and trash; and oil spills, all reducing nesting habitat for terns and skimmers.

Landbirds

Landbirds of conservation interest include mangrove breeding species on Pinellas NWR, and transient nearctic-neotropical migratory species on Pinellas and Egmont Key NWRs. Mangroves support a number of landbirds of continental and regional concern, specifically, the mangrove cuckoo, black-whiskered vireo, and the Florida prairie warbler. The gray kingbird is a species of local interest. Dozens of nearctic-neotropical migratory species regularly pass through Tampa Bay and are priorities on the national level or within specific physiographic regions. Availability of extensive and diverse mangrove and hardwood hammock habitats would accommodate the invertebrate, fruit, and nectar demands of most in-transit forest-dwelling species.

Mosquito control on adjacent lands may indirectly affect insectivore food supplies for both breeding and migratory landbirds. Currently the status and trends of Florida's mangrove-associated landbird species is undetermined, particularly in the Tampa Bay region.

Reptiles

Gopher tortoises were addressed under State-listed species. Egmont Key NWR also supports very high densities of Florida box turtles. The exotic Brazilian pepper thickets on Egmont Key NWR create a microclimate conducive to box turtles and their favorite food, cockroaches. Attempts to eliminate exotic plant species from the refuges would reduce the Brazilian pepper thickets. Use of prescribed fire to restore habitat conditions could also negatively affect box turtle densities. Like the gopher tortoise, the box turtle is threatened by illegal poaching, recreational collecting, and malicious harming of the animals.

Diamondback terrapins nest in the uplands of Tarpon Key on Pinellas NWR. This species is considered to be in decline through much of its distribution because of habitat loss and from drowning due to being caught in crab traps.

A male specimen of the mole skink was identified on Egmont Key NWR among sea oats and Australian pine. The specimen found was thought to have unique features, suggesting that the island's population could represent an undescribed subspecies. More information is required. Like the box turtle, reduction of exotic plant species and sea oats could compromise the mole skink's habitat.

HABITAT MANAGEMENT

Erosion

Erosion on the Tampa Bay Refuges is a major habitat management concern. Beach erosion management has included beach renourishment on Egmont Key NWR. However, beach renourishment done too frequently could lead to depletion of invertebrates in the substrate that may not be able to recover from the last event. Depletion of the invertebrates would temporarily impact foraging shorebirds. Managing Passage Key NWR by use of beach renourishment may be in conflict with its wilderness area designation. Maintenance of the wilderness character of this refuge requires minimum active management of the land, allowing natural processes to control the conditions. However, if erosion of Passage Key NWR continues, the island may become submerged for extended periods of time and may no longer serve the purpose of a nesting island for migratory birds. Stabilization of beach and mangrove habitats with native vegetation, such as *Spartina alterniflora*, or by use of oyster shells is also important.

Native Habitat Conditions and Exotic Plant Species

Returning the refuges to their likely native habitat conditions prior to European settlement of the island is a goal of the Service. A decision must be made regarding what type of native habitat would be most suitable today. The control and/or removal of exotic plant species, particularly Brazilian pepper and Australian pine, are required to protect native habitat for priority species on the refuges. Prescribed burning is one method that could help eliminate exotic plants, however, the fire could negatively impact wildlife populations if improperly managed. The removal of exotic plant species could also disturb nesting birds, if done during certain times of the year or by certain means. Removal of sea oats and Brazilian pepper from the refuges could reduce habitat for the box turtle and mole skink, however, these are not the priority species.

Sea Grasses

Sea grasses off the coast of the refuges are important foraging area for manatees, and habitat for other wildlife. Protection of these areas is important, but is outside the jurisdiction of the Service.

Global Warming and Sea Level Rise

Florida's coasts and coastal national wildlife refuges are expected to be negatively impacted by sea level rise in the next century. Some species may initially gain more access to habitat as sea level rises and certain habitats advance, while other habitats deteriorate and recede. Despite an apparent initial benefit to some species in the short term, the long-term impacts of sea level rise are expected to be primarily negative for most species. Changes to Florida's coastal habitats would alter habitats including sea grasses, salt marsh, freshwater marsh, mangroves, hardwood swamp, cypress swamp, tidal flats and beaches. Changes to Florida's coastal habitats would impact Florida's wildlife, including gamefish species and shorebirds (McMahon 2006).

Global warming can lead to other stressors besides sea level rise, which could also threaten coastal refuges. Global warming will result in altered precipitation patterns, such as more intense hurricanes and more extreme rainfalls and droughts. Global warming will also result in higher average air and water temperatures that foster increased algal blooms and hypoxic conditions that are damaging to fish and other aquatic species, coral bleaching, and marine diseases (McMahon 2006).

Sea Level Affecting Marshes Model (SLAMM) analysis was run for Egmont Key and Pinellas NWRs, using SLAMM versions 4.1 for Egmont Key NWR and SLAMM version 5.0 for Pinellas NWR. Egmont Key NWR is projected to experience a loss of coastal habitats including dry land, tidal flats, and salt marsh in the next century, as well as a slight decrease in estuarine open water. The refuge would experience a considerable increase in open ocean (McMahon 2006). The area around Pinellas NWR is predicted to lose tidal flats due to inundation and erosion. According to the SLAMM simulations run, the primary dynamic affecting mangrove abundance at Pinellas NWR is the rate of mangrove accretion compared to the rate of sea level rise. Because mangroves generally accrete at a high rate, they are more resilient to sea level rise. However, once sea level rise exceeds mangrove accretion rates, all mangroves are predicted to quickly disappear (Clough 2008).

Passage Key NWR is an intermittent island and much or all of its land mass could be lost because of sea level rise. As the sea level rises and changes occur, adaptive management of the changing habitat would be required, and the Service would consider acquiring new lands to provide habitat for priority species.

See Appendix L for copies of “Rising Tides: A Summary of Projected Impacts of Sea Level Rise on Florida’s Coasts and Ding Darling, Egmont Key, Pine Island and Pelican Island National Wildlife Refuges” (McMahon 2006) and “Application of the Sea-Level Affecting Marshes Model (SLAMM 5.0) to Pinellas National Wildlife Refuge” (Clough 2008).

RESOURCE PROTECTION

Because of their small size and importance to nesting, migrating, and roosting shorebirds and other waterbirds, Pinellas and Passage Key NWRs are closed to all public use year-round. Two wildlife sanctuaries on Egmont Key NWR, one located on the south end and the other located on the east or bay side of the island, are closed to the public year-round to protect the birds and the sea grass beds. The northwest beach of Egmont Key NWR is closed seasonally to protect black skimmer and least tern nesting colonies. Illegal access to these areas threatens the wildlife and the habitat. The sea grass habitat is outside the Service’s jurisdiction. Generally, urban development and its associated recreational encroachment and potential water and air contamination threaten all refuge resources.

Overflights from recreational ultralights, small planes, and news aircraft during oil spills or other events can disturb the birds. Flushed birds leave their nests, making the eggs and chicks vulnerable to predators and the elements. FAA navigation charts show “recommendations” to fly above 2000 feet over national wildlife refuges and other special areas, but it is not enforced. If harassment (flushing a bird off of a nest) occurs to an endangered or threatened species, aircraft operators would be in violation of the Endangered Species Act. If a bird is killed or “take” occurs, they may be violating the Migratory Bird Treaty Act.

On Egmont Key NWR there are historical structures of national significance, including remnants of Fort Dade and the lighthouse. Erosion at the shoreline and mistreatment by the public are compromising the structures. Some of the fort structures are now surrounded by water and swimmers dive to explore them. In addition, accumulation of fuel loads on Egmont Key NWR has increased the risk of wildfires on the island. Fire management, including suppression of fires or removal of the fuel loads, would be required to prevent property and cultural resources damages due to uncontrolled fire.

VISITOR SERVICES

There is a general lack of awareness regarding the Service's mission, purpose, and management objectives, particularly as it relates to the Tampa Bay Refuges. Minimal outreach is being conducted, and environmental education and interpretation opportunities are lacking at the refuges.

The Tampa Bay Refuges' staff has not promoted wildlife-dependent recreation at the three refuges. Passage Key and Pinellas NWRs are closed for public use; however, there are still opportunities for wildlife observation and photography from the water. Egmont Key NWR has very good vantage points for wildlife observation and photography, and the Service could provide good opportunities for environmental education and interpretation. However, lack of facilities at the refuge and staff located off-site and outside the Tampa Bay/St. Petersburg vicinity undermines these opportunities. Currently, there is an informational sea turtle panel on Egmont Key NWR's west beach. Fishing is allowed in the waters surrounding Pinellas NWR and fishing from shore is allowed on Egmont Key NWR. Off-shore fishing around Pinellas NWR may disturb the birds nesting near shore.

Problems are occurring on Egmont Key NWR due to overcrowding and overuse. Unregulated commercial tours bring over 60,000 visitors to Egmont Key NWR annually. Boaters, anglers, swimmers, and sunbathers gather at Egmont Key NWR where there is no available fresh water for public consumption and sanitation facilities are sparse or unavailable.

REFUGE ADMINISTRATION

The Tampa Bay Refuges are administered by the staff headquartered at Chassahowitzka NWR. The lack of staff assigned specifically to the Tampa Bay Refuges, and the lack of staff and facilities (e.g., headquarters, fresh water, and sanitation facilities) located at the refuges have prevented them from realizing their full potential. Environmental education and interpretation opportunities have not been realized, and the Service's refuge regulations have not been adequately enforced.

Overcrowding and overuse of Egmont Key NWR have become an issue. Lack of a controlled access point to the island and unregulated commercial tours have contributed to the problem. In addition, the carrying capacity of the island has not been determined, which would be required to manage the refuge and park properly.

Jurisdictional issues exist regarding the management and operation of the refuges and overlaying state park. The Service and the FPS jointly manage Egmont Key NWR and state park. Each has conflicting missions, purposes, and management objectives for Egmont Key NWR. The Service's main priority is to protect the fish and wildlife and their respective habitats. The FPS manages the public use activities at the state park, which allows for recreation unrelated to wildlife. The FPS also assists the Service in resource management. Common and consistent rules and regulations need to be adopted for the refuge and park for effective, coordinated management.

The USCG property (55 acres) at the north end of Egmont Key NWR is currently controlled by the Bureau of Land Management. The Tampa Bay Pilots Association leases a 5-acre tract of land from Hillsborough County on the eastern edge of the island, about mid-island, and it leases another 5 acres from the Service. These lands are not being managed in a manner consistent with the Service's land on the island. Exotic vegetation control, fire management planning, and signage are fairly non-existent for the combined 60 acres, which compromise the Service's goals and objectives for Egmont Key NWR.

Wilderness Review

Refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. The Service inventoried other refuge lands within the planning area and found no areas that meet the eligibility criteria for a wilderness study area as defined by the Wilderness Act. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this Draft CCP/EA. The results of the wilderness review are included in Appendix H.

IV. Management Direction

INTRODUCTION

The Service manages fish and wildlife habitats considering the needs of all resources in decision-making. But first and foremost, fish and wildlife conservation assumes priority in refuge management. A requirement of the Improvement Act is for the Service to maintain the ecological health, diversity, and integrity of refuges. Public uses are allowed if they are appropriate and compatible with wildlife and habitat conservation.

Described below is the proposed comprehensive conservation plan for managing the refuge over the next 15 years. This proposed management direction contains the goals, objectives, and strategies that will be used to achieve the refuge vision.

Three alternatives for managing the refuge were considered: Alternative A – Current Management – No Action; Alternative B – Moderately Expanded Programs; and Alternative C – Service Manages all of Egmont Key NWR and Expands Programs. Each of these alternatives is described in Section B. The Service chose Alternative B, Moderately Expanded Programs, as the proposed management direction.

Implementing the proposed alternative would result in the Service directing and coordinating more of the activities that affect the refuges, such as wildlife surveying, research, and habitat conservation. Wildlife surveying would be expanded and the Service would initiate research related to gopher tortoises, sea turtles, migratory birds, and other species. Greater predator control and greater regulation of illegal access to closed areas would be accomplished by hiring a biological technician and a full-time law enforcement officer for the Tampa Bay Refuges. A visitor services center, with restroom facilities, would be developed at the Egmont Key NWR Guard House to provide educational opportunities related to the wildlife and cultural resources. Wildlife photography and observation opportunities would also be enhanced by allowing limited access to closed areas and by the construction of an observation tower on Egmont Key NWR for better viewing of the wildlife. Increased public use opportunities, including outreach and interpretation, would be accomplished with the addition of a public use specialist.

VISION

The Tampa Bay Refuges provide essential wildlife habitat with opportunities for research, the protection of cultural resources, and quality environmental and outdoor recreation. Egmont Key, Pinellas and Passage Key NWRs are vital links in the Tampa Bay area for nesting, resting, and wintering migratory birds, threatened and endangered species, and resident wildlife. Protecting these refuges, with their diverse, but declining habitats, and abundant wildlife and cultural resources, is critical for ensuring the enjoyment and use of the islands by future generations.

GOALS, OBJECTIVES, AND STRATEGIES

The goals, objectives, and strategies presented are the Service's response to the issues, concerns, and needs expressed by the planning team, the refuge staff and partners, and the public. Chapter V, Plan Implementation, identifies the projects associated with the various strategies.

These goals, objectives, and strategies reflect the Service's commitment to achieve the mandates of the Improvement Act, the mission of the Refuge System, and the purposes and vision of the Tampa Bay Refuges. The Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

Goal 1. Provide habitat and protection for migratory birds, mangrove-nesting and roosting waterbirds, and beach-nesting waterbird and shorebird species.

Discussion: The purposes of the refuges are to protect and provide habitat for nesting, feeding, and resting migratory birds, colonial nesting waterbirds, and native birds; to conserve and protect the barrier island habitat; and to provide critical habitat for trust species.

Erosion is the foremost problem for Egmont Key and Passage Key NWRs, and is an issue for Pinellas NWR as well. Exotic and invasive vegetation, particularly Brazilian pepper and Australian pine, have altered natural habitats, which support the trust species on the refuge. In addition, a hazardous substance spill from the heavy recreational and commercial traffic in Tampa Bay and the Egmont Channel has the potential to adversely impact the refuges.

Objective 1: Within five years of reaching staffing goals, develop baseline data and monitoring programs to evaluate the status and trends of migratory and resident bird species on the refuges to support healthy populations in the region.

Discussion: The Service conducts bird surveys on a monthly basis when able, and peak nesting surveys are also conducted by Service staff working with partners. The surveys all need to be lead and coordinated by the Service to ensure that standardized monitoring techniques are utilized and the data is compiled and assessed comprehensively. Additional surveys and increased frequency of surveying are required to accurately determine the status and trends of bird populations.

Strategies:

- The Service would lead the bird surveys. The surveying would be conducted on a monthly basis and would include data on counts, species, and distribution per island and zone.
- The Service would continue to conduct annual peak nesting bird surveys with partners.
- The Service would lead and coordinate additional surveys with partners, such as the International Shorebird Survey, Audubon Christmas Bird Count, and the International Piping Plover Survey.
- The existing data would be summarized/analyzed to compare historical data with current data, especially where declines are noted.

Objective 2: Restore Egmont Key NWR to a 300-acre island and maintain the island with no net loss within the 15-year life of the CCP.

Discussion: Egmont Key NWR has lost nearly half of its acreage since 1877, and has lost nearly one third since 1969. In 1877, Egmont Key was 539 acres, and in 1974, when it was designated a national wildlife refuge, it was 392 acres. Now the refuge portion of the island is 240-250 acres. Current beach renourishment activities on Egmont Key NWR are facilitated on irregular intervals through other organizations that coordinate with the Corps. The renourishment efforts have focused primarily on the northwest end of the island where the cultural and historical resources are located and where the beach is open to the public. The beach is eroding along the entire west side of the island. A more comprehensive approach is needed to mitigate the loss of beach and to maintain the

island. The environmental impacts of long-term beach renourishment would be evaluated and addressed prior to implementing routine beach renourishment at the refuge.

Strategies:

- The Service would continually encourage involvement of the Friends Group and wildlife-oriented non-governmental organizations to support continued beach renourishment on Egmont Key NWR.
- The Service would monitor the effects of current and future beach renourishment on invertebrates and wildlife.
- The Service would develop a long-term beach renourishment plan for all of Egmont Key NWR, which would determine the location, frequency, quantity of material, etc., for routine beach renourishment on the island. The Service would routinely coordinate directly with the Corps for implementation.
- The Service would explore the possibility of restoring the natural sand drift to the island.
- The Service would explore the possibility of hard armoring (i.e., installation of rock jetties, rip rap) to prevent erosion of the island.

Objective 3: Maintain Pinellas NWR islands at current acreage with no net loss.

Discussion: Some mangrove habitat has been lost due to erosion from boat wakes, storm tides, tropical storms, and hurricanes. Renourishment to prevent further erosion and to allow mangrove seedlings to be established is recommended.

Strategies:

- The Service and partners would install oyster shell bars as needed near the edge of islands to aid in shoreline stabilization.
- The Service and partners plant smooth cordgrass (*Spartina alterniflora*) as needed near the shoreline of the islands to allow mangrove seeds to take root.
- The Service would coordinate with the state to create an idle speed zone between Little Bird Key and the nearby sea wall to reduce the impact of boat wakes.

Objective 4: Restore Passage Key NWR to 36 acres and maintain with no net loss within the 15-year life of the CCP.

Discussion: Restoring Passage Key NWR would require some interpretation of the Wilderness Act to determine the “minimum tool necessary” to accomplish the task. The erosion of Passage Key NWR is caused in some part by human activity in the Tampa Bay (heavy boat traffic and dredging), as well as by storms. Currently, the island ranges in size from 0.5-10 acres, and can be virtually submerged for periods of time. If Passage Key NWR becomes submerged for extended periods of time, it would no longer serve the purpose of providing habitat for colonial waterbirds.

Strategies:

- The Service would continually encourage involvement of the Friends Group and wildlife-oriented non-governmental organizations to support beach renourishment on Passage Key NWR, as allowed by wilderness designation.

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- The Service would routinely coordinate directly with the Corps and includes Passage Key NWR as part of the long-term beach renourishment plan for Egmont Key NWR, as allowed by wilderness designation.
 - The Service would explore the possibility of installing oyster domes to reduce wave action that causes erosion of Passage Key NWR.

Objective 5: Complete eradication of exotic and invasive vegetation on all refuge islands within five years of CCP approval.

Discussion: To maintain the natural diversity of wildlife and habitat, pervasive exotic and invasive species must be controlled.

Strategies:

- Increase exotic control efforts by hiring one biological technician.
- Service staff, partners, and contractors would use mechanical, chemical, and/or manual means to remove exotic and invasive vegetation from the refuges.
- After the initial removal of exotic and invasive vegetation, prescribed fire would be utilized approximately every three years on Egmont Key NWR.
- Monitor the effects of prescribed fire on wildlife and vegetation.
- Restore habitat, especially on Egmont Key NWR where Brazilian pepper has been removed, with native plants.
- Continue to monitor refuges for reinfestation and treat as needed.

Objective 6: Maintain 15 acres of nesting tern and skimmer habitat on Egmont Key NWR within five years of CCP approval. Increase acreage as tern and skimmer populations increase.

Discussion: Terns typically nest in open areas with sparse, short vegetation. Their nests consist of depressions in the sand or eggs are merely laid on the surface of more solid substrates such as rocks, crushed shells, or gravel. Areas where terns typically nest on Egmont Key NWR are being overgrown with native plants, reducing the size of the area suitable for nesting. Skimmers nest on sandy or gravelly bars and beaches at the refuge.

Strategies:

- Remove or reduce native plants in and around tern and skimmer nesting habitat manually, mechanically, or by the use of prescribed fire.
- Seasonally close beach habitat within the public use areas on the island with twine and flagging to encourage use by beach-nesting birds.

Objective 7: Within one year of becoming a member of the Tampa Bay Refuges staff, ensure personnel are familiar with the County Spill Response Plans, and, in the event of a spill, know how to react to protect the refuges' wildlife and habitat.

Discussion: Vessels containing billions of gallons of oil and other hazardous substances pass through Tampa Bay and Egmont Channel annually. Cargo ships, cruise ships, and recreational boats add to the heavy traffic. In 1993, a three-way ship collision at the mouth of Tampa Bay caused 300,000 gallons of oil to be released. Service personnel should be prepared in case there is another spill.

Strategies:

- The Service would support the County Spill Response Plans.
- The Service would coordinate with partners to respond to spills.

Objective 8: Eradicate raccoons and rats from refuge islands within two years of CCP approval, and remove predatory fish crows on a continual basis.

Discussion: Colonies of birds have been devastated by raccoon predation, in particular, nesting birds on Tarpon Key. Predation by fish crows has increased recently and rats have become a serious issue on Egmont Key NWR. Predator control on the refuge islands is critical to protect wildlife.

Strategies:

- Hire one biological technician to live trap raccoons and rats.
- Use Service personnel and/or contractors as needed.
- Continue to monitor refuges for reinfestations and remove predators as needed.

Objective 9: Reduce the occurrences of refuge violations on an on-going basis.

Discussion: The southern end and an eastern portion of Egmont Key NWR are closed to all public use year-round to protect the birds, and a vessel exclusion zone has been established around the seagrass beds on the east side of the island to protect them from propeller damage. Small areas of the public beach can be closed seasonally to protect certain bird populations or buried turtle eggs. Pinellas and Passage Key NWRs are closed to the public year-round to protect wildlife and critical habitat. Illegal access to closed areas or human disturbance even outside of the closed areas can cause birds to abandon their nests or flush from their nests, allowing predators to move in. Bird nests on the ground are often hard to detect as the nest and eggs visually blend into their surroundings. Access to closed areas could inadvertently destroy these eggs and buried turtle eggs by trampling.

Strategies:

- Increase Service law enforcement presence by hiring one full-time law enforcement officer.
- Improve, maintain, and increase the number of signs designating closed areas, and those prohibiting dogs on Egmont Key NWR.
- Install barriers to prevent entry to closed areas.
- In coordination with FPS, determine the public use capacity of Egmont Key NWR and manage visitation, overcrowding, and commercial tours within five years of reaching staffing goals.
- Explore the possibility of extending the Service law enforcement jurisdiction around the islands beyond mean high tide through an agreement with the state or port authority, a submerged land lease, changing the acquisition boundary of the refuges, or other means.
- Improve awareness of the role of the Service, the purposes of the refuges, and the reason for closed areas through educational opportunities.

Objective 10: Continue routine removal of improperly disposed monofilament fishing line and other waste from refuge islands and beaches.

Discussion: Fishing line and other trash entangle birds, manatees, fish, turtles, and other wildlife, and causes death to the animal entangled.

Strategies:

- Continue to work with partners to remove improperly disposed material.
- Through education, improve public awareness of the hazards caused by improper disposal of material.
- Rescue entangled, oiled, and injured animals when possible.

Objective 11: Establish a fire management program on Egmont Key NWR to reduce hazardous fuel loads and to protect wildlife and island facilities from catastrophic wildfire events.

Discussion: Large amounts of vegetative biomass from exotic species control efforts and tree die-offs from tropical storm events cover most of Egmont Key NWR. A prescribed fire would drastically reduce the threat of a catastrophic wildfire event and would improve nesting and foraging habitat for most refuge species, including gopher tortoise and beach-nesting birds.

Strategies:

- The Service would complete a fire management plan within one year of CCP approval.
- The Service's fire management office would conduct prescribed burns as needed to reduce hazardous fuel loads and to improve habitat.
- The Service and partners would educate and improve public awareness of the benefits of controlled burning and the hazards of increasing fuel loads.
- The Service would maintain fire-breaks around island facilities and cultural resources.

Goal 2. Provide habitat and protection for threatened and endangered species and state-listed species.

Discussion: Another purpose of the refuges is to provide habitat and protection for threatened and endangered species and species of special concern, which include federal, state, and internationally listed species.

Objective 1: Protect and conserve sea turtle nesting habitat on Egmont Key and Passage Key NWR beaches.

Discussion: The Atlantic loggerhead sea turtle is a threatened species located in the Tampa Bay area. Threats to adult loggerheads include being trapped in fishing nets and being injured by boat propellers. Commercial, residential, and recreational development has decreased the amount of coastal habitat available for nesting sea turtles. Female sea turtles nest on Egmont NWR beaches. The refuge is an Index Beach Site for the Atlantic loggerhead sea turtle. Erosion of the refuge beaches and barriers to nesting areas, such as fallen palm trees, are reducing sea turtle habitat on the refuge. Additional threats to sea turtles include nest predation by raccoons or poaching by humans.

Strategies:

- Develop and implement a long-term beach renourishment plan for Egmont Key NWR and Passage Key NWR. (See Goal 1, Objectives 2 and 4.)
- Control predators such as raccoons (see Goal 1, Objective 8), and continue to post sea turtle nests on the refuge to prevent disturbance.
- Hire one full-time Service law enforcement officer to enforce refuge regulations and prevent poaching of sea turtle eggs.

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- Remove barriers to nesting by removing fallen palm trees as needed.
 - Hire one biological technician to direct and lead monitoring efforts with partners.
 - Continue Index Nesting Beach Surveys.
 - Continue to support the Loggerhead Sea Turtle Recovery Plan.
 - Initiate sea turtle research to support sea turtle recovery.

Objective 2: Protect and conserve designated critical habitat for piping plovers on Egmont Key NWR beaches.

Discussion: Piping plovers are a threatened species that breed and feed on beach habitat. Commercial, residential, and recreational development has decreased the amount of coastal habitat available for piping plovers. Egmont Key has been designated as a critical habitat for piping plovers. However, erosion of the refuge beaches is reducing the piping plover critical habitat, and public beach use may be interfering with the foraging and roosting of these birds. Public access to closed areas disturbs wintering birds.

Strategies:

- Develop and implement a long-term beach renourishment plan for Egmont Key and Passage Key NWRs. (See Goal 1, Objectives 2 and 4.)
- Control predators such as raccoons (see Goal 1, Objective 8).
- Hire one full-time Service law enforcement officer to enforce refuge regulations.
- The Service would direct and lead monthly surveys and coordinate additional surveys with partners.
- The Service would participate in the International Piping Plover Survey that occurs every five years.

Objective 3: Protect and conserve manatee sea grass feeding habitat on east side of Egmont Key NWR.

Discussion: The West Indian manatee is an endangered species found primarily along the coast of Florida. The largest problems facing the manatee are caused by man. Speeding boats run over many manatees that are submerged just below the surface, which either kills them or maims them. A vessel exclusion zone has been established around the sea grass beds on the east side of Egmont Key NWR to protect seagrass and manatees that feed on the vegetation.

Strategies:

- The Service would continue to cooperate with the state and other partners to enforce the vessel exclusion zone around the sea grass beds on the east side of Egmont Key NWR.
- Expand the vessel exclusion zone out from the shore, and clarify the boundary by creating a straight border.

Objective 4: Protect and conserve the Egmont Key NWR gopher tortoise population, increase their burrowing and foraging habitat from 50 acres to 100 acres or more, and maintain the habitat within the 15-year life of the CCP.

Discussion: The FWC has listed the gopher tortoise as a threatened species for the following reasons: (1) it has a significant vulnerability to habitat modification, environmental alteration, human disturbance, or human exploitation; (2) it may already meet certain criteria for designation as a

threatened species; and (3) it may occupy such an unusually vital or essential ecological niche that should it decline significantly in numbers or distribution other species would be adversely affected to a significant degree. Egmont Key gopher tortoises are unique in having demonstrated adaptive behavior different from the mainland gopher tortoises by living three to four in a burrow instead of just one to a burrow. The poaching and collecting of gopher tortoises by humans threaten the species and is illegal.

Strategies:

- Use mechanical, chemical, and/or manual means as needed, followed by prescribed fire, to remove exotic and invasive vegetation from areas designated as gopher tortoise habitat.
- Hire one full-time law enforcement officer to enforce refuge regulations.
- Initiate regular monitoring and research on Egmont Key NWR's gopher tortoises.

Objective 5: Conserve and protect state-listed vegetation on refuge lands.

Discussion: State-listed plants are known to grow on the refuges. Populations of listed plants need to be identified, locations and populations identified, and protected.

Strategies:

- Work with university and non-governmental partners to survey refuge lands to identify and map the location of each species.
- Use mechanical, chemical, and/or manual means as needed, followed by prescribed fire (Egmont Key NWR), to remove exotic and invasive vegetation from areas where state-listed plants are growing.
- Hire one full-time law enforcement officer to enforce refuge regulations.

Goal 3. Provide quality wildlife-dependent recreation at Egmont Key NWR, and impart understanding of Importance of the Service's role in conservation and management of wildlife and habitat.

Discussion: Over 25 commercial operators transport 70,000 visitors to Egmont Key NWR annually. One of the purposes of the refuge is to provide wildlife-dependent recreation and environmental education for the public. The Tampa Bay Refuges' staff has not promoted wildlife-dependent recreation at the refuge due to lack of facilities and staff. The Service's priority public uses are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Hunting is not an appropriate use for the refuge.

Objective 1: Increase environmental education and interpretation opportunities for the public within the 15-year life of the CCP.

Strategies:

- The Service, working with partners, would open Egmont Key Guard House/Visitor Center and provide wildlife and cultural education exhibits and opportunities.
- Hire one full-time public use specialist.
- Establish an on- and off-site environmental education program and provide regular public education events.
- Improve and increase the number of interpretive signs and kiosks .

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- Update and distribute the Tampa Bay Refuges brochure.
 - Provide occasional interpretive tours.
 - Require tour operators to operate under the Service's special use permit program. Tour operators would be required, by the permit, to provide refuge interpretation.
 - Construct an ADA-compliant commercial dock near the new Visitor Center to safely disembark passengers and to improve management of public use.

Objective 2: Improve opportunities for wildlife observation and wildlife photography on Egmont Key NWR within the 15-year life of the CCP.

Strategies:

- Provide access to a photography blind on Egmont Key NWR.
- Construct a wildlife observation tower.
- Provide opportunities for closed-circuit television viewing of wildlife (e.g., nesting birds in closed areas) at the Egmont Key Guard House/Visitor Center.

Goal 4. Protect and interpret cultural and historical resources for the benefit of future generations.

Discussion: Egmont Key NWR has a long history of occupation. During the late 19th to early 20th century, Fort Dade was located on Egmont Key, and in the mid-19th century, Egmont Key Lighthouse was listed on the National Register of Historic Places. The Tampa Bay Refuges' staff has not provided cultural resource educational opportunities on a regular basis due to lack of facilities and staff.

Objective 1: Increase awareness and opportunities for cultural resources interpretation.

Strategies:

- Working with the state, establish a Visitor Center at the Egmont Key Guard House to include cultural resources exhibits.
- Remove vegetation on and around the historical structures on a regular basis.
- Improve historical interpretive signs within in 2 years of meeting staffing goals.
- Working with partners, provide occasional interpretive tours for the public.

Goal 5. Properly manage the refuges to meet refuge goals and objectives.

Objective 1: Improve coordination and cooperation between the Service and FPS for more efficient and effective management of Egmont Key NWR.

Discussion: Egmont Key NWR is managed by the Service and the FPS under a cooperative agreement. Generally, the state is responsible for public recreation and interpretation of natural and cultural resources located predominantly on the north end of the island. The Service is primarily responsible for the management of all wildlife and habitat on the refuge.

Strategies:

- Continue the Egmont Key NWR cooperative management agreement with the state.
- Ensure that the State Unit Management Plan and the CCP are consistent.
- Conduct monthly teleconference calls and quarterly meetings with the state to facilitate better communication, coordination, and cooperation.

Objective 2: Improve and enhance partnership opportunities and relationships.

Discussion: The Service has numerous partners to assist in meeting the goals and objectives of the Tampa Bay Refuges. Other federal agencies, state and local governments, non-governmental organizations, universities, and local groups are all partners of the Service.

Strategies:

- Promote and support increasing “Friends” membership to 150+ members within five years of CCP approval.
- “Friends” Group would share office/storage space with Service once new office is leased.
- Hold an annual partnership meeting.

Objective 3: Incorporate all vacated non-refuge land on Egmont Key under the Service as it becomes available.

Discussion: For consistent management of wildlife and habitat on Egmont Key, consolidate the property under Service ownership. One property owner, instead of three on the island, would be more efficient for management.

Strategies:

- Facilitate the transfer of the USCG property (approx. 10 acres) to the Service.
- Within one year of CCP approval, establish the Service’s interest in the Tampa Bay Pilot Compound property, to include acquisition of the 5-acre tract leased from Hillsborough County, in the event that occupancy changes.

Goal 6. Provide adequate staff and resources to meet refuge goals and objectives.

Discussion: Currently, there is one full-time position assigned to the Tampa Bay Refuges. To meet the proposed objectives, additional staff would need to be hired. A boat, vehicles, and heavy equipment would need to be purchased to allow the staff to access the refuges’ lands and to complete their tasks. Facilities would need to be procured or constructed to accommodate the refuges’ staff and equipment, and to accommodate the proposed visitor services needs.

Objective 1: Within ten years of CCP approval, hire staff, purchase equipment, and construct facilities to support and accommodate the proposed visitor services objectives and biological objectives.

Strategies:

- Hire one full-time law enforcement officer to enforce refuge regulations for the protection of wildlife and habitat, and ensure the safety of visitors on a daily basis.
- Hire one full-time biological technician to support the proposed additional surveying and predator control.
- Hire one full-time public use specialist to provide the proposed environmental education and interpretation opportunities.
- Hire one part-time administrative office assistant to support the increased staff.
- Purchase boats, vehicles, and heavy equipment needed for the refuge staff to meet the proposed objectives.

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- Install a Service dock on Egmont Key NWR.
 - Construct a visitor center and restrooms at the Guard House Building, and install a water treatment plant to accommodate these facilities.
 - Pursue housing and office space at the Pilots' Compound on Egmont Key, and provide office space and storage space on the mainland to accommodate larger staff and new equipment.
 - Construct a commercial dock near the new Visitor Center for transferring equipment on and off the island. The dock would also be used by commercial operators ferrying the public to and from the island.

V. Plan Implementation

INTRODUCTION

Refuge lands are managed as defined under the Improvement Act. Congress has distinguished a clear legislative mission of wildlife conservation for all national wildlife refuges. National wildlife refuges, unlike other public lands, are dedicated to the conservation of the Nation's fish and wildlife resources and wildlife-dependent recreational uses. Priority projects emphasize the protection and enhancement of fish and wildlife species first and foremost, but considerable emphasis is placed on balancing the needs and demands for wildlife-dependent recreation and environmental education.

To accomplish the purpose, vision, goals, and objectives contained in this plan for the Tampa Bay Refuges, this section identifies projects, funding and personnel needs, volunteer and partnership opportunities, step-down management plans, a monitoring and adaptive management plan, and plan review and revision.

PROPOSED PROJECTS

Listed below are the proposed project summaries and their associated costs for fish and wildlife population management, habitat management, resource protection, visitor services, and refuge administration over the next 15 years. This proposed project list reflects the priority needs identified by the public, planning team, and refuge staff based upon available information. These projects were generated for the purpose of achieving the refuge's goals and objectives. The primary linkages of these projects to those planning elements are identified in each summary.

FISH AND WILDLIFE POPULATION MANAGEMENT

1. Eradicate or Control Exotic and Invasive Predators.

Egmont Key NWR hosts some of the largest and most important bird nesting colonies in Florida. The refuge is also a key loggerhead sea turtle index site, since it is the only index beach on the entire Gulf coast monitored by both state and federal wildlife agencies. Nest predation by invasive predators is a major concern for Egmont Key and Pinellas NWRs. The black rat was unintentionally introduced to the island of Egmont Key in 2006, and will likely have a severe impact on nesting success of all refuge wildlife. The islands of Pinellas NWR have already suffered a nearly total collapse in bird nest success largely due to raccoon predation. This project would allow the refuge to coordinate and contract with USDA, Wildlife Services, to implement current mammalian predator control techniques to accomplish total eradication of nest predators from refuge islands. (Linkages: Goal 1, Objective 8) First-year cost: \$130,000; Recurring costs: \$5,000

2. Science-based Inventory and Monitoring of Plant and Animal Populations.

Science-based inventorying and monitoring of plant and animal populations are critical to ensuring the biological integrity of the refuges. The information collected is used to make sound decisions concerning habitat management, predator control, location of closed areas, and to focus law enforcement efforts. Comprehensive inventories are needed for beach-nesting birds, colonial waterbirds, gopher tortoises, box turtles, diamondback terrapins, and state-listed plants found within the three Tampa Bay Refuges. Daily monitoring of sea turtle nesting activity is needed during the summer nesting season. Data collected will contribute to state, regional, and national databases and provide

long-term contributions to national objectives for endangered and imperiled species, including loggerhead turtles and piping plovers, shorebirds, wading birds, and neotropical migratory birds. This project will address comprehensive monitoring and data management with the addition of a biological technician. (Linkages: Goal 1, Objectives 1, 5, 6, 7, 8, 10; Goal 2, Objectives 1-5; Goal 6, Objective 1)
First-year cost: \$45,000; Recurring costs: \$45,000

HABITAT MANAGEMENT

3. Eradicate or Control Exotic and Invasive Plants

Exotic and invasive plant species are one of the greatest threats to habitat loss on Egmont Key and Pinellas NWRs. Large stands of exotic plants (e.g., Australian pine and Brazilian pepper) cover nearly 40 percent of Egmont Key NWR. Other invasive plants, including strangler fig and coin vine, spread rapidly. Collectively, these nuisance plants displace lush forbs and grasses and significantly reduced nesting and foraging habitat for birds and reptiles. The proven method to eliminate each of these nuisance species requires costly herbicide applications, and remains difficult to accomplish with present staffing levels. Cooperation with partners, the use of volunteer labor, and grants have slowed the infestation of exotics on Egmont Key NWR to approximately 100 acres. Prescribed burning and mechanical treatments are needed to maximize attempts to control invasive plants and restore preferred habitat. This project will utilize contract labor to eradicate current acres infested by exotic plants. It will also secure adequate reserves of herbicide to control re-sprouts and new growth. (Linkages: Goal 1, Objectives 5-6; Goal 2, Objectives 4-5; Goal 3, Objective 2; Goal 4, Objective 1)
First-year cost: \$100,000; Recurring costs: \$15,000

4. Fire Management Program on Egmont Key NWR

Fire is a natural part of the central Florida ecosystem and wildfires are an ever-present threat to plants, wildlife, and facilities on Egmont Key NWR. Prescribed fire can be used to minimize wildfire impacts by reducing accumulated fuel loads and to restore beneficial native vegetations like grasses and forbs from monoculture invasive plant stands. Implementation of prescribed fire on the refuge is reliant on fire crews and fire expertise from other refuges located several hours away in north Florida. Implementation of a prescribed fire program on Egmont Key NWR will require additional, in-house operational support, including fire training and personal protective equipment for refuge staff, and on-site fire equipment. This project will also enhance our partnerships with state and local partners willing to respond to refuge wildfires. (Linkages: Goal 1, Objectives 5, 6, 8, 11; Goal 2, Objectives 4-5; Goal 3, Objective 2; Goal 4, Objective 1; Goal 5, Objective 1)
First-year cost: \$70,000; Recurring costs: \$15,000

5. Erosion Monitoring and Beach Restoration

The largest external threat to the Tampa Bay Refuges is erosion. Over 260 acres (50 percent) of Egmont Key NWR have been lost to erosion in the past 130 years. Passage Key NWR has eroded to a half-acre sandbar only visible during low tides. In order to ensure continued habitat for beach-nesting birds and sea turtles, an active beach renourishment program needs to be implemented. Suitable sand dredged from nearby marinas and/or channels could be placed on the refuges instead of being dumped offshore. Two past beach renourishment projects have successfully restored beach habitat for nesting birds and sea turtles and have also protected cultural resources on Egmont Key NWR. Sand placements typically only lasts about five years before being eroded again by high tides and severe tropical storms including hurricanes. This project consists of continuing to work with the

Corps to divert sand from dredged projects to the refuges, and to use GIS mapping to monitor refuge acreages. (Linkages: Goal 1, Objectives 2, 4)
First-year cost: \$5,000; Recurring costs: \$5,000

6. Mangrove Restoration for Pinellas NWR

Several mangrove islands of Pinellas NWR have lost acres to erosion from storm events over the years. These islands once provided habitat for thousands of brown pelicans, double-crested cormorants, herons, egrets, and roseate spoonbills, which nested annually. Habitat restoration projects coordinated by local partners (Tampa Bay Watch) have successfully limited further erosion by stabilizing sections of shoreline with the installation of oyster shell bars and saltmarsh grass plantings. This project will continue restoration efforts with Tampa Bay Watch and support new projects with other partners. (Linkage: Goal 1, Objective 3)
First-year cost: \$5,000; Recurring costs: \$5,000

7. Habitat Maintenance for Beach Nesters

The majority of birds nesting on Egmont Key and Passage Key NWRs prefer open, sandy beaches for nesting. Currently, dense sea oats and other low herbaceous vegetation have invaded the open beach habitat, thus making the habitat unsuitable for beach-nesting birds. This vegetation must be removed or thinned manually (hand-pulling, raking), mechanically (plowed), or by conducting controlled burns. This project will support mechanical removal of encroaching vegetation. (Linkages: Goal 1, Objectives 2, 4, 5, 6, 7, 10, 11; Goal 2, Objectives 1-2)
First-year cost: \$5,000; Recurring costs: \$5,000

RESOURCE PROTECTION

8. Protect Refuge Resources and Visitors

More than 165,000 visitors recreationally use the Tampa Bay Refuges annually. Closed area trespass, illegal harvest of plants and animals, vandalism, littering, bird and turtle nest disturbance, and other illegal activities have increased due to lack of regular law enforcement patrols. In the past, one complex full-time officer would conduct weekend law enforcement during summer months. Currently, one collateral-duty officer is solely responsible for enforcement activities, but ever-increasing public use and other assigned duties limit the officer's ability to adequately address threats to refuge visitors and wildlife. Furthermore, the refuge system is gradually moving away from collateral-duty officers in favor of full-time officers. The addition of a full-time law enforcement officer would dramatically improve visitor safety and resource protection. (Linkages: Goal 1, Objectives 7-9; Goal 2, Objectives 1-5; Goal 5, Objective 2; Goal 6, Objective 1)
First-year cost: \$70,000; Recurring costs: \$70,000

9. Cultural Resource Protection and Interpretation

The 100-year-old remnants of Fort Dade and 150-year-old lighthouse located on Egmont Key were listed on the National Register of Historic Places in 1978. Cultural resources need to be protected from vandalism and need to be maintained from encroachment by native and exotic plants. Acquisition of the land off-refuge where these cultural resources are located would aid in the care, management, and interpretation of these exhibits. Through this project, access to resources will be maintained and interpretive signs and regular tours of these resources will be established with the assistance of partners. (Linkages: Goal 1, Objectives: 5; Goal 3, Objective 1; Goal 4, Objective 1; Goal 5, Objectives 1-3)
First-year cost: \$30,000; Recurring costs: \$5,000

10. Land Acquisition

A minor expansion plan has been completed for Egmont Key NWR. Two parcels are outside the current acquisition boundary. A 55-acre parcel at the north end of the island is officially owned by the U.S. Coast Guard, which discontinued operations on the island in 1995. The other parcel possibly available in the future is a 5-acre tract on the east side of the island and is currently occupied by the Tampa Bay Pilots Association (TBPA) under a 99-year lease with Hillsborough County. The TBPA is always actively looking for a more cost-effective site to base their operations. Acquisition of these two parcels of land would improve management of Egmont Key NWR by streamlining coordination, facilities, and primary missions of the island. Additional habitat for wildlife and important cultural resources would be acquired and managed by the Service instead of several different entities (FPS, USCG, TBPA).

(Linkages: Goal 1, Objectives 2, 5, 6; Goal 2, Objectives 1, 2, 4 5; Goal 3, Objectives 1-2; Goal 4, Objective 1; Goal 5, Objectives 3, 6)

First year cost: \$6,000,000; Recurring costs: \$0

11. Minimize Impacts of Trash, Marine Debris, and Oil Spills

A substantial amount of litter, monofilament, and marine debris is regularly deposited onto refuge beaches and vegetation (mangroves) and can harm wildlife and injure visitors. This project would work with the partners to use signs, brochures, and other tools to educate the public about the harmful effects of marine debris and monofilament. This project would provide support for monthly refuge clean-up events with partners and the refuges' friends group. Refuge staff would support the Hillsborough County Oil Spill Response Plan and coordinate with partners to respond to oil spills.

(Linkage: Goal 1, Objectives 7, 10)

First-year cost: \$20,000; Recurring costs: \$5,000

VISITOR SERVICES

12. Visitor Center and Environmental Education

Approximately 165,000 visitors come to Egmont Key NWR annually. Currently, the Fort Dade Guardhouse building on Egmont Key has been restored to function as a visitor center and island museum. Interactive exhibits need to be developed to highlight the natural and cultural resources of the island and the Tampa Bay Refuges. Environmental education and Interpretive programs (guided nature hikes and tours), can be conducted within and from the center. This project would include exhibit development/ installation, and would purchase environmental education supplies and equipment for on- and off-site programs. This project also includes the addition of a Park Ranger to coordinate all aspects of visitor services, including environmental education, outreach, recreation, visitor facilities, partnerships, visitor center operations, media, and the volunteer program.

(Linkages: Goal 3, Objectives 1-2, Goal 4, Objective 1; Goal 6, Objective 1)

First-year cost: \$565,000; Recurring costs: \$70,000

13. Improve Wildlife-dependent Recreation

The Tampa Bay Refuges provide a diversity of wildlife observation and recreational opportunities. Fishing is permitted in waters around refuge islands. Abundant underwater wildlife can be viewed when swimming, snorkeling, and diving in the sea grass beds along the east side of Egmont Key and at its submerged gun battery along the southeast side. These refuges are utilized year-round by migrating, wintering, feeding, and nesting birds. There are plenty of opportunities to view wildlife up-close on Egmont Key NWR. The public can watch beach-nesting birds outside of sanctuary areas, or resident gopher tortoises and box turtles as they wander throughout the island. This project involves providing interpretive kiosks which show the location of the areas accessible to the public and the permitted/prohibited activities. This project will also establish photo blinds to increase opportunities

for wildlife photography and observation. A closed-circuit television in the visitor center could provide live video feed of birds nesting high in trees and in closed areas. (Linkages: Goal 3, Objectives 1-2, Goal 4, Objective 1; Goal 6, Objective 1)
First-year cost: \$50,000; Recurring costs: \$5,000

REFUGE ADMINISTRATION

14. Construct New Refuge Dock

There is a clear need for refuge docking facilities at Egmont Key NWR. Currently, refuge vessels are afforded limited docking space to the privately owned Pilot's dock. Privately owned pilot vessels receive priority access to the one available boat slip and mooring overnight puts refuge vessels at risk of damage or loss due to laterally impacting wave action during rough weather. This project will construct a 6-foot-wide boardwalk in a "T" shaped dock 180 feet from the refuge shore. Two 13,000-pound boat lifts will be attached to each end of the dock. (Linkage: Goal 6, Objective 1)
First-year cost: \$150,000; Recurring cost: \$2,000

15. Construct New Public Restroom Facility by Egmont Key Guardhouse

Over 165,000 visitors come to the island of Egmont Key annually. The newly reconstructed Fort Dade Guardhouse will soon become the Refuge Visitor Center, with wildlife and cultural exhibits, but the facility is in desperate need of an adjacent public restroom facility. This project will construct a self-contained restroom building that does not use freshwater and includes an extensive drain field or composting system. The facility will be able to handle high daily use.
(Linkage: Goal 3, Objective 1; Goal 6, Objective 1)
First-year cost: \$950,000; Recurring cost: \$25,000

16. Construct New Shop/ Bunk House Facility on Egmont Key NWR

There is a glaring need for refuge-owned sleeping and equipment storage facilities on the remote island of Egmont Key. Currently, refuge staff and volunteers use a 500-square-foot historic cottage originally built in 1911. The cottage is located within the Tampa Bay Pilot Association's compound and is provided to refuge staff as per memorandum of understanding with the Pilots. Refuge vehicles (ATV, Mule, Carts), signs, and equipment are stored within a small tool shed or under an open-air vehicle shelter, which offers poor protection from corrosion caused by salt air. This project would construct a facility capable of housing a dozen personnel overnight and include a full bathroom and kitchen. The facility would also provide a minimum of 1,500 square feet of enclosed storage for vehicles, supplies, and heavy equipment. The facility will be equipped with a reverse osmosis system to provide potable water.
(Linkage: Goal 6, Objective1)
First-year cost: \$750,000; Recurring cost: \$15,000

17. Construct New Commercial Docking Facility by Egmont Key Guardhouse

Over twenty-five commercial operators transport 70,000 refuge visitors to the island annually. A large commercial dock adjacent to the Refuge Visitor Center (Guardhouse) is needed to safely disembark passengers and to improve management of public use. (Linkage: Goal 3, Objective 1; Goal 6, Objective 1)
First-year cost: \$500,000; Recurring cost: \$15,000

18. Meet/Fulfill Heavy Equipment Needs

There is a strong need for a piece of heavy equipment on Egmont Key NWR. A small- to medium-sized four-wheel drive tractor with a set of attachments (bucket, backhoe, root rake, and bushhog) or a four-wheel drive backhoe loader is needed. Refuge staff could maintain established fire breaks, clear and level island trails used by visitors and staff, remove beach debris (palm trunks) impeding nesting sea turtles, maintain tern/skimmer beach nesting sites, and remove newly sprouting exotic plants. A tractor could also be used to support future construction projects. (Linkage: Goal 6, Objective 1)

First-year cost: \$75,000; Recurring costs: \$10,000

19. Replace All-Terrain Utility Vehicle

This project calls for the replacement of the 2006 Kawasaki Mule 4WD vehicle. This all-terrain vehicle is the primary mode of transportation to carry refuge staff, volunteers, equipment, and large refuge signs around the beaches and rough trails of the island. It is used for law enforcement, injured wildlife rescues, exotic species control, and wildfire suppression. All vehicles on the island need to be replaced after three years of service due to the extensive use and harsh environmental conditions (salt corrosion). (Linkage: Goal 6, Objective 1)

First-year cost: \$12,000; Recurring cost: \$1,000

20. Replace 25-Foot Work Boat

This project calls for the replacement of the 1986 Boston Whaler vessel with twin four-stroke outboard motors. This boat is the primary vessel used to transport staff, volunteers, and supplies to Egmont Key and Passage Key NWRs. This boat provides the only reliable passage to these island refuges regardless of wind or wave conditions. A replacement vessel with twin outboard motors capable of safely transporting a dozen passengers or a ton of cargo and able to load beach vehicles (ATV, Kawasaki Mule, electric carts) is needed. (Linkage: Goal 6, Objective 1)

First-year cost: \$125,000; Recurring cost: \$10,000

21. Replace 23-Foot Law Enforcement Boat

This project calls for the replacement of the 2000 Seacraft vessel with twin outboard motors. This boat is the primary vessel used by law enforcement officers to conduct patrol activities around Egmont Key and Passage Key NWRs. This boat is outfitted with blue lights/sirens and boat bumper to conduct vessel stops. A replacement vessel with twin outboard motors and a covered wheel house is needed to provide law enforcement coverage during the frequent poor weather situations occurring in Tampa Bay. (Linkage: Goal 6, Objective 1)

First-year cost: \$100,000; Recurring costs \$ 10,000

22. Administrative Support

If additional staff including a full-time refuge officer, biological technician, and park ranger were added to the current staff (assistant manager) living and working in Tampa Bay, additional administrative office space and support would be needed. A part-time permanent administrative office assistant would be needed to assist the complex office assistant (located 100 miles north the complex headquarters office) with the additional administrative workload. This project would also provide \$60,000 for GSA leased office space and computers needs. (Linkage: Goal 6, Objectives 1)

First-year costs: \$78,000; Recurring costs: \$ 78,000

Table 14 summarizes the proposed projects and associated costs and staffing needs.

FUNDING AND PERSONNEL

The Tampa Bay Refuges are satellite stations of the Chassahowitzka NWR Complex, with the headquarters office located in Crystal River, Citrus County, Florida. All five refuges in the complex share a budget and partially share staff. The Tampa Bay Refuges are staffed by an assistant refuge manager (GS-485-9/11) with collateral law enforcement authority who handles daily activities. The Complex staff provides assistance on large projects, biological surveys, and law enforcement activities. However, since Tampa Bay and Crystal River are over one hundred miles apart, it is not feasible to send staff to assist on a daily basis. The addition of a full-time law enforcement officer, public use specialist, biological technician, and part-time office assistant will be required for the refuges to achieve the goals and objectives outlined in this plan. The estimated cost for a full staff would be \$280,000 per year, based on the 2008 General Schedule salary table, including estimates for benefits and overtime pay.

PARTNERSHIP/VOLUNTEERS OPPORTUNITIES

A key element of this CCP is to establish partnerships with local volunteer groups, adjacent landowners, private organizations, and state and federal natural resource agencies. Many partnerships currently exist at the Tampa Bay Refuges, since a variety of partners help further the purposes, vision, goals, and objectives of the refuges through wildlife and habitat management activities, outreach, environmental education, other visitor services, and cultural resource protection. The Service will continue to work with existing partners and thrive to add new partners that will benefit the refuges.

STEP DOWN MANAGEMENT PLANS

A CCP is a strategic plan that guides the direction of a refuge. A step-down management plan provides more details and specific guidance on certain refuge program areas or activities, such as habitat, prescribed fire, and visitor services management. As implementation strategies in the CCP, step-down plans are also developed in accordance with the National Environmental Policy Act. Each of these plans will further address the priority issues raised during the comprehensive conservation planning process, the recommendations of the CCP review teams, and comments made by the public and other interested parties.

The staff of the Tampa Bay Refuges proposes to initiate, update, revise, and/or implement 12 step-down plans within the 15-year time frame of the CCP. A list of these plans and their associated completion dates is presented in Table 16. The following section describes the proposed step-down plans.

Law Enforcement Plan (Update), plan completed 2006: This plan provides a ready reference to Service, regional, and local law enforcement resources regarding refuge policies, procedures, and programs concerning refuge law enforcement. It describes the objectives of the law enforcement function on all refuges in the complex. It addresses the type of jurisdiction, active memoranda of understanding, and authorities of refuge officers both on and off the refuge. This plan discusses the procedures for addressing crimes on refuge lands, and includes patrols, traffic control, plain clothes operations, surveillance, and investigations. This plan includes procedures for documentation of both serious and routine incidents, warnings, and violation notices, and outlines procedures for custodial arrests, execution of warrants, intrusion alarm responses, searches and rescues, medical emergencies, and crowd control. This plan was approved in 2006 and will be reviewed every 5 years.

Table 14. Summary of proposed projects and costs (in 2008 dollars)

Projects Proposed to Implement Management Plan	Initial Project Cost (\$)	Annual Recurring Costs (\$) *	Staffing FTEs (3.5)
1. Eradicate or Control Exotic and Invasive Predators	\$130,000	\$5,000	--
2. Science-based Inventory and Monitoring of Plant and Animal Populations	\$45,000	\$45,000	Biological Technician
3. Eradicate or Control Exotic and Invasive Plants	\$100,000	\$15,000	--
4. Fire Management Program on Egmont Key NWR	\$70,000	\$15,000	--
5. Erosion Monitoring and Beach Restoration	\$5,000	\$5,000	--
6. Mangrove Restoration for Pinellas NWR	\$5,000	\$5,000	--
7. Habitat Maintenance for Beach Nesters	\$5,000	\$5,000	--
8. Protect Refuge Resources and Visitors	\$70,000	\$70,000	Refuge Officer
9. Cultural Resource Protection and Interpretation	\$30,000	\$5,000	--
10. Land Acquisition	\$6,000,000	--	--
11. Minimize Impacts of Trash, Marine Debris, and Oil Spills	\$20,000	\$5,000	--
12. Visitor Center and Environmental Education	\$565,000	\$70,000	Park Ranger
13. Improve Wildlife-dependent Recreation	\$50,000	\$5,000	--
14. Construct New Refuge Dock	\$150,000	\$2,000	--
15. Construct New Public Restroom Facility by Egmont Key Guardhouse	\$950,000	\$25,000	--
16. Construct New Shop/ Bunk House Facility on Egmont Key NWR	\$750,000	\$15,000	--
17. Construct New Commercial Docking Facility by Egmont Key Guardhouse	\$500,000	\$15,000	--

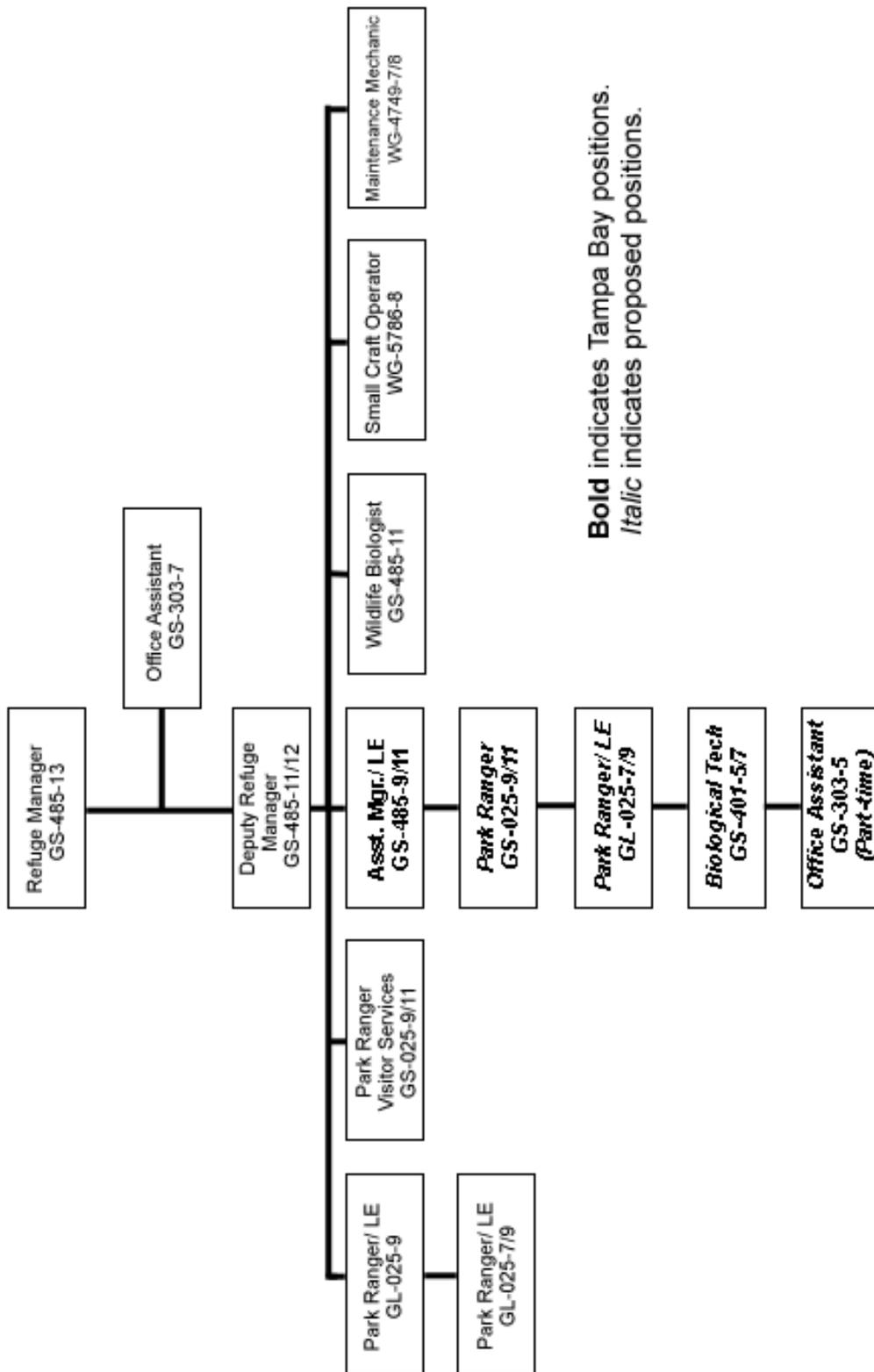
Projects Proposed to Implement Management Plan	Initial Project Cost (\$)	Annual Recurring Costs (\$) *	Staffing FTEs (3.5)
18. Meet/ Fulfill Heavy Equipment Needs	\$75,000	\$10,000	--
19. Replace All-Terrain Utility Vehicle	\$12,000	\$1,000	--
20. Replace 25-Foot Work Boat	\$125,000	\$10,000	--
21. Replace 23-Foot Law Enforcement Boat	\$100,000	\$10,000	--
22. Administrative Support	\$78,000	\$78,000	(PT) Office Assistant
Grand Totals:	\$9,835,000	\$416,000	3.5
Grand Total Without Land Acquisition:	\$3,835,000	\$416,000	

Table 15. Approximate annual costs of proposed staff positions in 2008 dollars

Title	Responsibility	RONS Project Number	Grade	Annual Cost
Refuge Officer	Resource Protection	99006	GS-7/9	\$70,000
Biological Technician	Wildlife Monitoring and Exotic Species Control	09003	GS-5/7	\$45,000
Park Ranger	Visitor Services	09002	GS-9/11	\$65,000
Office Assistant (PTE)	Administration	09004	GS-5	\$18,000
Total yearly cost:				\$198,000

Note: These figures have been incorporated into the project descriptions and their associated costs in Table 14.

Figure 18. Proposed organization structure for the management of the Tampa Bay Refuges-- current and proposed positions



Bold indicates Tampa Bay positions.
Italic indicates proposed positions.

Fire Management Plan (New Plan), completion 2009: This plan will describe the use of prescribed fire on Egmont Key, and also serve as a contingency plan in the case of wildfire activity on or near refuge property. The plan will implement the policies, objectives, and standards for fire management presented in the Fire Management Handbook (621 FW 1-5), Department Manual (620 DM), and Service Manuals (095 FW 3, 232 FW6, 241 FW 3, and 241 FW 7). It will provide guidance for achieving the resource management objectives defined in refuge resource management plans and the comprehensive conservation plan. Guidance will be provided to staff for carrying-out fire management operations, including prescribed burning for habitat improvement and fuel reduction, as well as wildfire suppression activities.

Wildlife Inventory and Monitoring Plan (New), completion 2010: This plan describes inventorying and monitoring techniques and methodologies for surveys of priority species or species groups. Several migratory bird and reptile species are monitored for nest success and population trends. Plant communities will also be addressed. The plan establishes timetables for inventorying and monitoring. Inventory data is essential to guide in management of wildlife habitat on refuges

Predator Control Plan (New Plan), completion 2011: This plan will include a description of refuge predator issues, control methods, and an explanation of the necessity to control mammalian and avian predators in order to protect priority refuge species.

Exotic/Invasive Plant Control Plan (New Plan), completion 2010: This plan will establish the strategy to eradicate or control exotic and invasive plants to maintenance levels. It will include monitoring protocols and control techniques, including herbicide applications, mechanical treatments, and the use of prescribed fire.

Oil Spill Response Plan (Update), plan completed 2007: This plan sets forth a strategy for protection of refuge shoreline and marine environments within and adjacent to refuge boundaries. This plan outlines refuge responsibilities and roll in responding to oil spills.

Refuge Sign Plan (New Plan), completion 2012: This plan will describe refuge strategies for informing visitors via signage including signs, kiosk, and buoys. It will incorporate Service sign policy guidelines. This plan will contain a photo, the message, GPS location, and condition of all refuge signs currently installed. The plan will specify signage needed to improve communication of information and regulations to the public.

Visitor Services Management Plan (New Plan), completion 2012: This plan will describe wildlife-dependent recreation, environmental education, and interpretive programs associated to the Tampa Bay Refuges. It will address specific issues or items, such as refuge access, facility operations, site plans, and handicapped accessibility. This plan will guide the Visitor Services' program on the refuges. The plan will also address wildlife and habitat needs, trail development, wildlife-dependent recreation priorities, and interpretation of cultural resources.

Commercial Use Monitoring Plan (New Plan), completion 2013: Access to Egmont Key is by personal boat or commercial tour boats. This plan will address commercial uses and operations on Egmont Key NWR.

Cultural Resource Protection Plan (New Plan), completion 2013: This plan will address management and protection of cultural resources on Egmont Key NWR, including inventory, interpretation, and restoration. This plan will contain current and historic photos of resources, GPS location, and history/current condition of all island cultural resources.

Habitat Management Plan (New Plan), completion 2011: This plan will guide all habitat management activities on the Tampa Bay Refuges, including habitat management and restoration, shoreline restoration, and exotic and invasive plant control. The plan will identify the wildlife habitat needs and outline the appropriate application of management tools, such as prescribed fire, herbicide and pesticide treatments, and mechanical or hand removal of vegetation. Wildlife and habitat monitoring will be incorporated into the plan. It will include parameters for using adaptive management principles to fine-tune management and to improve results for targeted, priority wildlife species, species groups, and habitat.

Hurricane/ Disaster Action Plan (Update), plan completed 2008: This plan outlines general procedures to be followed before, during, and after hurricane events or other disasters. It outlines staff responsibilities for preparations of facilities, equipment, vehicles, information systems, and files. This plan contains key contact information and GPS locations of refuge facilities and staff residences. The plan is updated annually.

Table 16. Step-down management plans related to the goals and objectives of CCP

Step-down Plan	Completion Date
Law Enforcement Plan (2006)	2012
Fire Management Plan (draft 2008)	2009
Wildlife Inventory and Monitoring Plan (new)	2010
Predator Control Plan (draft 2002)	2011
Exotic/ Invasive Plant Control Plan (draft 2007)	2010
Oil Spill Response Plan (2007)	2013
Refuge Sign Plan (new)	2012
Visitor Services Management Plan (new)	2012
Commercial Use Management Plan (new)	2013
Cultural Resource Protection Plan (new)	2013
Habitat Management Plan (new)	2011
Hurricane/ Disaster Action Plan (2006)	Annually

MONITORING AND ADAPTIVE MANAGEMENT

Adaptive management is a flexible approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. More specifically, adaptive management is a process by which projects are implemented within a framework of scientifically driven experiments to test the predictions and assumptions outlined within a plan.

To apply adaptive management, specific survey, inventorying, and monitoring protocols will be adopted for the refuge. The habitat management strategies will be systematically evaluated to determine management effects on wildlife populations. This information will be used to refine approaches and determine how effectively the objectives are being accomplished. Evaluations will include ecosystem team and other appropriate partner participation. If monitoring and evaluation indicate undesirable effects for target and non-target species and/or communities, then alterations to the management projects will be made. Subsequently, the CCP will be revised. Specific monitoring and evaluation activities will be described in the step-down management plans.

PLAN REVIEW AND REVISION

The Final CCP will be reviewed annually as the refuge's annual work plans and budgets are developed. It will also be reviewed to determine the need for revision. A revision will occur if and when conditions change or significant information becomes available, such as a change in ecological conditions or a major refuge expansion. The Final CCP will be augmented by detailed step-down management plans to address the completion of specific strategies in support of the refuge's goals and objectives. Revisions to the CCP and the step-down management plans will be subject to NEPA compliance.

SECTION B. ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

The Fish and Wildlife Service (Service) prepared this Environmental Assessment (EA) for Tampa Bay Refuges (Egmont Key, Passage Key, and Pinellas) in compliance with the National Environmental Policy Act (NEPA) and the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act). The Improvement Act requires the development of comprehensive conservation plans for all refuges. Following a public review and comment period on the Draft CCP/EA, a final decision will be made by the Service that will guide Tampa Bay Refuges management actions and decisions over the next 15 years, provide understanding about the refuges and management activities, and incorporate information and suggestions from the public and refuge partners.

The Draft CCP/EA proposes a management direction, which is described in detail through a set of goals, objectives, and strategies. The Draft CCP/EA addresses current management issues, provides long-term management direction and guidance for the refuge, and satisfies the legislative mandates of the Improvement Act. While the Draft CCP/EA provides general management direction, subsequent step-down plans will provide more detailed management direction and actions.

This EA determines and evaluates a range of reasonable management alternatives. The intent is to support informed decision-making regarding future management of the Tampa Bay Refuges. Each alternative presented in this EA was generated with the potential to be fully developed into a Final CCP. The predicted biological, physical, social, and economical impacts of implementing each alternative are analyzed in this EA. This analysis assists the Service in determining if the alternatives represent no significant impacts, thus requiring the preparation of a Finding of No Significant Impact (FONSI), or if the alternatives represent significant impacts, thus requiring more detailed analysis through an Environmental Impact Statement (EIS) and a Record of Decision (ROD). Following public review and comment, the Service will select an alternative to be fully developed for these refuges.

This CCP is needed to address current management issues, to provide long-term management direction for the refuge, and to satisfy the legislative mandates of the Improvement Act, which requires the preparation of a CCP for all national wildlife refuges.

PURPOSE AND NEED FOR ACTION

The purpose of the EA is to meet the purpose(s) of the refuges and the goals identified in the CCP (for which we evaluate each alternative). The purpose is to ensure that the Tampa Bay Refuges serve as a preserve and breeding ground for native birds; conserve threatened and endangered species such as the Atlantic loggerhead turtle, manatees, and piping plovers; serve the development, advancement, management, conservation, restoration, and protection of fish, wildlife, and habitat resources; provide opportunities for compatible, wildlife-dependent recreation; promote awareness and appreciation of the refuges' natural and cultural resources; administer and protect the wilderness character of Passage Key NWR; and protect and preserve cultural and historical resources on Egmont Key NWR. The need of the EA is to adopt a 15-year management plan that provides guidance for future management and that meets the mandates of the Improvement Act.

DECISION FRAMEWORK

Based on the assessment described in this document, the Service will select an alternative to implement the CCP for the Tampa Bay Refuges. The Final CCP will include a FONSI, which is a statement explaining why the selected alternative will not have a significant effect on the quality of the human environment. This determination is based on an evaluation of the Service and Refuge System mission, the purpose(s) for which the refuges were established, and other legal mandates. Assuming no significant impact is found, implementation of the CCP will begin and will be monitored annually and revised when necessary.

PLANNING STUDY AREA

The Tampa Bay Refuges include Egmont Key, Pinellas, and Passage Key. The refuges are located in the entrance of Tampa Bay along the Gulf Coast of Florida. The Tampa Bay area is the second most populated metropolitan region in the State of Florida, with a population close to three million people. The planning study area includes the lands and waters identified in the refuges' current acquisition boundaries, and those lands that are being considered for inclusion on Egmont Key NWR. This EA will identify management on refuge lands, as well as those lands proposed for acquisition by the Service.

AUTHORITY, LEGAL COMPLIANCE, AND COMPATIBILITY

The Service developed this Draft CCP/EA in compliance with the Improvement Act and Part 602 of the Fish and Wildlife Service Manual (National Wildlife Refuge System Planning). The actions described within this Draft CCP/EA also meet the requirements of NEPA. Compliance with NEPA has been achieved through the involvement of the public and the incorporation of this EA within the Draft CCP, with a description of the alternatives considered and an analysis of the environmental consequences of the alternatives. When fully implemented, the CCP will strive to achieve the vision and purposes of the Tampa Bay Refuges.

The CCP's overriding consideration is to carry out the purposes for which the refuges were established. The refuge purposes are stated in the laws that established each refuge and provided the funds for acquisition. Fish and wildlife management is the first priority in refuge management, and the Service allows and encourages public use (wildlife-dependent recreation) as long as it is compatible with, or does not detract from, the refuge's mission and purposes.

COMPATIBILITY

The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy Refuge System lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use "...will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge." In addition, "wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety."

An interim compatibility determination is a document that assesses the compatibility of an activity during the period of time the Service first acquires a parcel of land to the time a formal, long-term management plan for that parcel is prepared and adopted. The Service has completed an interim compatibility determination for the six priority general public uses of the system, as listed in the

Improvement Act. These uses are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

PUBLIC INVOLVEMENT AND THE PLANNING PROCESS

In accordance with Service guidelines and NEPA recommendations, public involvement has been a crucial factor throughout the development of the Draft CCP/EA for the Tampa Bay Refuges. This plan has been written with input and assistance from interested citizens, conservation organizations, and employees of local and state agencies. The participation of these stakeholders and their ideas has been of great value in setting the management direction for Tampa Bay Refuges. The Service, as a whole, and the refuge staff, in particular, are very grateful to each one who has contributed time, expertise, and ideas to the planning process. The staff remains impressed by the passion and commitment of so many individuals for the lands and waters administered by the Tampa Bay Refuges.

The planning process for the Tampa Bay Refuges began October 12, 2005, with a meeting of the planning team, which consists of refuge and other Service personnel, and representatives from the Florida Fish and Wildlife Conservation Commission (FWC). The team toured key features of the refuges and identified various issues and opportunities of the refuges related to resource protection, habitat restoration, and public use. To solicit additional input regarding issues and opportunities important to the public, state, tribal and local agencies, and other stakeholders, the planning team hosted open houses/public scoping meetings in Hillsborough, Pinellas, and Manatee Counties in February 2006. Comment forms were available at the meeting as well as at the refuges' headquarters. The completed forms were submitted by mail or e-mail and the input was considered and incorporated into the Draft CCP/EA.

A complete summary of the issues and concerns is provided in Section C, Appendix D, Public Involvement - Summary of Public Scoping Comments.

II. Affected Environment

For a description of the affected environment, see Section A, Chapter II, Refuge Overview.

III. Description of Alternatives

FORMULATION OF ALTERNATIVES

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve a refuge's purpose and vision, the goals identified in the CCP; the goals of the Refuge System; and the mission on the Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service and the public during public scoping.

The three alternatives identified and evaluated represent different approaches to provide permanent protection, restoration, and management of the refuges' fish, wildlife, plants, habitats, and other resources, as well as compatible wildlife-dependent recreation. Refuge staff assessed the biological conditions and analyzed the external relationships affecting each refuge. This information contributed to the development of refuge goals and, in turn, helped to formulate the alternatives. As a result, each alternative presents different sets of objectives for reaching refuge goals. Each alternative was evaluated based on how much progress it would make and how it would address the identified issues related to fish and wildlife populations, habitat management, resource protection and conservation, visitor services, and refuge administration. A summary of the three alternatives is provided in Table 17.

DESCRIPTION OF ALTERNATIVES

Serving as a basis for each alternative, a number of goals and sets of objectives were developed to help achieve each refuge's purpose and the mission of the Refuge System. Objectives are desired conditions or outcomes that are grouped into sets and, for this planning effort, consolidated into three alternatives. These alternatives represent different management approaches for managing these refuges over a 15-year time frame, while still meeting each refuge's purposes and goals. The three alternatives are summarized below. A comparison of each alternative follows the general description in Table 17. The table is grouped by each of the six goals outlined in Chapter IV of Section A. The terms "regular" and "routine," or "regularly" and "routinely," are used throughout the table. In general, the terms "regular" and "regularly" refer to activities performed approximately twice per month as personnel can get to them. The terms "routine" or "routinely" refer to activities that are scheduled and occur approximately once per week, the exception being in the description of prescribed fire and beach renourishment. The term "scheduled" refers to activities planned every three to five years.

ALTERNATIVE A - (CURRENT MANAGEMENT - NO ACTION)

The Tampa Bay Refuges have a diversity of community types and endemic species, with a number of threatened, endangered, and rare species and other species of concern. The primary mission of these refuges is to provide habitat for wildlife. The refuges currently have a small staff and funding source for the inventorying and monitoring of natural resources. Monthly bird surveys are conducted when able, and the Service participates in the international piping plover survey every five years. The Service also conducts annual peak nesting surveys of birds. The Atlantic loggerhead sea turtles are monitored daily by interns overseen by partners, but gopher tortoises are only monitored opportunistically by partners. Baseline data have yet to be established for state-listed plant species.

Wildlife and habitat are protected through a variety of management tools, such as area closures, predator control, law enforcement, exotic plant control, erosion control, and cleanup of trash. Currently, these activities (except for the closures) are generally conducted on an opportunistic basis or under the direction and guidance of others.

Wildlife-dependent recreation opportunities are available on Egmont Key NWR and around the other refuge islands. The Service occasionally works with partners to educate visitors and some interpretive signs have been posted. Wildlife photography and observation occur with only opportunistic encouragement from or facilitation by Service staff. Partners educate visitors regarding the cultural and historical resources on Egmont Key NWR.

The Service has a cooperative management agreement with the Florida Park Service (FPS) to manage Egmont Key NWR. Generally, FPS is responsible for public recreation and interpretation of natural and cultural resources located predominantly on the north end of the island. The Service is primarily responsible for the management of all wildlife and habitat on the refuge. Coordination between the Service and FPS occurs opportunistically, with meetings held approximately twice per year.

The refuges currently have one dedicated full-time assistant refuge manager, and are otherwise supported by nine staff members located 100 miles away at the Chassahowitzka NWR. The Service works with numerous partners to achieve refuge goals and objectives. Currently, the Service leases a temporary residence at the Pilots' Compound on the eastern side of Egmont Key NWR, and the assistant refuge manager has leased office space in St. Petersburg. The Service-owned Guard House Building on Egmont Key NWR has recently been renovated, although no restroom facilities are available there. Under this alternative, the existing level of administrative resources (e.g., staffing, facilities, equipment, and funding) would be maintained. This means that some positions may not be filled when vacated if funds need to be reallocated to meet rising costs or new priorities.

ALTERNATIVE B - (PROPOSED ALTERNATIVE)

This alternative assumes a slow to moderate growth of refuge resources over the 15-year implementation period of the CCP. The Service would take more of a leadership role by coordinating and/or directing activities and decisions made by partners that would have an impact on the refuges. Under this alternative, the Service would coordinate, direct, and conduct bird surveys and Atlantic loggerhead sea turtle surveys. The Service would coordinate additional bird surveys and would monitor and conduct research on the gopher tortoises of Egmont Key NWR. In addition, the Service, with partners, would identify, map and protect state-listed plant species on the refuges.

Protection of wildlife and habitat and visitor safety would be increased by the addition of a full-time law enforcement officer dedicated to the Tampa Bay Refuges. A biological technician would be hired to conduct bird surveys and to conduct predator and exotic species control. The following would be conducted on a regular or routine basis, with Service leadership and coordination: predator control, beach renourishment to counter erosion on Egmont Key NWR and to restore and maintain Passage Key NWR, exotic or invasive vegetation control using appropriate methods, and cleanup and education regarding proper disposal of monofilament fishing lines.

The visitor use opportunities would be expanded under this alternative. A public use specialist dedicated to Tampa Bay Refuges would be hired. Environmental education and interpretation opportunities would be expanded by opening the Egmont Key NWR Guardhouse and Visitor Center, providing regular educational events and occasional interpretive tours seasonally, and improving and increasing the number of interpretive signs and kiosks, among other activities. The Service would facilitate and create opportunities for wildlife photography and observation. The Service would also establish a Cultural Resources Management Unit on the northern end of the island centered on Fort Dade and the lighthouse.

Under this alternative, the cooperative agreement with the FPS to manage Egmont Key NWR would continue. Coordination between the Service and FPS would be enhanced by establishing monthly communications and quarterly meetings. The Service would facilitate the transfer of the USCG property on Egmont Key to the Service, and would establish the Service's interest in the Pilots' Compound property in the event that occupancy of that property changes. Acquisition of these lands would enable the Service to better conserve, protect, and manage the habitat on all of Egmont Key. The Service would continue to work with and improve relationships with its partners. The Service would promote and support increasing the Friends Group to more than 150 members, and the Friends Group would have office and storage space in a new Service office located in the Tampa Bay/St. Petersburg area.

Under this alternative the Service staff dedicated to the Tampa Bay Refuges would be increased to four full-time permanent employees and one part-time permanent employee. Larger office space to accommodate the increased staff and Friends Group would be acquired in the Tampa Bay/St. Petersburg area, as well as facilities for boat storage and use. Housing and office space and a Service dock at the Pilots' Compound would be pursued. Some new equipment would also be purchased to support the staff and increased activities at the refuges. The Service would create a Visitor Center at the Egmont Key Guardhouse, which would be established to educate the public on both the wildlife and cultural resources of the refuges. A dock meeting the Americans with Disabilities Act (ADA) requirements and restroom facilities would be constructed near the Guardhouse Visitor Center to accommodate the public and Service needs.

ALTERNATIVE C

This alternative assumes a moderate to substantial growth of refuge resources from internal or external sources. The Service would take on an even greater leadership role at the refuges. The Service would more fully realize the refuges' goals and objectives by enhancing and expanding the activities proposed under Alternative B.

The frequency of some monitoring (e.g., piping plover) would increase, and bird research would be initiated. Gopher tortoises would be routinely monitored and researched by the Service.

Protection of wildlife and habitat and visitor safety would be increased by the addition of two full-time law enforcement officers dedicated to the Tampa Bay Refuges. Control of exotic and invasive vegetation would occur on a routine basis.

The Service would provide educational events on a routine basis, and would provide weekly interpretive tours. Concessionaire(s) would be selected and would operate under Service contract. This would be another avenue to provide environmental education.

Under this alternative, the Service would own and manage all of Egmont Key NWR without sharing that responsibility with the FPS. An overlay state park, managed by FPS, would no longer exist. This would allow the Service to manage the island in a comprehensive manner by eliminating issues caused by the contrasting purposes of the Service and FPS. The Service staff dedicated to the Tampa Bay Refuges would be increased to seven full-time permanent employees. The Service would continue to work with and improve relationships with its partners, and would promote and support increasing the Friends Group to 200-300 members. Along with the facilities described under Alternative B, the Service would construct a shop/bunkhouse, and office building on Egmont Key NWR to provide on-refuge headquarters for Service personnel. Additional equipment would be purchased to support the staff and increased activities on the refuges.

FEATURES COMMON TO ALL ALTERNATIVES

Although the alternatives differ in many ways, there are similarities among them as well. These common features are listed below to reduce the length and redundancy of the individual alternative descriptions.

Cooperation between Service staff and local, state, and federal agencies, as well as with universities, non-governmental organizations, and other partners would continue, regardless of the alternative selected. Refuge operations, such as surveying, research, education and outreach efforts, depend on and are enhanced by the contributions from experts and volunteers outside of the refuge staff. The use of volunteers to supplement existing staff and resources is proposed for most facets of refuge operation and maintenance, with special emphasis on the visitor services programs. All alternatives are based on best available and professionally sound science, Endangered Species Act requirements, and compliance with all Service laws, policies, directives and guidelines.

Goal 1: Provide habitat and protection for migratory birds, mangrove nesting and roosting waterbirds and beach nesting waterbird and shorebird species.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Predation	Egmont Key	Service controls predators by approved methods on an opportunistic basis.	<ul style="list-style-type: none"> • Service controls predators by approved methods on a regular and as needed basis. • Hire biological technician to control predators/exotics. 	Same as Alternative B.
	Pinellas, Passage Key	Same as Egmont Key.	Same as Egmont Key.	Same as Egmont Key.
Illegal Access/Human Disturbance - Trespassing	Egmont Key	<ul style="list-style-type: none"> • Two complex law enforcement officers/collateral duty officers stationed off-site. On-site holiday weekends and on an opportunistic basis. • Signs are posted identifying protected areas. • Education conducted opportunistically. 	<ul style="list-style-type: none"> • One full-time law enforcement officer stationed locally. • One collateral duty officer. • Conduct law enforcement daily. • Increase number of signs and maintain signs. • Provide educational opportunities seasonally—kiosks, utilize the Egmont Key Guardhouse/Visitor Center. • Establish buffer zone 300 feet out from mean high tide around island – law enforcement jurisdiction area. 	<ul style="list-style-type: none"> • Two full-time law enforcement officers stationed locally. • Conduct law enforcement daily. • Increase number of signs and maintain signs. • Provide educational opportunities daily by staff and at Egmont Key Guardhouse/Visitor Center. • Establish buffer zone 300 feet out from mean high tide around island – law enforcement jurisdiction area.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
	Pinellas	<ul style="list-style-type: none"> • Same as Egmont Key. • Closed to the public. 	<ul style="list-style-type: none"> • Same as Egmont Key. • Closed to the public. • Create idle speed zone between Little Bird Key and nearby sea wall. • Add submerged lands lease similar to Tarpon Key for other islands. 	Same as Alternative B.
	Passage Key	<ul style="list-style-type: none"> • Same as Egmont Key. • Closed to the public. 	<ul style="list-style-type: none"> • Same as Egmont Key. • Closed to the public. • Establish buffer zone 300 feet out from exposed land around island – law enforcement jurisdiction area. 	Same as Alternative B.
Erosion	Egmont Key	<ul style="list-style-type: none"> • Service supports Corps projects directed by Congress, initiated by Citizen Support Organizations. • Erosion control projects focus on the north end of the island (off-refuge). 	<ul style="list-style-type: none"> • Service annually coordinates directly with Corps on the long-term beach renourishment plan and routine beach renourishments. • Comprehensive planning for beach renourishment addresses entire island. • Service encourages involvement of Friends Group and Wildlife-Oriented NGOs. 	Same as Alternative B.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
	Pinellas	Erosion control measures are implemented opportunistically.	<ul style="list-style-type: none"> Erosion control measures are implemented as needed. Create idle speed zone between Little Bird Key and nearby sea wall. 	Same as Alternative B.
	Passage	No beach renourishment, natural processes control.	<ul style="list-style-type: none"> Restore and maintain Passage Key as allowed by wilderness designation. Consider installation of erosion controls (e.g., bulk head barrier). 	Same as Alternative B.
Exotic/Invasive Vegetation	Egmont Key	Control of exotics/invasives conducted opportunistically with partners.	Control of exotics/invasives conducted regularly with partners using herbicides and prescribed fire.	Control of exotics/invasives conducted routinely with herbicides in coordination with prescribed fire.
	Pinellas	Control of exotics/invasives conducted opportunistically.	Control of exotics/invasives conducted as needed.	Control of exotics/invasives conducted routinely.
	Passage Key	Not an issue.	Not an issue.	Not an issue.
Improper Disposal of Monofilament Line and Trash	Egmont Key	Cleanup and education conducted opportunistically with partners. Information in Service distributed Boca Ciega Boater's Guide.	Cleanup and education conducted regularly with partners. Continue to work with partners to educate the public.	Cleanup and education conducted routinely with partners. Continue to work with partners to educate the public.
	Pinellas, Passage Key	Cleanup and education conducted opportunistically.	Cleanup and education conducted regularly.	Cleanup and education conducted routinely.
Oil Spills	Egmont Key	Coordinate with partners. Support County Oil Spill Response Plan.	Same as Alternative A.	Same as Alternative A.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
	Pinellas, Passage Key	Same as Egmont Key.	Same as Egmont Key.	Same as Egmont Key.
Conservation of Habitats	Egmont Key	Conservation efforts conducted opportunistically. (Sea oats removal, burning, etc.)	Conservation efforts like burning conducted annually with partners.	Conservation efforts conducted regularly with partners.
	Pinellas	Conservation efforts conducted opportunistically. (plant spartina, oyster shell work)	Conservation efforts conducted annually with partners.	Conservation efforts conducted regularly with partners.
	Passage Key	See erosion control.	See erosion control.	See erosion control.

Goal 2: Provide habitat and protection for threatened and endangered species and state-listed species.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Atlantic Loggerhead Sea Turtle – Threatened	Egmont Key	<ul style="list-style-type: none"> • Opportunistic beach renourishment (see erosion control). • Opportunistic removal of fallen palm trees. • Monitor turtles with partners. • Protect turtle nests. 	<ul style="list-style-type: none"> • Scheduled beach renourishment (see erosion control). • Fallen palm trees removed as needed. • Service leads turtle monitoring with partners. • Protect turtles and nests. 	<ul style="list-style-type: none"> • Scheduled beach renourishment (see erosion control). • Fallen palm trees removed as needed. • Service monitors turtles daily (during summer) with partners. • Protect turtles and nests.
	Pinellas	N/A	N/A	N/A
	Passage Key	See erosion control.	See erosion control.	See erosion control.
Piping Plover - Threatened	Egmont Key	<ul style="list-style-type: none"> • Opportunistic beach renourishment (see erosion control). • Piping plovers surveyed with routine bird surveys, international survey every 5 years. 	<ul style="list-style-type: none"> • Scheduled beach renourishment (see erosion control). • Service leads surveys and coordinates additional surveys with partners. 	<ul style="list-style-type: none"> • Scheduled beach renourishment (see erosion control). • Service leads surveys and coordinates additional surveys with partners. • Service and partners monitor piping plovers daily.
	Pinellas	N/A	N/A	N/A
	Passage Key	See erosion control and bird surveys.	See erosion control and bird surveys.	See erosion control and bird surveys.
West Indian Manatees - Endangered	Egmont Key	Vessel exclusion zone around submerged aquatic vegetation is uneven, can be confusing.	Move vessel exclusion zone out from land, create a straight line.	Same as Alternative B.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
	Pinellas, Passage Key	N/A	N/A	N/A
Gopher Tortoises	Egmont Key	<ul style="list-style-type: none"> Monitoring done opportunistically by partners for teaching purposes. Habitat is approximately 50 acres. 	<ul style="list-style-type: none"> Conduct monitoring and research based on sound science. Improve/Increase habitat through prescribed fire to 100-200 acres. 	<ul style="list-style-type: none"> Regular monitoring and research projects conducted by Service with qualified researchers. Improve/Increase habitat through prescribed fire to 100-200 acres.
	Pinellas, Passage Key	N/A	N/A	N/A
State-Listed Plant Species (one proposed for listing)	Egmont Key	See exotic/invasive vegetation.	<ul style="list-style-type: none"> Conduct surveys to identify state-listed plant species through partnerships with universities and NGOs. Map and protect species. 	<ul style="list-style-type: none"> Service conducts surveys to identify state-listed plant species. Map and protect species.
	Pinellas, Passage Key	See exotic/invasive vegetation.	Same as Egmont Key.	Same as Egmont Key.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Bird Surveys	Egmont Key	<ul style="list-style-type: none"> • Service conducts monthly bird surveys, when able. • Service conducts annual peak nesting surveys with partners. 	<ul style="list-style-type: none"> • Service leads and continues monthly surveys with partners. • Designate biological technician to conduct surveys. • Coordinate additional surveys with partners e.g.: <ul style="list-style-type: none"> ○ International Shorebird Survey ○ Audubon Christmas Bird Count ○ International Piping Plover Survey 	<ul style="list-style-type: none"> • Service leads and continues monthly surveys with partners. • Designate biological technician to conduct surveys. • Coordinate additional surveys with partners e.g.: <ul style="list-style-type: none"> ○ International Shorebird Survey ○ Audubon Christmas Bird Count ○ International Piping Plover Survey • Conduct research.
	Pinellas	<ul style="list-style-type: none"> • Partners conduct monthly bird surveys. • Service conducts annual peak nesting surveys with partners. 	Same as Egmont Key, as applicable to Pinellas-specific birds.	Same as Egmont Key, as applicable to Pinellas-specific birds.
	Passage Key	<ul style="list-style-type: none"> • Partners conduct monthly bird surveys. • Service conducts annual peak nesting surveys with partners. 	Same as Egmont Key, as applicable to Passage Key-specific birds.	Same as Egmont Key, as applicable to Passage Key-specific birds.

Goal 3: Provide quality wildlife-dependent recreation at Egmont Key NWR, and impart an understanding of the importance of the Service role in conservation and management of wildlife and their habitat

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Environmental Education/ Interpretation	Egmont Key	<ul style="list-style-type: none"> • Service works with partners to educate visitors occasionally • “Discover the Island Days” • Volunteers monitoring sanctuary • Interactions with public on holiday weekends • Some kiosks • Complex public use officer provides one talk per year 	<ul style="list-style-type: none"> • Service works with partners to educate visitors regularly. • Provide regular educational events. • Increase interpretive signs/kiosks at Egmont Key. • Update and distribute Egmont Key, Tampa Bay Refuges Brochure. • Hire one full-time public use specialist. • Plan and open Egmont Key Guardhouse/Visitor Center with partner participation. • Provide occasional interpretive tours. • Tour operators conduct environmental education under special use permit conditions. 	<ul style="list-style-type: none"> • Service educates visitors routinely. • Provide routine educational events. • Increase interpretive signs/kiosks at Egmont Key. • Update and distribute Egmont Key, Tampa Bay Refuges Brochure. • Hire one full-time public use specialist. • Plan and open Egmont Key Guardhouse/Visitor Center staffed by Service and “Friends Group.” • Provide weekly interpretive tours. • Concessionaire(s) under Service contract – avenue for education.

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Fishing	Egmont Key	Occurs occasionally, no Service encouragement.	<ul style="list-style-type: none"> • Increase environmental education efforts targeting fishermen regarding marine debris, monofilament disposal. • Provide monofilament recycle containers. 	Same as Alternative B.
Wildlife Photography	Egmont Key	Occurs regularly, Service encouragement is opportunistic.	Service develops limited photography opportunities, including installation of a photo blind.	Same as Alternative B.
Wildlife Observation	Egmont Key	Occurs regularly, Service encouragement is opportunistic.	<ul style="list-style-type: none"> • Service provides an observation tower. • Provide opportunities for closed-circuit TV viewing of osprey nest or closed area/sanctuary at the Egmont Key Guardhouse/Visitor Center. 	Same as Alternative B.

Goal 4: Properly manage the refuges to meet refuge goals and objectives.

Refuge	Alternative A No-Action (Current Mgt)	Alternative B Proposed Alternative	Alternative C
Egmont Key	<ul style="list-style-type: none"> • Cooperative agreement with FPS to manage Egmont Key • Coordination between Service and FPS occurs opportunistically (meetings approximately 2/year) • Partners: <ul style="list-style-type: none"> ○ FPS ○ Tampa Bay Pilots ○ Friends of Tampa Bay ○ Tampa Bay Watch ○ National Audubon ○ St. Pete Audubon ○ Clearwater Audubon ○ Manatee Audubon ○ USGS ○ FWRI ○ FWC ○ FWS-ES ○ USF ○ Eckerd College ○ Tampa Bay Estuary Prog. ○ Pinellas County ○ Ft. Desoto County Park 	<ul style="list-style-type: none"> • Continue cooperative agreement with the state. • Facilitate transfer of USCG property to Service. • Enhance coordination between FPS and Service management teams. <ul style="list-style-type: none"> ○ Monthly telephone conferences/communications ○ Quarterly meetings • Partners <ul style="list-style-type: none"> ○ “Friends” share office/storage space with refuge staff. ○ Continue and improve relationships with partners. ○ Hold Annual Partnership Meeting. ○ Promote and support Increasing “Friends” membership to 150+ members. • Establish Service’s interest in the Pilots’ Compound property, to include acquisition of 5-acre tract, in event that occupancy changes. 	<ul style="list-style-type: none"> • Service owns/manages all of Egmont Key. • Facilitate transfer of USCG property to Service. • Partners <ul style="list-style-type: none"> ○ “Friends” share office/storage space with refuge staff. ○ Continue and improve relationships with partners ○ Hold Annual Partnership Meeting. ○ Promote and support Increasing “Friends” membership to 200-300 members. • Establish Service’s interest in the Pilots’ Compound property, to include acquisition of 5-acre tract, in event that occupancy changes.
Pinellas, Passage Key	FWS Owns/Manages	Same as Alternative A.	Same as Alternative A.

Goal 5: Protect and interpret cultural and historical resources for the benefit of future generations

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Cultural and Historical Awareness	Egmont Key	<ul style="list-style-type: none"> • Partners educate visitors regarding cultural and historical resources. • Some interpretive signs posted by partners. 	<ul style="list-style-type: none"> • Remove exotic/invasive vegetation to uncover historical resources. • Improve historical interpretive signs. • Provide occasional interpretive tours. • Establish a cooperative Visitor Center at the Egmont Key Guardhouse (FPS/Service) with cultural/historical and wildlife exhibits. • Ensure the State Unit Management Plan and the CCP are consistent. • Establish a Cultural Resources Management Unit on the northern third of the island for education and interpretation. 	<ul style="list-style-type: none"> • Remove exotic/invasive vegetation to uncover historical resources. • Improve historical interpretive signs. • Provide routine interpretive tours with dedicated public use specialist. • Establish a dedicated Service Visitor Center at the Egmont Key Guardhouse with cultural/historical and wildlife exhibits. • Establish a Cultural Resources Management Unit on the northern third of the island for education and interpretation.

Goal 6: Provide adequate staff and resources to meet refuge goals and objectives

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Staffing	Egmont Key, Pinellas, Passage Key	<ul style="list-style-type: none"> • One assistant manager • Support from nine staff 100 miles away. 	Staff dedicated to Tampa Bay Refuges located in St. Petersburg vicinity: <ul style="list-style-type: none"> • One assistant manager/LE • One full-time law enforcement officer • One biological technician • One public use specialist • One administrative office assistant – part time permanent (Listed highest priority first.)	Staff dedicated to Tampa Bay Refuges located in St. Petersburg vicinity: <ul style="list-style-type: none"> • One assistant manager • Two full-time law enforcement officers • One biological technician • One public use specialist • One administrative office assistant – full-time permanent • One maintenance person/equipment operator (Listed highest priority first.)
Funding	Egmont Key, Pinellas, Passage Key	\$120,000 (salaries and operating money)	\$450,000 (salaries and operating money)	\$900,000 (salaries and operating money)

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Facilities	Egmont Key, Pinellas, Passage Key	<ul style="list-style-type: none"> • Guard House Building – 2,560 sq. ft. (Service-owned) • Leased temporary residence (600 sq. ft.) at Pilots' Compound including tool shed/equipment shelter • Leased office with NWI—GSA lease \$5,000/year • Unlimited dock usage (boat storage free)--\$2,500/year 	<ul style="list-style-type: none"> • Guard House Building – 2,560 sq. ft. (Service-owned) • Service Dock near Pilots' Compound-- \$150,000 • Restrooms at Guardhouse/Visitor Center- - \$950,000 • Water Treatment Plant-- \$15,000 • Pursue Housing/Office Space at Pilots' Compound • Mainland Office/Storage Space (room for 4 + "Friends Group"-- 6 desks, storage)-- \$60,000/year • Boat Storage Facility on Mainland (lift at Eckerd College)-- \$13,000 • ADA Dock at Visitor Center for Ferry, handle equipment, etc. -- \$500,000 <p>(Listed highest priority first.)</p>	<ul style="list-style-type: none"> • Guard House Building – 2,560 sq. ft. (Service-owned) • Service Dock near Pilots' Compound-- \$150,000 • Restrooms at Guardhouse/Visitor Center- - \$950,000 • Water Treatment Plant-- \$15,000 • Shop/Bunk House/Office on Egmont Key-- \$750,000 • Mainland Office/Storage Space (room for 4 + "Friends Group"-- 6 desks, storage)-- \$60,000/year • Boat Storage Facility on Mainland (lift at Eckerd College)-- \$13,000 • ADA Dock at Visitor Center for Ferry, handle equipment, etc. -- \$500,000

Issues	Refuge	Alternative A No-Action (Current Mgmt.)	Alternative B Proposed Alternative	Alternative C
Equipment	Egmont Key, Pinellas, Passage Key	<ul style="list-style-type: none"> • One Law Enforcement 23' Seacraft • One Workboat 25' Whaler • One Flats Boat 20' Sundance • One SUV • One Pickup Truck • One Law Enforcement ATV • One 6-Passenger Club Cart (used to transport VIPs, volunteers) • One 4x6 John Deere Gator Utility Vehicle • One 4WD Mule 	<ul style="list-style-type: none"> • One Law Enforcement 23' Seacraft • One Pacman 30' (replaces Workboat)-- \$150,000 • One Flats Boat 20' • One SUV • Two Pickup Trucks • Two ATVs • One 6-Passenger Club Cart (used to transport VIPs, volunteers) • One 4WD Mule • One 4WD Front End Loader-- \$75,000 	<ul style="list-style-type: none"> • One Law Enforcement 23' Seacraft • One Pacman 30' (replaces Workboat)-- \$150,000 • One Work Barge • One Flats Boat 20' • Five Vehicles (Heavy-Duty Pickup Truck) • Two ATVs • One 6-Passenger Club Cart (used to transport VIPs, volunteers) • Two 4WD Mules • One 4WD Tractor-- \$45,000 • One 4WD Front End Loader-- \$75,000

IV. Environmental Consequences

OVERVIEW

This section analyzes and discusses the potential environmental effects or consequences that can be reasonably expected by the implementation of each of the three alternatives described in Chapter III of this EA. For each alternative, the expected outcomes are portrayed through the 15-year life of the CCP.

EFFECTS COMMON TO ALL ALTERNATIVES

A few potential effects will be the same under each alternative and are summarized under seven categories: environmental justice, climate change, other management, land acquisition, cultural resources, refuge revenue-sharing, and other effects.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities with access to public information and opportunities for participation in matters relating to human health or the environment.

None of the management alternatives described in this environmental assessment will disproportionately place any adverse environmental, economic, social, or health impacts on minority and low-income populations. Implementation of any action alternative that includes public use and environmental education is anticipated to provide a benefit to the residents residing in the surrounding communities.

CLIMATE CHANGE

The U.S. Department of the Interior issued an order in January 2001 requiring federal agencies under its direction that have land management responsibilities to consider potential climate change impacts as part of long-range planning endeavors.

The increase of carbon within the earth's atmosphere has been linked to the gradual rise in surface temperatures commonly referred to as global warming. In relation to comprehensive planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact to be considered in planning. The U.S. Department of Energy's *Carbon Sequestration Research and Development* (U.S. Department of Energy 1999) defines carbon sequestration as "...the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

The land is a tremendous force in carbon sequestration. Terrestrial biomes of all sorts—grasslands, forests, wetlands, tundra, perpetual ice, and desert—are effective both in preventing carbon emissions and in acting as a biological “scrubber” of atmospheric carbon monoxide. The conclusions of the Department of Energy’s report noted that ecosystem protection is important to carbon sequestration and may reduce or prevent the loss of carbon currently stored in the terrestrial biosphere.

Conserving natural habitat for wildlife is the heart of any long-range plan for national wildlife refuges. The actions proposed in this Draft CCP/EA would conserve or restore land and water, and would thus enhance carbon sequestration. This, in turn, contributes positively to efforts to mitigate human-induced global climate changes.

OTHER MANAGEMENT

All management activities that could affect the refuge’s natural resources, including utility lines and easements, soils, water and air, and historical and archaeological resources, would be managed to comply with all laws and regulations. In particular, any existing and future oil and gas exploration, extraction, and transport operations on the refuge would be managed identically under each of the alternatives. Thus, the impacts would be the same.

LAND ACQUISITION

Funding for land acquisition from willing sellers within the approved acquisition boundary of the Tampa Bay Refuges would come from the Land and Water Conservation Fund, the Migratory Bird Conservation Fund, Corps mitigation programs, or donations from conservation and private organizations. Conservation easements and leases can be used to obtain the minimum interests necessary to satisfy refuge objectives if the staff can adequately manage uses of the areas for the benefit of wildlife. The Service can negotiate management agreements with local, state, and federal agencies, and accept conservation easements. Some tracts within the acquisition boundaries may be owned by other public or private conservation organizations. The Service would work with interested organizations to identify additional areas needing protection and provide technical assistance if needed. The acquisition of private lands is entirely contingent on the landowners and their willingness to participate.

CULTURAL RESOURCES

All alternatives afford additional land protection and low levels of development, thereby producing little negative effect on cultural and historic resources. Potentially negative effects could include construction of new facilities and associated utilities. In most cases, these management actions would require review by the Service’s Regional Archaeologist in consultation with the State of Florida Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. Therefore, the determination of whether a particular action within an alternative has the potential to affect cultural resources is an on-going process that would occur during the planning stages of every project.

Service acquisition of land with known or potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a federal agency which may affect archaeological or historical resources be reviewed by the State Historic Preservation Office, and that the identified effects must be avoided or mitigated. The Service’s policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Land acquisition by the Service, within the current acquisition boundary, would provide some degree of protection to significant cultural and historic resources. If acquisition of private lands does not occur and these lands remain under private ownership, the landowner would be responsible for protecting and preserving cultural resources. Development of off-refuge lands has the potential to destroy archaeological artifacts and other historical resources, thereby decreasing opportunities for cultural resource interpretation and research.

REFUGE REVENUE-SHARING

Annual refuge revenue-sharing payments to Hillsborough, Pinellas, and Manatee Counties would continue at similar rates under each alternative. If lands are acquired and added to the refuge, the payments would increase accordingly.

OTHER EFFECTS

Each of the alternatives would have similar effects or minimal to negligible effects on soils, water quantity, noise, transportation, human health and safety, children, hazardous materials, and aesthetic and visual resources.

SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative. The terms “regular” and “routine,” or “regularly” and “routinely,” are used throughout this summary. In general, the terms “regular” and “regularly” refer to activities performed approximately twice per month as personnel can get to them. The terms “routine” or “routinely” refer to activities that are scheduled and occur approximately once per week, the exception being in the description of prescribed fire and beach renourishment. Table 17 summarizes and addresses the likely outcomes for the specific issues, and is organized by broad issue categories.

Alternative A – Current Management (No Action Alternative)

In general, implementing Alternative A, the No Action Alternative, would have neutral to mildly beneficial impacts on the human environment, wildlife populations, and wildlife habitat. Beach erosion would continue to be a considerable threat to the piping plover and sea turtle habitat because routine beach renourishment would not occur. Public use opportunities provided by the Service would predominantly occur on an opportunistic basis, as would predator and invasive vegetation control and law enforcement.

Water Quality

The Corps dredges nearby channels in the Tampa Bay area and must dispose of the dredged material. That material can be used beneficially to renourish refuge beaches that have erosion issues. Beach renourishment activities currently occur periodically on the northwestern side of Egmont Key NWR. When the dredged material is being placed, a temporary increase in water turbidity would occur. Depending on the composition of the material being placed, increased turbidity could reduce dissolved oxygen, limit sunlight penetration, and otherwise have a negative effect on aquatic organisms until the turbidity returned to normal levels. The temporary negative impacts would be offset by beach habitat improvement that would benefit shorebirds and sea turtles, particularly the threatened piping plover and Atlantic loggerhead sea turtle. Also renourishment counters erosion that undermines the cultural resources of Fort Dade.

Erosion control activities that are conducted opportunistically on Pinellas NWR help reduce the amount of sediment entering the water. Opportunistic cleanup of monofilament line and trash and education regarding proper disposal of these items help prevent and reduce water pollution.

Native Habitat

The No Action Alternative would have a neutral to positive impact on native habitat. Currently, control of exotic and invasive vegetation, erosion control, and conservation of habitats occur on an opportunistic basis. Therefore certain bird habitats and gopher tortoise habitat could be decreased due to encroachment of invasive species if not kept under control. Pinellas and Passage Key NWRs, the southern end of Egmont Key NWR, and the vessel exclusion zone on the east side of Egmont Key NWR are closed to the public to protect habitat and wildlife. Law enforcement, education, and signs help prevent human disturbance of native habitat, but law enforcement would only be present on the refuge on holiday weekends or on an opportunistic basis, and educational programs would occur irregularly. Beach renourishment would only occur on an irregular basis, focusing on the public use areas of Egmont Key NWR instead of the entire island and Passage Key NWR. Tampa Bay Refuges' personnel, in coordination with their partners, would continue to support the County Oil Spill Response Plan to reduce or eliminate negative impacts to habitat that could occur in the event of an oil spill.

Wildlife Populations

The No Action Alternative would have a neutral to positive impact on wildlife populations. Currently bird surveys are conducted monthly when able, and annual peak nesting surveys are also conducted. Little to no research is done. More comprehensive monitoring, surveying, and researching of native wildlife would allow the Service and partners to identify trends in populations and diversity, which would help the Service to make better management decisions.

Improving habitat diversity and size would have a positive impact on wildlife populations. However, placement of dredged material during beach renourishment could smother invertebrates and make this food source temporarily unavailable to shorebirds. This situation would be expected to be temporary, but would need to be monitored to ensure the food source is recovered. Frequency of beach renourishment would be based on the ability of the invertebrates to recover. Pinellas and Passage Key NWRs, the southern end of Egmont Key NWR, and the vessel exclusion zone on the east side of Egmont Key NWR are closed to the public to protect habitat and wildlife. Law enforcement, education, and signs help prevent human disturbance of wildlife, but law enforcement would only be present on Egmont Key NWR on holiday weekends or on an opportunistic basis, and educational programs would occur irregularly.

Seasonally, certain beach areas on Egmont Key NWR would be closed to reduce human disturbance of nesting shorebirds and their young. Sea turtle nests would also be identified and posted to prevent disturbance. Fallen palm trees on Egmont Key NWR can be impassible barriers to nesting sea turtles and their offspring. The Service would remove these fallen trees on an opportunistic basis—if staff were on site and saw the fallen tree, the tree would be removed as staff was available.

Predator control by the Service, conducted opportunistically, would help protect wildlife on the refuges. Opportunistic cleanup of monofilament line and trash and education regarding proper disposal of these items would also help protect wildlife by reducing the chance of entanglement or ingestion of the material.

Tampa Bay Refuges' personnel, in coordination with their partners, support the County Oil Spill Response Plan to reduce or eliminate negative impacts to wildlife that could occur in the event of an oil spill. The Service, if needed, would coordinate with partners to rescue animals coated in oil.

Wilderness Area

The No Action Alternative would have a neutral or possibly a negative impact on the wilderness area, Passage Key NWR. The island is closed to the public to prevent wildlife disturbance. Passage Key NWR is an intermittent island that is not managed in any way currently. If the beach is not renourished, the island could disappear at some point and not return.

Cultural and Historical Resources

The No Action Alternative would have a neutral or possibly negative impact on the cultural and historical resources on Egmont Key NWR. Fort Dade and the Egmont Key Lighthouse were listed on the National Register of Historic Places in 1978. Erosion, encroaching vegetation, vandalism, unpermitted artifact collection, and other destructive human behavior have caused or could cause damage to the structures. Beach renourishment, focusing on the north end of Egmont Key NWR, would occur irregularly, but would offset some of the erosion undermining the structures. Service law enforcement officers would only be on-site holiday weekends, and on an opportunistic basis to help prevent human disturbance of Egmont Key NWR resources. Partners currently educate visitors regarding the cultural and historical resources on Egmont Key NWR, and there are some interpretive signs posted regarding Fort Dade.

Public Use

Since refuge lands are held in the public trust by the Service, access is generally allowed for compatible, priority wildlife-dependent public uses unless federal trust resources would be impacted, or the activities would detract from achieving refuge purposes or the Refuge System mission, or because administrative resources are not available to ensure a safe, quality experience. Egmont Key NWR is currently open to the following priority wildlife-dependent public uses: environmental education and interpretation, wildlife observation, wildlife photography, and some people surf fish from the shores of the island. Other popular activities allowed in open areas of Egmont Key NWR are swimming, sunbathing, and picnicking.

The No Action Alternative would have a positive impact on public use on Egmont Key NWR. The Service works with partners to provide environmental education opportunities such as “Discover the Island Days,” interactions with the public on holiday weekends when Service personnel are on the refuge, and approximately one time per year the Chassahowitzka NWR Complex public use staff provides a talk for visitors. Wildlife observation and wildlife photography occurs regularly with only opportunistic encouragement from the Service.

Socioeconomic Resources

In 2003, there were 39,580,000 visitors to national wildlife refuges. An economic impact analysis of the effects of ecotourism on communities surrounding national wildlife refuges highlights the substantial benefits visitors bring to the local economy (Laughland and Caudhill 1997). Ecotourism dollars generated, which included lodging, meals, gasoline, and ancillary purchases, were in the millions.

Under the No Action Alternative, no change of current conditions would occur. Currently, only one full-time refuge staff member is stationed locally.

Alternative B – Enhance Current Programs (Proposed Alternative)

Alternative B, the proposed alternative, would be expected to result in greater net positive environmental benefits than Alternative A, the no action alternative. Control of exotic and invasive species and habitat improvement through regular use of prescribed fire and/or herbicides would occur under Alternative B. Beach renourishment would occur on a regular or routine basis and would be better coordinated and comprehensively addressed to benefit wildlife, cultural resources, and public

use on Egmont Key NWR, and would be considered to rebuild Passage Key NWR. Service law enforcement would have a greater presence, environmental education and interpretation opportunities would increase, wildlife observation and wildlife photography would be promoted by the Service, and predator control would occur on a regular and as needed basis.

Air Quality

Prescribed fire, used to control exotic and invasive vegetation and to promote vegetative diversity, is not currently used on the refuges. Under the proposed alternative, prescribed fire would be used on a regular basis for habitat management on Egmont Key NWR. Minor, very short-term negative air quality impacts could be experienced during controlled burns. However, the temporary negative impacts are offset by the positive impacts. Prescribed fire would improve and expand desired habitat for birds and gopher tortoises. In addition, by eliminating the tinder and underbrush that would be susceptible to a wildfire, prescribed fire would help prevent the loss of cultural resources, Service equipment, and the FPS and Pilots Compound facilities that could be caused by an uncontrolled fire.

Water Quality

Beach renourishment would be coordinated directly between the Service and the Corps. A long-term comprehensive plan would be developed for renourishment on a regular basis that would consider the entirety of Egmont Key NWR. Renourishment of Passage Key NWR would be evaluated and a decision would depend on compatibility with Service requirements for wilderness areas. Expanding the beach area that would be renourished would temporarily increase water turbidity over a broader area than under Alternative A. Increased turbidity could reduce dissolved oxygen, limit sunlight penetration, and otherwise have a negative effect on aquatic organisms until the turbidity returned to normal levels. The temporary negative impacts would be offset by improved and increased beach habitat, restoration of the island(s), and protection of cultural resources.

Erosion control activities on Pinellas NWR described under Alternative A would be implemented as needed instead of on an opportunistic basis. In addition, the Service, working with partners, would implement an idle speed zone between Little Bird Key and the nearby sea wall to reduce wake-induced erosion. These activities would reduce water turbidity caused by erosion, and protect the islands. Regular cleanup of monofilament line and trash and education regarding proper disposal of these items would further help prevent and reduce water pollution than doing it opportunistically as described under Alternative A.

During construction of proposed facilities on Egmont Key NWR (e.g., dock, public restrooms, utilities, and ADA-compliant commercial dock at Visitor Center), best management practices would be utilized to minimize erosion and sedimentation impacts that could be caused by ground disturbance. Design and construction of these facilities would meet all appropriate federal and state regulations/codes, and to the extent feasible, green construction incorporating environmental materials and design would be utilized. Use of flushless or low-flow water faucets and toilets would be considered. Once the restrooms are operational, public use of these facilities would be expected to reduce the amount of human waste improperly disposed of that could impact water quality during rain events.

Native Habitat

The proposed alternative would have a positive impact on native habitat. Control of exotic and invasive vegetation, erosion control, and conservation of habitats would occur on a regular, or as needed basis. Use of prescribed fire on Egmont Key NWR would create a more diverse and expanded native habitat. Gopher tortoise habitat would be expected to double or quadruple from approximately 50 acres to 100-200 acres by regular use of prescribed fire. The same areas closed to the public in Alternative A would remain closed to protect habitat and wildlife. Two Service law enforcement officers (one of which would be a collateral duty officer) would be stationed locally and

law enforcement activities at the refuges would be conducted daily. Refuge staff would explore the possibility of extending Service law enforcement jurisdiction around Egmont Key NWR to beyond mean high tide, and to add a submerged lands lease similar to Tarpon Key for the other Pinellas NWR islands. The number of signs designating closed areas would be increased and maintained as needed, and the Service would provide more educational opportunities through kiosks and seasonal opportunities at the proposed Egmont Key Guard House/Visitor Center. Comprehensive beach renourishment and other erosion control activities described under the water quality section for the proposed alternative would provide greater protection of habitats than those described for the no action alternative. Tampa Bay Refuges' personnel, in coordination with their partners, would support the County Oil Spill Response Plan in the same manner as in the no action alternative.

Under the proposed alternative, the Service, in cooperation with partners, would conduct surveys to identify, map, and protect state-listed plant species on the refuges. The Service would move the vessel exclusion zone on the east side of Egmont Key NWR further out from the island and create a straight line boundary for easier recognition of the zone. The vessel exclusion zone protects submerged aquatic vegetation, which is habitat and food for various aquatic species, including the endangered West Indian manatee. The Service would also facilitate transfer of the USCG property on Egmont Key to the Service, and establish an understanding with the Tampa Bay Pilots Association that if their property is vacated, the Service would like to gain ownership of the property. Consolidating all property on Egmont Key under the Service would help in comprehensively managing the island for wildlife and habitat protection and public use.

Wildlife Populations

The proposed alternative would have a positive impact on wildlife populations. Under this alternative, a biological technician would be hired to conduct the bird surveys and to control predators on a regular and as needed basis. Bird surveys would be led and conducted by the Service monthly, and peak nesting surveys would be continued. Additional surveys would be coordinated with partners and the Service would participate in regional, national, and international surveys, such as the International Shorebird Survey, the Audubon Christmas Bird Count, and the International Piping Plover Survey. Research would be done opportunistically. The Service would lead sea turtle and piping plover monitoring with its partners, and would initiate gopher tortoise monitoring and research. The increased monitoring, surveying, and researching of native wildlife would allow the Service and partners to identify trends in populations and diversity, which would help the Service to make better management decisions.

Improving habitat diversity and increasing the size of species habitats would have a positive impact on wildlife populations. However, placement of the dredged material over a broader area during beach renourishment could negatively impact a greater percentage of the invertebrate population on which shorebirds depend for food. The frequency and location of material placement could be staggered to alleviate impacts as needed. This situation would be expected to be temporary, but would need to be monitored to ensure that the food source is recovered. The same areas closed to the public in Alternative A would remain closed to protect habitat and wildlife. Law enforcement would occur on a daily basis, seasonal education opportunities would occur regularly, and more signs would be posted and maintained to help prevent human disturbance of wildlife. The proposed new Egmont Key Guard House and Visitor Center would provide environmental and cultural and historical education opportunities.

Seasonally, certain beach areas on Egmont Key NWR would be closed to reduce human disturbance of nesting shorebirds and their young, and sea turtle nests would also be identified and posted to prevent disturbance in the same manner as in the no action alternative. The Service would remove fallen palm trees on an as needed basis to eliminate the barriers for sea turtles and their young.

Predator control by the Service would be conducted on a regular and as needed basis to protect wildlife on the refuges. Regular cleanup of monofilament line and trash and education regarding proper disposal of these items would better protect wildlife than conducting these activities opportunistically as proposed under the no action alternative.

Tampa Bay Refuges' personnel, in coordination with their partners, would continue to support the County Oil Spill Response Plan to reduce or eliminate negative impacts to wildlife that could occur in the event of an oil spill. The Service, if needed, would coordinate with partners to rescue animals coated in oil.

Wilderness Area

Under the proposed alternative, the Service would attempt to restore and maintain Passage Key NWR. Use of erosion controls, such as a bulk head barrier, would be considered. If these actions were not taken, Passage Key NWR could disappear forever.

Cultural and Historical Resources

The proposed alternative would have a positive impact on the cultural and historical resources on Egmont Key NWR. Comprehensive beach renourishment on a regular basis would help prevent erosion that could undermine the historic structures. Regular prescribed fire or herbicide application would control encroaching vegetation. Law enforcement conducted on a daily basis would counter vandalism, unpermitted artifact collection, and other destructive human behavior that could cause additional damage to the structures. The Service would also improve and increase the number of historical interpretive signs around the Fort Dade site. In addition, the Service would establish a cooperative Visitor Center at the Egmont Key Guard House with the FPS, which would have cultural, historical, and wildlife exhibits. The Service would provide occasional interpretive tours, and would establish a Resource Management Unit on the northern end of Egmont Key NWR for education and interpretation.

Public Use

The proposed alternative would have a greater positive impact on public use on Egmont Key NWR than the no action alternative. The Service would plan and open the Egmont Key Guard House and Visitor Center with partners, which would provide wildlife, cultural, and historical exhibits. The Service would hire one full-time public use specialist to manage the activities on Egmont Key NWR. Educational opportunities would be provided on a regular basis, and interpretive tours would be provided occasionally. Tour operators who bring people to Egmont Key NWR would do so under a special use permit with the Service to control the number of visitors to the island. Under the special use permit, the operators would be required to conduct environmental education related to the refuge. The wildlife, cultural, and historical interpretive signs and kiosks would be improved, and an increased number would be placed on Egmont Key NWR. The Egmont Key and Tampa Bay Refuges brochure would be updated and distributed to the public.

The Service would install a public-access observation tower for wildlife viewing. Closed-circuit television viewing of wildlife, such as an osprey nest or rearing of young in the bird sanctuary or other closed area, would be provided from the Visitor Center. The Service would also develop limited photography opportunities, including access to a new photography blind, through special use permits.

Socioeconomic Resources

Under Alternative B, the number of visitors would be expected to increase due to the enhanced public use opportunities on Egmont Key NWR. Opening of the Egmont Key Guard House and Visitor Center, increasing education and interpretation opportunities, improving signage, constructing the observation

tower, and promoting other photography and observation opportunities would attract more people to the refuge. Therefore, the local economy would benefit through increased visitor spending.

In addition, increasing the refuge staff by three and one-half positions, and stationing the staff locally, would also contribute to the local economy through personal spending and work-related purchases.

Alternative C – Service Manages all of Egmont Key and Expands Programs

Alternative C would be an enhancement of Alternative B, the proposed alternative, because Service programs would be expanded even further. Alternative C would be expected to result in greater net positive environmental benefits than either Alternative A, the no action alternative, or Alternative B, the proposed alternative. Under Alternative C, the Service would own and manage all of Egmont Key. An overlay State Park managed by FPS would no longer exist. This would allow for comprehensive wildlife, habitat, and public use management of the island with a singular mission. Many of the management activities would occur more frequently and some additional activities would be included under Alternative C.

Air Quality

Like Alternative B, Alternative C would use prescribed fire to control exotic and invasive vegetation and to improve and increase native habitat. Under Alternative C, prescribed fire would be used more frequently on a routine basis versus on a regular basis. Therefore the short-term negative air quality impacts would occur more frequently. The benefits would be in maintaining the preferred native habitat and habitat diversity, while reducing the risk of an uncontrolled wildfire.

Water Quality

Under Alternative C, erosion control on the refuges, including beach renourishment and introduction of the idle speed zone near Little Bird Key, would be addressed the same way as under Alternative B. Cleanup of monofilament and trash and education regarding proper disposal of these items would occur more frequently, on a routine basis.

Under Alternative C, more facilities would be constructed on Egmont Key (e.g., dock, public restrooms, utilities, ADA-compliant commercial dock at Visitor Center, and a shop/office/bunkhouse). During construction of all of these facilities, best management practices would be utilized to minimize erosion and sedimentation impacts to surface water. Design and construction of these facilities would meet all appropriate federal and state regulations/codes, and to the extent feasible, green construction, incorporating environmental materials and design, would be utilized. Use of flushless or low-flow water faucets and toilets would be considered.

Native Habitat

Under Alternative C, control of exotic and invasive vegetation and conservation of habitats would occur on a routine basis, while erosion control would occur on a regular schedule or as needed basis as described for Alternative B. Routine use of prescribed fire on Egmont Key NWR, under Alternative C, would better maintain the expanded and diverse habitat created by controlled burns than either Alternative A or B. Gopher tortoise habitat would be maintained at 100-200 acres. The same areas closed to the public in Alternatives A and B would remain closed to protect habitat and wildlife. Two full-time Service law enforcement officers would be stationed locally and law enforcement would have an even greater presence than under Alternative B, where one of the officers would be a collateral duty officer. Expansion of the Service law enforcement jurisdiction would be explored and the number of signs designating closed areas would be increased and maintained as described under Alternative B. However, under Alternative C, educational

opportunities would be provided daily, and year-round instead of seasonally. Like Alternatives A and B, Tampa Bay personnel would continue to support the County Oil Spill Response Plan.

Under Alternative C, the Service would conduct the surveys to identify, map, and protect state-listed plant species on the refuges. Under Alternative C, the Service would adjust the vessel exclusion zone on the east side of Egmont Key NWR, and work towards consolidating Egmont Key property under the Service as described for Alternative B.

Wildlife Populations

Like the proposed alternative, under Alternative C a biological technician would be hired to conduct the bird surveys and to control predators on a regular and as needed basis. Research would be conducted to expand the knowledge base of the native species. The Service, with its partners, would monitor sea turtles (during the summer) and piping plovers on a daily basis, and gopher tortoises would be monitored routinely. The Service would continue to lead the monthly surveys and expand them as described under Alternative B.

Improving, protecting, and maintaining habitats on a routine basis under Alternative C would have a greater beneficial impact on wildlife than described for the other two alternatives. Like Alternative B, under Alternative C beach areas on Egmont Key NWR would be closed seasonally to protect nesting shorebirds and their young, sea turtle nests would be protected, and fallen palm trees would be removed on an as needed basis.

Cleanup of monofilament line and trash would occur routinely. Refuge personnel would support the County Oil Spill Response Plan and would coordinate with partners to rescue animals as described under Alternative B.

Wilderness Area

Actions under Alternative C would be the same as under Alternative B.

Cultural and Historical Resources

Alternative C would improve upon the positive impacts of Alternative B by routinely using prescribed fire or herbicide application to control vegetation encroaching on historical structures, increasing the law enforcement presence at Egmont Key NWR by hiring two full-time officers, providing routine interpretive tours, and by having dedicated Service personnel managing the proposed Visitor Center and Cultural Resources Management Unit.

Public Use

Alternative C would improve upon the positive impacts of Alternative B by providing educational opportunities daily instead of regularly. Weekly interpretive tours would be provided for visitors, and concessionaires under Service contract would be another avenue for environmental education. The wildlife observation and wildlife photography opportunities described in Alternative B, including the addition of a photography blind on Egmont Key NWR, would be available to the public.

Socioeconomic Resources

Alternative C would further enhance the public use opportunities on Egmont Key NWR, and therefore even more visitors would be expected. The Service staffing would add five and one-half positions, which would allow for more frequent and year-round education and interpretation opportunities. Increased education and interpretation opportunities and the addition of a photo blind would attract more visitors. All refuge staff positions would be stationed locally, which would also contribute to the local economy.

Table 17. Summary of environmental effects by alternative, Tampa Bay Refuges

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Predation	Predators, including rats, raccoons, and fish crows, would continue to be a problem. Birds would not likely re-inhabit Tarpon Key and wildlife populations would either remain the same or decline over the 15-year life of the CCP.	Predator control on a regular and as needed basis would promote increases in trust species and other native wildlife, and inhabitation of Tarpon Key. Hiring of biological technician would ensure consistency and enable refuge staff to address other projects.	Same as Alternative B.
Illegal Access/Human Disturbance, Trespassing	Illegal access and human disturbance of wildlife and habitat would probably increase as the local population increases.	Illegal access and human disturbance of wildlife and habitat would probably decrease because of daily law enforcement by one full-time officer and one collateral duty officer, possible extension of the Service law enforcement jurisdiction, creation of an idle speed zone near Little Bird Key, and seasonal educational opportunities.	Illegal access and human disturbance of wildlife and habitat would probably be decreased even more because of daily law enforcement by two full-time officers, possible extension of the Service law enforcement jurisdiction, creation of an idle speed zone near Little Bird Key, and year-round daily educational opportunities.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Erosion	By conducting irregular beach renourishment exclusively on the north end of Egmont Key NWR, erosion would go unchecked in other areas of the refuge and at Passage Key NWR. Erosion on Pinellas NWR would probably not increase or decrease, but would probably continue.	Scheduled, comprehensive beach renourishment on Egmont Key and Passage Key NWRs would reduce the impacts of erosion on these islands. Installation of erosion control at Passage Key NWR would help reduce erosion. Implementation of erosion control measures on an as needed basis and the creation of an idle speed zone near Little Bird Key would reduce erosion at Pinellas NWR.	Same as Alternative B.
Exotic/Invasive Vegetation	Exotic and invasive plant species would continue to spread, particularly on Egmont Key NWR, degrading native habitats and displacing native species, while generally having adverse effects on native wildlife.	Control of exotics/invasives on a regular basis through prescribed fire/herbicides would reduce the spread of the exotics/invasives and their associated adverse effects.	Control of exotics/invasives on a routine basis through prescribed fire/herbicides would eliminate the spread of the exotics/invasives and their associated adverse effects.
Improper Disposal of Monofilament Line and Trash	Improperly disposed fishing line and trash would likely increase as the local population increases.	Cleanup and education conducted on a regular basis would reduce the amount of improperly disposed material.	Cleanup and education conducted on a routine basis would further reduce the amount of improperly disposed material.
Oil Spills	The Service would coordinate with partners and fully support the County Oil Spill Response Plan.	Same as Alternative A.	Same as Alternative A.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Atlantic Loggerhead Sea Turtle – Threatened	Sea turtle protection and monitoring, opportunistic erosion control of beach habitat, and opportunistic removal of fallen palm trees would continue. Sea turtle numbers would not likely increase or decrease.	Sea turtles would be better protected (daily law enforcement, increased educational opportunities), beach renourishment would occur routinely, and fallen palm trees would be removed as needed. Service would lead and coordinate monitoring. Sea turtle populations would likely benefit from the proposed actions.	Same as Alternative B, but Service and partners would monitor the turtles daily during the summer. Improved data/information regarding sea turtles would improve refuge management decisions.
Piping Plover - Threatened	Erosion control of beach habitat would occur opportunistically, and the piping plover would continue to be surveyed during routine refuge bird surveys, and every five years during the international survey as staff is able. Piping plover numbers would not likely increase or decrease.	Beach renourishment would occur routinely, and the Service would lead the bird surveys and coordinate additional surveys with partners. Piping plover populations would likely benefit from the proposed actions.	Same as Alternative B, but Service and partners would monitor the piping plovers daily. Improved data/information regarding piping plovers would improve refuge management decisions.
West Indian Manatee - Endangered	The vessel exclusion zone protects the submerged aquatic vegetation on the east side of Egmont Key NWR, which is suitable habitat for the manatees. Manatee numbers would not likely increase or decrease.	The vessel exclusion zone would be moved further out from shore and the boundary line straightened for easier recognition of the zone. Manatee numbers would not likely increase or decrease.	Same as Alternative B.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Gopher Tortoises	Monitoring of gopher tortoises is done opportunistically and current gopher tortoise habitat is approximately 50 acres. The gopher tortoise population would likely remain the same.	Monitoring and research would be conducted and gopher tortoise habitat would increase to 100-200 acres through prescribed fire. The gopher tortoise population would likely increase.	Same as Alternative B, but monitoring and research would be conducted routinely to improve management decisions.
State-Listed Plant Species (One species proposed for listing.)	Exotic and invasive plant species would continue to spread, particularly on Egmont Key NWR, degrading native habitats and displacing state-listed species.	Surveys would be conducted through partnerships to identify and map state-listed plant species on the refuges. Identified species would be protected. Exotic/invasive vegetation would be controlled regularly.	Same as Alternative B, but Service would conduct the surveys, and exotic/invasive vegetation would be controlled routinely.
Bird Surveys	Current surveys are conducted regularly when able. Management decisions are based on gathered data.	Monthly surveys would be conducted, and additional surveys would be coordinated. A biological technician would be hired to conduct surveys. Better management decisions would be made based on improved database.	Same as Alternative B, but research would also be conducted. Even better decisions could be made based on better information.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Environmental Education/Interpretation	Educational opportunities provided occasionally. Some interpretive signs placed on Egmont Key NWR.	Environmental education and interpretation opportunities would improve. The Egmont Key Guard House/Visitor Center would open, staffed by Service and partners. One full-time public use specialist would be hired. Regular educational opportunities would be provided. Interpretive signs would be increased and improved, and occasional interpretive tours would be provided. A new refuge brochure would be distributed, and tour operators would also conduct environmental education programs.	Same as Alternative B, but the Service and its “Friends Group” would staff the Egmont Key Guard House/Visitor Center, and would provide educational opportunities routinely, on a daily basis year-round. Weekly interpretive tours would be provided, and concessionaire(s) under Service contract would be an additional avenue for environmental education.
Wildlife Photography	Service/partners promote or encourage wildlife photography on an opportunistic basis.	Service would provide photography opportunities under special use permits.	Same as Alternative B, but the Service would also install a photo blind for public use.
Wildlife Observation	Service/partners promote or encourage wildlife observation on an opportunistic basis.	Service would promote wildlife observation by constructing an observation tower on Egmont Key NWR, and by providing closed-circuit TV viewing of wildlife from the Egmont Key Guard House/Visitor Center.	Same as Alternative B.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B (Enhance Current Programs -- Proposed Alternative)	Alternative C (FWS Manages of of Egmont Key and Expands Programs)
Cultural and Historical Resources	Public awareness of cultural and historical resources on the refuge would remain the same. Partners educate visitors and some interpretive signs have been posted on Egmont Key NWR. Service law enforcement is on site during holiday weekends and when able.	Public awareness would improve through increased education and interpretation. The Visitor Center would have cultural/historical exhibits, interpretive tours would be provided occasionally, and the interpretive signs would be improved and maintained. Protection of the resources would improve through increased law enforcement and regular removal of exotic/invasive vegetation from the cultural/historical structures. A Cultural Resource Management Unit would also be established on Egmont Key NWR.	Same as Alternative B, but the Visitor Center and Cultural Resource Management Unit would be managed by the Service (not cooperatively); interpretive tours would be offered routinely; law enforcement would be more prevalent; and exotic/invasive vegetation would be removed from structures on a regular basis.

UNAVOIDABLE IMPACTS AND MITIGATION MEASURES

Under Alternative A, the No Action Alternative, there are numerous unavoidable impacts, including law enforcement that is not adequate for protecting any significant visitor use; continued degradation of the biological functions of native plant communities and wildlife habitat due to the invasion of exotic plants and nuisance animals; and a continued decrease in biodiversity. Over time, if these issues are not addressed, they would continue to impact refuge resources.

Alternative B, the proposed alternative, also has some unavoidable impacts. These impacts are expected to be minor and/or short-term in duration. However, the refuge would attempt to minimize these impacts whenever possible. The following sections describe the measures the refuge would employ to mitigate and minimize the potential impacts that would result from implementation of the proposed alternative.

WATER QUALITY FROM SOIL DISTURBANCE AND USE OF HERBICIDES

Soil disturbance and siltation due to road maintenance; and the construction of the docks, restrooms, water treatment plant, and an observation tower are expected to be minor and of short duration. To further reduce potential impacts, the refuge personnel will use best management practices to minimize the erosion of soils into water bodies.

Long-term herbicide use for exotic plant control could result in a slight decrease in water quality in areas prone to exotic plant infestation. Through the proper application of herbicides, however, this is expected to have a minor impact on the environment, with the benefit of reducing or eliminating exotic plant infestations.

WILDLIFE DISTURBANCE

Disturbance to wildlife is an unavoidable consequence of any public use program, regardless of the activity involved. While some activities such as wildlife observation may be less disturbing than others, all of the public use activities proposed under the proposed alternative would be planned to avoid unacceptable levels of impact.

The known and anticipated levels of disturbance from the proposed alternative are not considered to be significant. Nevertheless, the refuge would manage public use activities to reduce impacts. General wildlife observation and wildlife photography may result in minimal disturbance to wildlife. If the refuge personnel determine that impacts from the expected additional visitor uses are above the levels that are anticipated, those uses would be discontinued, restricted, or rerouted to other less sensitive areas.

VEGETATION DISTURBANCE

Negative impacts could result from the creation, extension, and maintenance of trails that require the clearing of nonsensitive vegetation along its length. This would be expected to be a minor short-term impact.

USER GROUP CONFLICTS

As public use increases, unanticipated conflicts between different user groups could occur. If this should happen, personnel would adjust programs, as needed, to eliminate or minimize any public use issues. Methods would be used that have proven to be effective in reducing or eliminating public use

conflicts. These methods include establishing separate use areas, different use periods, and limits on the numbers of users in order to provide safe, quality, appropriate, and compatible wildlife-dependent recreational opportunities.

EFFECTS ON NEARBY LANDOWNERS

Implementation of the proposed alternative is not expected to negatively affect the owners of nearby private lands. Positive impacts that would be expected include higher property values and increased opportunities for viewing more diverse wildlife.

LAND OWNERSHIP AND SITE DEVELOPMENT

Land acquisition efforts by the Service could lead to changes in land use and recreational use patterns. However, most of the non-Service-owned lands within the refuges' approved acquisition boundaries would retain their current use. If these lands are acquired, they would be maintained and managed for native wildlife populations, and opened to wildlife-compatible public uses, where feasible.

Potential development of the refuge's buildings, docks, observation tower, and other improvements could lead to minor short-term negative impacts on plants, soils, and some wildlife species. When building the observation towers, efforts would be made to use recycled products and environmentally sensitive treated lumber. All construction activities would comply with the requirements of Section 404 of the Clean Water Act; the National Historic Preservation Act; Executive Order 11988, Floodplain Management; and other applicable regulatory requirements.

CUMULATIVE IMPACTS

A cumulative impact is defined as an impact on the natural or human environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can "accumulate" spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other's effect on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource. In addition, sometimes the overall effect is greater than merely the sum of the individual effects, such as when one more reduction in a population crosses a threshold of reproductive sustainability, and threatens to extinguish the population.

A thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum; there are virtually always some other actions that have affected that resource in some way in the past, or are affecting it in the present, or will affect it in the reasonably foreseeable future. So any assessment of a specific action's effects must in fact be made with consideration of what else has happened to that resource, what else is happening, or what else will likely happen to it.

Refuge personnel are not aware of any past, present, or future planned actions that would result in a significant cumulative impact when added to the refuges' proposed actions, as outlined in the proposed alternative.

However, if the number of visitors increase due to increased public use opportunities and growth of the local population who have easy access to Egmont Key NWR, the cumulative impacts of increased numbers of visitors over days, weeks, months, would have to be monitored. One solution would be to control access to the refuge.

DIRECT AND INDIRECT EFFECTS OR IMPACTS

Direct effects are caused by an action and occur at the same time as the action. Indirect effects are caused by an action but are manifested later in time or further removed in distance, but still reasonably foreseeable.

The actions proposed for implementation under the proposed alternative include facility development, wildlife and population management, resource protection, public use, and administrative programs. These actions would result in both direct and indirect effects. Facility development, for example, would most likely lead to increased public use, a direct effect; and it, in turn, would lead to indirect effects such as increased littering, noise, and boat traffic around the refuges.

Other indirect effects that may result from implementing the proposed alternative include minor impacts from siltation due to the disturbance of soils and vegetation during construction of new facilities. Anticipated indirect effects or impacts are thought to be minimal and/or short-term issues. Best management practices during construction, proper management of the refuges, and education of the public would deter impacts. As issues arise, the Service would also utilize adaptive management to minimize negative impacts.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The habitat protection and management actions proposed under the proposed alternative are dedicated to maintaining the long-term productivity of refuge habitats. The benefits of this Draft CCP/EA for long-term productivity far outweigh any impacts from short-term actions, such as the construction of observation towers and a visitor center, or creation of new trails. While these activities would cause short-term negative impacts, the educational values and associated public support gained from the improved visitor experience would produce long-term benefits for the entire ecosystem.

The key to protecting and ensuring the refuge's long-term productivity is to find the threshold where public uses do not degrade or interfere with natural resources. The actions proposed under the proposed alternative have been carefully conceived to achieve that threshold. Therefore, implementing the proposed alternative would lead to long-term benefits for wildlife protection and land conservation that far outweigh any short-term impacts.

V. Consultation and Coordination

OVERVIEW

This chapter summarizes the consultation and coordination that has occurred to date in identifying the issues, alternatives, and proposed alternative, which are presented in this Draft CCP/EA. It lists the meetings that have been held with the various agencies, organizations, and individuals who were consulted in the preparation of the Draft CCP/EA. The list of participants, in addition to those individuals and organizations who provided comments during the public scoping process, includes the CCP Core Planning Team and the Interagency Coordination Planning Team.

The following meetings, open houses, and contacts were undertaken by the Service during the preparation of the Draft CCP/EA.

Core Planning Team

The Core Planning Team is comprised exclusively of Service staff and Service contractor. Personnel from St. Marks NWR and the Chassahowitzka NWR Complex, which includes the Tampa Bay Refuges, serve on the team. Key tasks of the team included defining and refining the refuges' vision; identifying, reviewing, and filtering the issues; defining the goals and objectives; and outlining the alternatives.

U.S. Fish and Wildlife Service

- Jim Kraus, Refuge Manager, Chassahowitzka NWR Complex
- Keith Ramos, Deputy Refuge Manager, Chassahowitzka NWR Complex
- Richard Meyers, Assistant Refuge Manager, Chassahowitzka NWR Complex/Tampa Bay Refuges
- Joyce Kleen, Wildlife Biologist, Chassahowitzka NWR Complex
- Ivan Vicente, Visitor Services Specialist, Chassahowitzka NWR Complex
- Mary Morris, Natural Resources Planner, St. Marks NWR
- Evelyn Nelson, Writer/Editor, Southeast Regional Office
- Anne Aiken, Contractor, Tennessee Valley Authority

Interagency Coordination Planning Team

The Interagency Coordination Planning Team includes local, state, and federal governmental field staff representatives involved with the resources at the local level. In addition to some of the members of the Core Planning Team, the Interagency Coordination Planning Team consists of personnel from the Service's Savannah Coastal Refuges and the local Ecological Services office; the U.S. Coast Guard; Florida Park Service; Florida Fish and Wildlife Conservation Commission; County Environmental Management and Parks Departments; and the Tampa Bay Estuary Program. During the Interagency Scoping Meeting on October 12, 2005, the team identified and discussed issues and opportunities for resource protection, habitat restoration, and public use at the Tampa Bay Refuges. Members of the team who participated in the initial scoping meeting are as follows:

Fish and Wildlife Service

- Jim Kraus, Refuge Manager, Chassahowitzka NWR Complex
- Richard Meyers, Assistant Refuge Manager, Chassahowitzka NWR Complex/Tampa Bay Refuges
- Joyce Kleen, Wildlife Biologist, Chassahowitzka NWR Complex
- Mary Morris, Natural Resources Planner, St. Marks NWR
- Richard Kanaski, Regional Historic Preservation Officer and Regional Archaeologist, Savannah Coastal Refuges
- Linda Smith, Ecological Services Office

U.S. Coast Guard

- Lt. Heather Osburn, U.S.Coast Guard Sector, St. Petersburg

State of Florida

- Tom Watson, Assistant Park Manager, Egmont Key Preserve State Park
- Peter Krulder, Park Manager, Honeymoon Island State Park
- Valinda Subic, District 4 Bureau Chief, Florida Park Service
- Brian Burket, Park Planner, Florida Park Service
- Terry Hingtgen, Environmental Specialist III, Florida Park Service
- James Beever, Biological Scientist IV, Florida Fish and Wildlife Conservation Commission
- William R. Smith, Biological Scientist III, Florida Fish and Wildlife Conservation Commission
- Lee Taylor, Southwest Region Coordinator, Florida Fish and Wildlife Conservation Commission
- Parks Small, Natural and Cultural Resources Bureau Chief, Florida Park Service

County Agencies

- Eric Fehrmann, M.S., Environmental Program Manager, Pinellas County Environmental Management
- Deborah J. Chayet, Grants Specialist, Pinellas County Park Department

Other Agencies

- Lindsay Griffen, Environmental Associate, Tampa Bay Estuary Program

Public Scoping Meetings

The Core Planning Team hosted open houses/public scoping meetings in Hillsborough, Pinellas, and Manatee Counties in February 2006. The refuges' draft vision, goals, and issues were presented and public input was requested. Comment forms were made available at the meetings, as well as at the refuges' headquarters. The completed forms were submitted to the Service by mail or e-mail. Public input is greatly appreciated and was incorporated into this Draft CCP/EA.

SECTION C. APPENDICES

Appendix A. Glossary

- Adaptive Management:** Refers to a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in a management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
- Alluvial:** Sediment transported and deposited in a delta or riverbed by flowing water.
- Alternative:** 1. A reasonable way to fix the identified problem or satisfy the stated need (40 CFR 1500.2). 2. Alternatives are different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission, and resolving issues (Service Manual 602 FW 1.6B).
- Anadromous:** Migratory fishes that spend most of their lives in the sea and migrate to fresh water to breed.
- Biological Diversity:** The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1. 12B). The System's focus is on indigenous species, biotic communities, and ecological processes. Also referred to as biodiversity.
- Carrying Capacity:** The maximum population of a species able to be supported by a habitat or area.
- Categorical Exclusion:** A category of actions that does not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a federal agency pursuant to the National Environmental Policy Act (40 CFR 1508.4).
- CFR:** Code of Federal Regulations.
- Compatible Use:** A proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose(s) of the national wildlife refuge [50 CFR 25.12 (a)]. A compatibility determination supports the selection of compatible uses and identifies stipulations or limits necessary to ensure compatibility.

Comprehensive Conservation Plan:	A document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge; helps fulfill the mission of the Refuge System; maintains and, where appropriate, restores the ecological integrity of each refuge and the Refuge System; helps achieve the goals of the National Wilderness Preservation System; and meets other mandates (Service Manual 602 FW 1.6 E).
Concern:	See Issue
Cover Type:	The present vegetation of an area.
Cultural Resource Inventory:	A professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).
Cultural Resource Overview:	A comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate information from a field office's background or literature search described in Section VIII of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).
Cultural Resources:	The remains of sites, structures, or objects used by people in the past.
Designated Wilderness Area:	An area designated by the U.S. Congress to be managed as part of the National Wilderness Preservation System (Draft Service Manual 610 FW 1.5).
Disturbance:	Significant alteration of habitat structure or composition. May be natural (e.g., fire) or human-caused events (e.g., aircraft overflight).
Ecosystem:	A dynamic and interrelating complex of plant and animal communities and their associated non-living environment.
Ecosystem Management:	Management of natural resources using system-wide concepts to ensure that all plants and animals in ecosystems are maintained at viable levels in native habitats and basic ecosystem processes are perpetuated indefinitely.

Endangered Species (Federal):	A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
Endangered Species (State):	A plant or animal species in danger of becoming extinct or extirpated in the state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.
Environmental Assessment (EA):	A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).
Environmental Impact Statement (EIS):	A detailed written statement required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).
Estuary:	The wide lower course of a river into which the tides flow. The area where the tide meets a river current.
Finding of No Significant Impact (FONSI):	A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).
Goal:	Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (Service Manual 620 FW 1.6J).
Habitat:	Suite of existing environmental conditions required by an organism for survival and reproduction. The place where an organism typically lives.
Habitat Restoration:	Management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy ecosystems.
Habitat Type:	See Vegetation Type.
Improvement Act:	The National Wildlife Refuge System Improvement Act of 1997.
Informed Consent:	The grudging willingness of opponents to “go along” with a course of action that they actually oppose (Bleiker).

Issue:	Any unsettled matter that requires a management decision [e.g., an initiative, opportunity, resource management problem, threat to the resources of the unit, conflict in uses, public concern, or other presence of an undesirable resource condition (Service Manual 602 FW 1.6K)].
Management Alternative:	See Alternative
Management Concern:	See Issue
Management Opportunity:	See Issue
Migration:	The seasonal movement from one area to another and back.
Mission Statement:	Succinct statement of the unit's purpose and reason for being.
Monitoring:	The process of collecting information to track changes of selected parameters over time.
National Environmental Policy Act of 1969 (NEPA):	Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (40 CFR 1500).
National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57):	Under the Refuge Improvement Act, the Fish and Wildlife Service is required to develop 15-year comprehensive conservation plans for all national wildlife refuges outside Alaska. The Act also describes the six public uses given priority status within the Refuge System (i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation).
National Wildlife Refuge System Mission:	The mission is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.
National Wildlife Refuge System:	Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; wildlife ranges; game ranges; wildlife management areas; or waterfowl production areas.

National Wildlife Refuge:	A designated area of land, water, or an interest in land or water within the Refuge System.
Native Species:	Species that normally live and thrive in a particular ecosystem.
Noxious Weed:	A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive or difficult to manage; parasitic; a carrier or host of serious insect or disease; or non-native, new, or not common to the United States. According to the Federal Noxious Weed Act (P.L. 93-639), a noxious weed is one that causes disease or had adverse effects on man or his environment and therefore is detrimental to the agriculture and commerce of the United States and to the public health.
Objective:	A concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating the success of strategies. Making objectives attainable, time-specific, and measurable (Service Manual 602 FW 1.6N).
Plant Association:	A classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.
Plant Community:	An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site, such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community.
Preferred Alternative:	This is the alternative determined (by the decision-maker) to best achieve the refuge purpose, vision, and goals; contributes to the Refuge System mission, addresses the significant issues; and is consistent with principles of sound fish and wildlife management.
Prescribed Fire:	The application of fire to wildland fuels to achieve identified land use objectives (Service Manual 621 FW 1.7). May occur from natural ignition or intentional ignition.
Priority Species:	Fish and wildlife species that require protective measures and/or management guidelines to ensure their perpetuation. Priority species include the following: (1) State-listed and candidate species; (2) species or groups of animals susceptible to significant population declines within a specific area or statewide by virtue of their inclination to aggregate (e.g., seabird colonies); and (3) species of recreation, commercial, and/or tribal importance.
Public Involvement Plan:	Broad long-term guidance for involving the public in the comprehensive conservation planning process.

Public Involvement:	A process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
Public:	Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in service issues and those who do or do not realize that Service decisions may affect them.
Purposes of the Refuge:	“The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge sub-unit.” For refuges that encompass congressionally designated wilderness, the purposes of the Wilderness Act are additional purposes of the refuge (Service Manual 602 FW 106 S).
Recommended Wilderness:	Areas studied and found suitable for wilderness designation by both the Director of the Fish and Wildlife Service and the Secretary of the Department of the Interior, and recommended for designation by the President to Congress. These areas await only legislative action by Congress in order to become part of the Wilderness System. Such areas are also referred to as “pending in Congress” (Draft Service Manual 610 FW 1.5).
Record of Decision (ROD):	A concise public record of decision prepared by the federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were not), and a summary of monitoring and enforcement where applicable for any mitigation (40 CFR 1505.2).
Refuge Goal:	See Goal
Refuge Purposes:	See Purposes of the Refuge
Songbirds: (Also Passerines)	A category of birds that is medium to small, perching landbirds. Most are territorial singers and migratory.
Step-down Management Plan:	A plan that provides specific guidance on management subjects (e.g., habitat, public use, fire, and safety) or groups of related subjects. It describes strategies and implementation schedules for meeting CCP goals and objectives (Service Manual 602 FW 1.6 U).

Strategy:	A specific action, tool, technique, or combination of actions, tools, and techniques used to meet unit objectives (Service Manual 602 FW 1.6 U).
Study Area:	The area reviewed in detail for wildlife, habitat, and public use potential. For purposes of this CCP, the study area includes the lands within the currently approved refuge boundary and potential refuge expansion areas.
Threatened Species (Federal):	Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
Threatened Species (State):	A plant or animal species likely to become endangered in the state within the near future if factors contributing to population decline or habitat degradation or loss continue.
Tiering:	The coverage of general matters in broader environmental impact statements with subsequent narrower statements of environmental analysis, incorporating by reference, the general discussions and concentrating on specific issues (40 CFR 1508.28).
U.S. Fish and Wildlife Service Mission:	The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.
Unit Objective:	See Objective
Vegetation Type, Habitat Type, Forest Cover Type:	A land classification system based upon the concept of distinct plant associations.
Vision Statement:	A concise statement of what the planning unit should be, or what we hope to do, based primarily upon the Refuge System mission and specific refuge purposes, and other mandates. We will tie the vision statement for the refuge to the mission of the Refuge System; the purpose(s) of the refuge; the maintenance or restoration of the ecological integrity of each refuge and the Refuge System; and other mandates (Service Manual 602 FW 1.6 Z).

Wilderness Study Areas:

Lands and waters identified through inventory as meeting the definition of wilderness and undergoing evaluation for recommendation for inclusion in the Wilderness System. A study area must meet the following criteria:

- Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
- Has outstanding opportunities for solitude or a primitive and unconfined type of recreation; and
- Has at least 5,000 contiguous roadless acres or is sufficient in size as to make practicable its preservation and use in an unimpaired condition (Draft Service Manual 610 FW 1.5).

Wilderness:

See Designated Wilderness

Wildfire:

A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (Service Manual 621 FW 1.7).

Wildland Fire:

Every wildland fire is either a wildfire or a prescribed fire (Service Manual 621 FW 1.3)

ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disability Act
BCC	Birds of Conservation Concern
BRT	Biological Review Team
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
cfs	cubic feet per second
DOI	Department of the Interior
DU	Ducks Unlimited
EA	Environmental Assessment
EE	environmental education
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
FTE	full-time equivalent
FY	Fiscal Year
GIS	Global Information System
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
PFT	Permanent Full Time
PUNA	Public Use Natural Area
RM	Refuge Manual
RNA	Research Natural Area
ROD	Record of Decision
RONs	Refuge Operating Needs System
RRP	Refuge Roads Program
FWS	U.S. Fish and Wildlife Service (also Service)
TFT	Temporary Full Time
USC	United States Code

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Appendix C. Relevant Legal Mandates and Executive Orders

STATUE	DESCRIPTION
Administrative Procedures Act (1946)	Outlines administrative procedures to be followed by federal agencies with respect to identification of information to be made public; publication of material in the Federal Register; maintenance of records; attendance and notification requirements for specific meetings and hearings; issuance of licenses; and review of agency actions.
American Antiquities Act of 1906	Provides penalties for unauthorized collection, excavation, or destruction of historic or prehistoric ruins, monuments, or objects of antiquity on lands owned or controlled by the United States. The Act authorizes the President to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States.
American Indian Religious Freedom Act of 1978	Protects the inherent right of Native Americans to believe, express, and exercise their traditional religions, including access to important sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.
Americans With Disabilities Act of 1990	Intended to prevent discrimination of and make American society more accessible to people with disabilities. The Act requires reasonable accommodations to be made in employment, public services, public accommodations, and telecommunications for persons with disabilities.
Anadromous Fish Conservation Act of 1965, as amended	Authorizes the Secretaries of Interior and Commerce to enter into cooperative agreements with states and other non-federal interests for conservation, development, and enhancement of anadromous fish and contribute up to 50 percent as the federal share of the cost of carrying out such agreements. Reclamation construction programs for water resource projects needed solely for such fish are also authorized.
Archaeological Resources Protection Act of 1979, as amended.	This Act strengthens and expands the protective provisions of the Antiquities Act of 1906 regarding archaeological resources. It also revised the permitting process for archaeological research.
Architectural Barriers Act of 1968	Requires that buildings and facilities designed, constructed, or altered with federal funds, or leased by a federal agency, must comply with standards for physical accessibility.
Bald and Golden Eagle Protection Act of 1940, as amended	Prohibits the possession, sale or transport of any bald or golden eagle, alive or dead, or part, nest, or egg except as permitted by the Secretary of the Interior for scientific or exhibition purposes, or for the religious purposes of Indians.

STATUE	DESCRIPTION
Bankhead-Jones Farm Tenant Act of 1937	Directs the Secretary of Agriculture to develop a program of land conservation and utilization in order to correct maladjustments in land use and thus assist in such things as control of soil erosion, reforestation, conservation of natural resources and protection of fish and wildlife. Some early refuges and hatcheries were established under authority of this Act.
Cave Resources Protection Act of 1988	Established requirements for the management and protection of caves and their resources on federal lands, including allowing the land managing agencies to withhold the location of caves from the public, and requiring permits for any removal or collecting activities in caves on federal lands.
Clean Air Act of 1970	Regulates air emissions from area, stationary, and mobile sources. This Act and its amendments charge federal land managers with direct responsibility to protect the “air quality and related values” of land under their control. These values include fish, wildlife, and their habitats.
Clean Water Act of 1974, as amended	This Act and its amendments have as its objective the restoration and maintenance of the chemical, physical, and biological integrity of the Nation’s waters. Section 401 of the Act requires that federally permitted activities comply with the Clean Water Act standards, state water quality laws, and any other appropriate state laws. Section 404 charges the U.S. Army Corps of Engineers with regulating discharge of dredge or fill materials into waters of the United States, including wetlands.
Coastal Barrier Resources Act of 1982 (CBRA)	Identifies undeveloped coastal barriers along the Atlantic and Gulf Coasts and included them in the John H. Chafee Coastal Barrier Resources System (CBRS). The objectives of the act are to minimize loss of human life, reduce wasteful federal expenditures, and minimize the damage to natural resources by restricting most federal expenditures that encourage development within the CBRS.
Coastal Barrier Improvement Act of 1990	Reauthorized the Coastal Barrier Resources Act (CBRA), expanded the CBRS to include undeveloped coastal barriers along the Great Lakes and in the Caribbean, and established “Otherwise Protected Areas (OPAs).” The Service is responsible for maintaining official maps, consulting with federal agencies that propose spending federal funds within the CBRS and OPAs, and making recommendations to Congress about proposed boundary revisions.
Coastal Wetlands Planning, Protection, and Restoration (1990)	Authorizes the Director of the Fish and Wildlife Service to participate in the development of a Louisiana coastal wetlands restoration program, participate in the development and oversight of a coastal wetlands conservation program, and lead in the implementation and administration of a national coastal wetlands grant program.

STATUE	DESCRIPTION
Coastal Zone Management Act of 1972, as amended	Established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans and requires that “any federal activity within or outside of the coastal zone that affects any land or water use or natural resource of the coastal zone” shall be “consistent to the maximum extent practicable with the enforceable policies” of a state’s coastal zone management plan. The law includes an Enhancement Grants Program for protecting, restoring, or enhancing existing coastal wetlands or creating new coastal wetlands. It also established the National Estuarine Research Reserve System, guidelines for estuarine research, and financial assistance for land acquisition.
Emergency Wetlands Resources Act of 1986	This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act requires the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amounts equal to import duties on arms and ammunition. It also established entrance fees at national wildlife refuges.
Endangered Species Act of 1973, as amended	Provides for the conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging the establishment of state programs. It provides for the determination and listing of threatened and endangered species and the designation of critical habitats. Section 7 requires refuge managers to perform internal consultation before initiating projects that affect or may affect endangered species.
Environmental Education Act of 1990	This Act established the Office of Environmental Education within the U.S. Environmental Protection Agency to develop and administer a federal environmental education program in consultation with other federal natural resource management agencies, including the Fish and Wildlife Service.
Estuary Protection Act of 1968	Authorized the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory estuaries of the United States, including land and water of the Great Lakes, and to determine whether such areas should be acquired for protection. The Secretary is also required to encourage state and local governments to consider the importance of estuaries in their planning activities relative to federal natural resource grants. In approving any state grants for acquisition of estuaries, the Secretary was required to establish conditions to ensure the permanent protection of estuaries.

STATUE	DESCRIPTION
Estuaries and Clean Waters Act of 2000	This law creates a federal interagency council that includes the Director of the Fish and Wildlife Service, the Secretary of the Army for Civil Works, the Secretary of Agriculture, the Administrator of the Environmental Protection Agency and the Administrator for the National Oceanic and Atmospheric Administration. The council is charged with developing a national estuary habitat restoration strategy and providing grants to entities to restore and protect estuary habitat to promote the strategy.
Food Security Act of 1985, as amended (Farm Bill)	The Act contains several provisions that contribute to wetland conservation. The Swampbuster provisions state that farmers who convert wetlands for the purpose of planting after enactment of the law are ineligible for most farmer program subsidies. It also established the Wetland Reserve Program to restore and protect wetlands through easements and restoration of the functions and values of wetlands on such easement areas.
Farmland Protection Policy Act of 1981, as amended	The purpose of this law is to minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. Federal programs include construction projects and the management of federal lands.
Federal Advisory Committee Act (1972), as amended	Governs the establishment of and procedures for committees that provide advice to the federal government. Advisory committees may be established only if they will serve a necessary, nonduplicative function. Committees must be strictly advisory unless otherwise specified and meetings must be open to the public.
Federal Coal Leasing Amendment Act of 1976	Provided that nothing in the Mining Act, the Mineral Leasing Act, or the Mineral Leasing Act for Acquired Lands authorized mining coal on refuges.
Federal-Aid Highways Act of 1968	Established requirements for approval of federal highways through national wildlife refuges and other designated areas to preserve the natural beauty of such areas. The Secretary of Transportation is directed to consult with the Secretary of the Interior and other federal agencies before approving any program or project requiring the use of land under their jurisdiction.
Federal Noxious Weed Act of 1990, as amended	The Secretary of Agriculture was given the authority to designate plants as noxious weeds and to cooperate with other federal, State and local agencies, farmers' associations, and private individuals in measures to control, eradicate, prevent, or retard the spread of such weeds. The Act requires each Federal land-managing agency, including the Fish and Wildlife Service, to designate an office or person to coordinate a program to control such plants on the agency's land and implement cooperative agreements with the states, including integrated management systems to control undesirable plants.

STATUE	DESCRIPTION
Fish and Wildlife Act of 1956	Establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also includes the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife resources. Among other things, it authorizes the Secretary of the Interior to take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources including, but not limited to, research, development of existing facilities, and acquisition by purchase or exchange of land and water or interests therein.
Fish and Wildlife Conservation Act of 1980, as amended	Requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under the Endangered Species Act.
Fish and Wildlife Coordination Act of 1958	Promotes equal consideration and coordination of wildlife conservation with other water resource development programs by requiring consultation with the Fish and Wildlife Service and the state fish and wildlife agencies where the “waters of a stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified” by any agency under federal permit or license.
Improvement Act of 1978	This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.
Fishery (Magnuson) Conservation and Management Act of 1976	Established Regional Fishery Management Councils comprised of federal and state officials, including the Fish and Wildlife Service. It provides for regulation of foreign fishing and vessel fishing permits.
Freedom of Information Act, 1966	Requires all federal agencies to make available to the public for inspection and copying administrative staff manuals and staff instructions; official, published and unpublished policy statements; final orders deciding case adjudication; and other documents. Special exemptions have been reserved for nine categories of privileged material. The Act requires the party seeking the information to pay reasonable search and duplication costs.
Geothermal Steam Act of 1970, as amended	Authorizes and governs the lease of geothermal steam and related resources on public lands. Section 15 c of the Act prohibits issuing geothermal leases on virtually all Service-administrative lands.

STATUE	DESCRIPTION
Lacey Act of 1900, as amended	Originally designed to help states protect their native game animals and to safeguard U.S. crop production from harmful foreign species, this Act prohibits interstate and international transport and commerce of fish, wildlife or plants taken in violation of domestic or foreign laws. It regulates the introduction to America of foreign species.
Land and Water Conservation Fund Act of 1948	This Act provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.
Marine Mammal Protection Act of 1972, as amended	The 1972 Marine Mammal Protection Act established a federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otter, walrus, polar bear, dugong, and manatee. The Department of Commerce is responsible for cetaceans and pinnipeds, other than the walrus. With certain specified exceptions, the Act establishes a moratorium on the taking and importation of marine mammals, as well as products taken from them.
Migratory Bird Conservation Act of 1929	Established a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds. The role of the commission was expanded by the North American Wetland Conservation Act to include approving wetlands acquisition, restoration, and enhancement proposals recommended by the North American Wetlands Conservation Council.
Migratory Bird Hunting and Conservation Stamp Act of 1934	Also commonly referred to as the "Duck Stamp Act," requires waterfowl hunters 16 years of age or older to possess a valid federal hunting stamp. Receipts from the sale of the stamp are deposited into the Migratory Bird Conservation Fund for the acquisition of migratory bird refuges.
Migratory Bird Treaty Act of 1918, as amended	This Act implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Except as allowed by special regulations, this Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, barter, export or import any migratory bird, part, nest, egg, or product.
Mineral Leasing Act for Acquired Lands (1947), as amended	Authorizes and governs mineral leasing on acquired public lands.

STATUE	DESCRIPTION
Minerals Leasing Act of 1920, as amended	Authorizes and governs leasing of public lands for development of deposits of coal, oil, gas, and other hydrocarbons; sulphur; phosphate; potassium; and sodium. Section 185 of this title contains provisions relating to granting rights-of-way over federal lands for pipelines.
Mining Act of 1872, as amended	Authorizes and governs prospecting and mining for the so-called “hardrock” minerals (i.e., gold and silver) on public lands.
National and Community Service Act of 1990	Authorizes several programs to engage citizens of the U.S. in full-and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Among other things, this law establishes the American Conservation and Youth Service Corps to engage young adults in approved human and natural resource projects, which will benefit the public or are carried out on federal or Indian lands.
National Environmental Policy Act of 1969	Requires analysis, public comment, and reporting for environmental impacts of federal actions. It stipulates the factors to be considered in environmental impact statements, and requires that federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unqualified environmental values are given appropriate consideration, along with economic and technical considerations.
National Historic Preservation Act of 1966, as amended	It establishes a National Register of Historic Places and a program of matching grants for preservation of significant historical features. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register.
National Trails System Act (1968), as amended	Established the National Trails System to protect the recreational, scenic, and historic values of some important trails. National recreation trails may be established by the Secretaries of Interior or Agriculture on land wholly or partly within their jurisdiction, with the consent of the involved state(s), and other land managing agencies, if any. National scenic and national historic trails may only be designated by Congress. Several national trails cross units of the National Wildlife Refuge System.
National Wildlife Refuge System Administration Act of 1966	Prior to 1966, there was no single federal law that governed the administration of the various national wildlife refuges that had been established. This Act defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge provided such use is compatible with the major purposes(s) for which the refuge was established.

STATUE	DESCRIPTION
National Wildlife Refuge System Improvement Act of 1997	This Act amends the National Wildlife Refuge System Administration Act of 1966. This Act defines the mission of the National Wildlife Refuge System, establishes the legitimacy and appropriateness of six priority wildlife-dependent public uses, establishes a formal process for determining compatible uses of Refuge System lands, identifies the Secretary of the Interior as responsible for managing and protecting the Refuge System, and requires the development of a comprehensive conservation plan for all refuges outside of Alaska.
Native American Graves Protection and Repatriation Act of 1990	Requires federal agencies and museums to inventory, determine ownership of, and repatriate certain cultural items and human remains under their control or possession. The Act also addresses the repatriation of cultural items inadvertently discovered by construction activities on lands managed by the agency.
Neotropical Migratory Bird Conservation Act of 2000	Establishes a matching grant program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America, and the Caribbean.
North American Wetlands Conservation Act of 1989	Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, the United States, and Mexico. The North American Wetlands Conservation Council was created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission. Available funds may be expended for up to 50 percent of the United States' share cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands).
Refuge Recreation Act of 1962, as amended	This Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife-oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.
Partnerships for Wildlife Act of 1992	Establishes a Wildlife Conservation and Appreciation Fund to receive appropriated funds and donations from the National Fish and Wildlife Foundation and other private sources to assist the state fish and game agencies in carrying out their responsibilities for conservation of non-game species. The funding formula is no more than 1/3 federal funds, at least 1/3 foundation funds, and at least 1/3 state funds.

STATUE	DESCRIPTION
Refuge Revenue Sharing Act of 1935, as amended	Provided for payments to counties in lieu of taxes from areas administered by the Fish and Wildlife Service. Counties are required to pass payments along to other units of local government within the county, which suffer losses in tax revenues due to the establishment of Service areas.
Rehabilitation Act of 1973	Requires nondiscrimination in the employment practices of federal agencies of the executive branch and contractors. It also requires all federally assisted programs, services, and activities to be available to people with disabilities.
Rivers and Harbors Appropriations Act of 1899, as amended	Requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States. The Fish and Wildlife Coordination Act provides authority for the Service to review and comment on the effects on fish and wildlife activities proposed to be undertaken or permitted by the Corps of Engineers. Service concerns include contaminated sediments associated with dredge or fill projects in navigable waters.
Sikes Act (1960), as amended	Provides for the cooperation by the Departments of Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources and outdoor recreation facilities on military reservations throughout the United States. It requires the Secretary of each military department to use trained professionals to manage the wildlife and fishery resource under his jurisdiction, and requires that federal and state fish and wildlife agencies be given priority in management of fish and wildlife activities on military reservations.
Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948	This Act provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.
Transportation Equity Act for the 21st Century (1998)	Established the Refuge Roads Program, requires transportation planning that includes public involvement, and provides funding for approved public use roads and trails and associated parking lots, comfort stations, and bicycle/pedestrian facilities.
Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended	Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

STATUE	DESCRIPTION
Water Resources Planning Act of 1965	Established Water Resources Council to be composed of Cabinet representatives including the Secretary of the Interior. The Council reviews river basin plans with respect to agricultural, urban, energy, industrial, recreational and fish and wildlife needs. The act also established a grant program to assist States in participating in the development of related comprehensive water and land use plans.
Wild and Scenic Rivers Act of 1968, as amended	This Act selects certain rivers of the nation possessing remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values; preserves them in a free-flowing condition; and protects their local environments.
Wilderness Act of 1964, as amended	This Act directs the Secretary of the Interior to review every roadless area of 5,000 acres or more and every roadless island regardless of size within the National Wildlife Refuge System and to recommend suitability of each such area. The Act permits certain activities within designated wilderness areas that do not alter natural processes. Wilderness values are preserved through a "minimum tool" management approach, which requires refuge managers to use the least intrusive methods, equipment, and facilities necessary for administering the areas.
Youth Conservation Corps Act of 1970	Established a permanent Youth Conservation Corps (YCC) program within the Departments of Interior and Agriculture. Within the Service, YCC participants perform many tasks on refuges, fish hatcheries, and research stations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 11593, Protection and Enhancement of the Cultural Environment (1971)	States that if the Service proposes any development activities that may affect the archaeological or historic sites, the Service will consult with Federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.
EO 11644, Use of Off-road Vehicles on Public Land (1972)	Established policies and procedures to ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.
EO 11988, Floodplain Management (1977)	The purpose of this Executive Order is to prevent federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of floodplain development.” In the course of fulfilling their respective authorities, federal agencies “shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.”
EO 11989 (1977), Amends Section 2 of EO 11644	Directs agencies to close areas negatively impacted by off-road vehicles.
EO 11990, Protection of Wetlands (1977)	Federal agencies are directed to provide leadership and take action to minimize the destruction, loss of degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
EO 12372, Intergovernmental Review of Federal Programs (1982)	Seeks to foster intergovernmental partnerships by requiring federal agencies to use the state process to determine and address concerns of state and local elected officials with proposed federal assistance and development programs.
EO 12898, Environmental Justice (1994)	Requires federal agencies to identify and address disproportionately high and adverse effects of its programs, policies, and activities on minority and low-income populations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 12906, Coordinating Geographical Data Acquisition and Access (1994), Amended by EO 13286 (2003). Amendment of EOs and other actions in connection with transfer of certain functions to Secretary of DHS.	Recommended that the executive branch develop, in cooperation with state, local, and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data. Of particular importance to comprehensive conservation planning is the National Vegetation Classification System (NVCS), which is the adopted standard for vegetation mapping. Using NVCS facilitates the compilation of regional and national summaries, which in turn, can provide an ecosystem context for individual refuges.
EO 12962, Recreational Fisheries (1995)	Federal agencies are directed to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities in cooperation with states and tribes.
EO 13007, Native American Religious Practices (1996)	Provides for access to, and ceremonial use of, Indian sacred sites on federal lands used by Indian religious practitioners and direction to avoid adversely affecting the physical integrity of such sites.
EO 13061, Federal Support of Community Efforts Along American Heritage Rivers (1997)	Established the American Heritage Rivers initiative for the purpose of natural resource and environmental protection, economic revitalization, and historic and cultural preservation. The Act directs Federal agencies to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage.
EO 13084, Consultation and Coordination With Indian Tribal Governments (2000)	Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.
EO 13112, Invasive Species (1999)	Federal agencies are directed to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner, accurately monitor invasive species, provide for restoration of native species and habitat conditions, conduct research to prevent introductions and to control invasive species, and promote public education on invasive species and the means to address them. This EO replaces and rescinds EO 11987, Exotic Organisms (1977).

EXECUTIVE ORDERS	DESCRIPTIONS
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. (2001)	Instructs federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.

Appendix D. Public Involvement

SUMMARY OF PUBLIC SCOPING COMMENTS

The Service conducted three public meetings in February 2006 for the purpose of accepting public comments on issues to be addressed in the refuges' Draft CCP/EA. The public meetings included an informal workshop where the public was invited to talk with refuge staff and review maps and information on the refuges, a presentation on the refuges and the CCP process, and an open comment period during which the public was invited to raise issues and topics of concern and to ask questions.

The Service published announcements for the public meetings in the *Federal Register* and legal notices in the local newspapers. News releases were also sent to local newspapers and public service announcements to television and radio stations.

The first public meeting was held on February 8, 2006, in Tampa, Florida, Hillsborough County, and was attended by 13 members of the public, including representatives from the state and county governments and a representative from the office of Senator Mel Martinez. The second meeting was held on February 9 in St. Petersburg, Florida, Pinellas County, and was attended by 26 members of the public, which included representatives of state and county governments. The third public meeting was held on February 13 in Palmetto, Florida, Manatee County, and was attended by 12 members of the public, including representatives from the state government.

The planning team expanded its list of issues and concerns to include those generated by the agencies, organizations, businesses, and citizens from the local communities. These issues and concerns formed the basis for the development and comparison of objectives in the three alternatives described in the EA. The following is a summary of comments from the three public meetings:

Public Use (9 questions; mostly Egmont Key NWR):

There were questions concerning what public uses were allowed on Egmont Key NWR—hunting (no), bicycling (no), photography (yes). There were a few questions concerning the carrying capacity of the refuge—will we establish one and can we install mooring balls (bouys) to limit the number of visitors. There were questions on the charging of entrance fees, landing fees or user fees, and how the money would be divided between the Service and the FPS. There was also a question as to whether or not we would consider restroom facilities on the island; restrooms may be added to the Guard House/Visitor Center.

Jurisdiction (7 questions; all three refuges):

Egmont Key NWR is cooperatively managed as a state park and a question was asked if this was done elsewhere--not to our knowledge. There were questions as to whether the Service protects the submerged lands and who actually has the management authority of those submerged lands.

General CCP Questions (6 questions; three refuges):

Several questions concerned the CCP process. Are all three refuges lumped into one CCP—yes, for Tampa Bay Refuges. What part will the county play in the CCP process? The county has been invited to the interagency scoping meetings. Will the CCP address sea level change/rise/global warming? Long-term ecological monitoring needs to be conducted. Do the desired future conditions

include restoring bird populations that have declined? Yes. One person was concerned about wanting citizen participation and wanted to borrow the CCP program to present it to other groups. Some wanted to know if it would help the CCP process by commenting that both the Egmont Key Unit Management Plan and the CCP should be in sync.

Law Enforcement (5 questions; Egmont Key and Passage Key NWRs):

There were questions about whether dogs were allowed on Egmont Key and Passage Key NWRs and whether alcohol was causing more problems. Although both dogs and alcohol are not permitted, refuge and state officers write citations for both. There were questions about whether more officers were needed and if a citizen observed something, could it be referred to a federal or state officer for prosecution.

Predators (3 questions; Egmont Key NWR-cats and Pinellas NWR-raccoons):

There continue to be two feral cats on Egmont within the privately owned Tampa Bay Pilots compound; both are fixed. Raccoons have devastated the bird colony on Tarpon Key and there were questions as to whether we were conducting raccoon control and if we were coordinating that control with Fort DeSoto, the most likely source of raccoons.

Exotics (3 questions; Egmont Key and Pinellas NWRs):

Exotic plants were identified as a threat to Egmont Key and Pinellas NWRs. There were questions on what the Service is doing to combat exotics and how this control is funded.

Staffing (3 questions; all three refuges):

There were concerns that there was not enough staff in Tampa Bay or enough people to do sound scientific research. There was a recommendation to keep a staff person in Tampa Bay.

Wildlife Management (3 questions: all three refuges)

There were questions relating to whether birds would be protected in case of oil spills and if there are significant benthic organisms on the west side of Egmont Key NWR. Birds will be protected in case of oil spills and we are not aware of significant benthic resources on the west side of Egmont Key NWR. There was also a question as to whether changes in the Endangered Species Act will weaken protection on refuges.

Erosion (2 questions; all three refuges):

Erosion was identified as a threat to these refuges. There is a loss of beach habitat where sea turtles nest and where gulls, terns, skimmers, and brown pelicans nest. Even with beach renourishment, the sand washes away again. There needs to be a long-term solution.

Commercial Operations (1 question; Egmont Key NWR):

There was one question concerning who has control of commercial operations going to Egmont Key NWR.

Manatees (1 question; all three refuges):

There was one question concerning if we had any manatee protection measures. The three refuges have no specific manatee protection measures, but there are several areas of protection around the islands. There are seagrass beds on the east side of Egmont Key NWR where boats are not permitted. There are seagrass beds surrounding the islands of Pinellas NWR where boats may pole or use trolling motors, but internal combustion engines are not permitted. These measures not only protect the seagrass beds, but also help to protect manatees.

Red Tide (1 question; all three refuges):

There was one question concerning an additional threat to the refuges—red tide. Thousands of dead fish have washed up on Egmont Key NWR and the FWC has conducted inventories of those species. Impacts may be felt by nesting birds in future years with fish mortality and possibly less food to feed young birds.

Passage Key (1 question; Passage Key NWR):

There was a question concerning Passage Key NWR. Since it comes and goes, will we still protect it; the answer was yes.

Appendix E. Appropriate Use Determinations

Tampa Bay National Wildlife Refuge Appropriate Use Determinations

An appropriate use determination is the initial decision process a refuge manager follows when first considering whether or not to allow a proposed use on a refuge. The refuge manager must find that a use is appropriate before undertaking a compatibility review of the use. This process clarifies and expands on the compatibility determination process by describing when refuge managers should deny a proposed use without determining compatibility. If a proposed use is not appropriate, it will not be allowed and a compatibility determination will not be undertaken.

Except for the uses noted below, the refuge manager must decide if a new or existing use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility. Uses that have been administratively determined to be appropriate are:

- Six wildlife-dependent recreational uses - As defined by the National Wildlife Refuge System Improvement Act of 1997, the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) are determined to be appropriate. However, the refuge manager must still determine if these uses are compatible.
- Take of fish and wildlife under state regulations - States have regulations concerning take of wildlife that includes hunting, fishing, and trapping. The Service considers take of wildlife under such regulations appropriate. However, the refuge manager must determine if the activity is compatible before allowing it on a refuge.

Statutory Authorities for this policy:

National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. §668dd-668ee. This law provides the authority for establishing policies and regulations governing refuge uses, including the authority to prohibit certain harmful activities. The Act does not authorize any particular use, but rather authorizes the Secretary of the Interior to allow uses only when they are compatible and “under such regulations as he may prescribe.” This law specifically identifies certain public uses that, when compatible, are legitimate and appropriate uses within the Refuge System. The law states “. . . it is the policy of the United States that . . . compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System . . . compatible wildlife-dependent recreational uses are the priority general public uses of the System and shall receive priority consideration in refuge planning and management; and . . . when the Secretary determines that a proposed wildlife-dependent recreational use is a compatible use within a refuge, that activity should be facilitated . . . the Secretary shall . . . ensure that priority general public uses of the System receive enhanced consideration over other general public uses in planning and management within the System” The law also states “in administering the System, the Secretary is authorized to take the following actions: . . . issue regulations to carry out this Act.” This policy implements the standards set in the Act by providing enhanced consideration of priority general public uses and ensuring other public uses do not interfere with our ability to provide quality, wildlife-dependent recreational uses.

Refuge Recreation Act of 1962, 16 U.S.C. 460k. The Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Other Statutes that Establish Refuges, including the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) (16 U.S.C. §410hh - 410hh-5, 460 mm - 460mm-4, 539-539e, and 3101 - 3233; 43 U.S.C. 1631 et seq.).

Executive Orders. The Service must comply with Executive Order 11644 when allowing use of off-highway vehicles on refuges. This order requires the Service to designate areas as open or closed to off-highway vehicles in order to protect refuge resources, promote safety, and minimize conflict among the various refuge users; monitor the effects of these uses once they are allowed; and amend or rescind any area designation as necessary based on the information gathered. Furthermore, Executive Order 11989 requires the Service to close areas to off-highway vehicles when it is determined that the use causes or will cause considerable adverse effects on the soil, vegetation, wildlife, habitat, or cultural or historic resources. Statutes, such as ANILCA, take precedence over executive orders.

Definitions:

Appropriate Use

A proposed or existing use on a refuge that meets at least one of the following four conditions.

- 1) The use is a wildlife-dependent recreational use as identified in the Improvement Act.
- 2) The use contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law.
- 3) The use involves the take of fish and wildlife under state regulations.
- 4) The use has been found to be appropriate as specified in section 1.11.

Native American. American Indians in the conterminous United States and Alaska Natives (including Aleuts, Eskimos, and Indians) who are members of federally recognized tribes.

Priority General Public Use. A compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Quality. The criteria used to determine a quality recreational experience include:

- Promotes safety of participants, other visitors, and facilities.
- Promotes compliance with applicable laws and regulations and responsible behavior.
- Minimizes or eliminates conflicts with fish and wildlife population or habitat goals or objectives in a plan approved after 1997.
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation.
- Minimizes conflicts with neighboring landowners.
- Promotes accessibility and availability to a broad spectrum of the American people.
- Promotes resource stewardship and conservation.

-
- Promotes public understanding and increases public appreciation of America's natural resources and the Service's role in managing and protecting these resources.
 - Provides reliable/reasonable opportunities to experience wildlife.
 - Uses facilities that are accessible and blend into the natural setting.
 - Uses visitor satisfaction to help define and evaluate programs.

Wildlife-Dependent Recreational Use. As defined by the Improvement Act, a use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Beach uses - shelling and fossil collecting (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Beach uses - walking/hiking (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Hiking/walking (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____

Appropriate X ____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Beach uses-sunbathing and swimming from shore (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Boating-non-motorized/human powered (Pinellas NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Concessions (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Mosquito management (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____

Appropriate X ____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Picnicking (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Photography, video, filming, or audio recording (commercial, news and educational) (all refuges)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Research and surveys (all refuges)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____

Appropriate X _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Bicycling (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate** _____

Refuge Manager: _____ Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Boating-other: vessel landings (all refuges)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes X No**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X

Appropriate

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Boating-overnight mooring (Pinellas NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** **No** X

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X **Appropriate**

Refuge Manager: _____ Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Camping (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X ___

Appropriate _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Competitive sporting events (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** **No**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate **Appropriate**

Refuge Manager: _____ Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allow

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Geocaching (Egmont Key NWR)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?		X
(d) Is the use consistent with public safety?		
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X ___

Appropriate _____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Tampa Bay Refuges

Use: Military uses (all refuges)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, Tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?		X
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		
(g) Is the use manageable within available budget and staff?		
(h) Will this be manageable in the future within existing resources?		
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** ____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate X ____

Appropriate ____

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

Appendix F. Compatibility Determinations

Tampa Bay Refuges (Egmont Key, Passage Key, and Pinellas NWRs) Compatibility Determinations

Refuge Uses: The following uses were evaluated to determine their compatibility with the Refuge System's mission and the purpose of the refuges: (1) beach uses - shelling, fossil collecting, and walking/hiking (Egmont Key NWR); (2) beach uses – sunbathing and swimming from shore (Egmont Key NWR); (3) boating - non-motorized/human powered (Pinellas NWR); (4) concessions (Egmont Key NWR); (5) mosquito management (All Refuges); (6) picnicking (Egmont Key NWR); (7) photography, video, filming, or audio recording [commercial, news, and educational] (All Refuges); (8) research and surveys (All Refuges); (9) snorkeling (skin diving)/SCUBA diving (Egmont NWR); and (10) wildlife observation and photography (non-commercial) Egmont Key and Pinellas NWRs). A description of each use and its anticipated biological impact is presented in this Compatibility Determination.

Establishing and Acquisition Authorities:

Egmont Key National Wildlife Refuge

Public Law 93-341 dated July 10, 1974.

Pinellas National Wildlife Refuge

Executive Order 3502 dated June 21, 1921 prohibits disturbance of birds or eggs on Indian Key Migratory Bird Conservation Act (16 U.S.C. section 715-715r)

Passage Key National Wildlife Refuge

Executive Order 3578 dated October 10, 1905.

Refuge Purposes:

Egmont Key National Wildlife Refuge

To administer the refuge in accordance with the National Wildlife Refuge System Administration Act of 1966.

Pinellas National Wildlife Refuge

For lands acquired under the Migratory Bird Conservation Act, as amended, the purpose of the acquisition is: "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

"...suitable for – (1) incidental fish and wildlife-oriented recreational development. (2) the protection of natural resources. (3) the conservation of endangered species or threatened species 16 U.S.C. Section 460k-1 (Refuge Recreation Act)

Passage Key National Wildlife Refuge

“...as a preserve and breeding ground for native birds.” Executive Order 3578, dated October 10, 1905.

National Wildlife Refuge System Mission: The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, is:

“... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

Other Applicable Laws, Regulations, and Policies:

Antiquities Act of 1906 (34 Stat. 225)

Archaeological Resources Protection Act of 1979

Native American Graves Protection and Repatriation Act, as amended

Migratory Bird Treaty Act of 1918 (15 U.S.C. 703-711; 40 Stat. 755)

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715r; 45 Stat. 1222)

Migratory Bird Hunting Stamp Act of 1934 (16 U.S.C. 718-178h; 48 Stat. 451)

Criminal Code Provisions of 1940 (18 U.S.C. 41)

Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; 54 Stat. 250)

Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41; 62 Stat. 686)

Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)

Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)

Wilderness Act (16 U.S.C. 1131-1136; 78 Stat. 890)

Land and Water Conservation Fund Act of 1965

National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.; 80 Stat. 915)

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd, 668ee; 80 Stat. 927)

National Environmental Policy Act of 1969, NEPA (42 U.S.C. 4321, et seq; 83 Stat. 852)

Use of Off-Road Vehicles on Public Lands (Executive Order 11644, as amended by Executive Order 10989)

Endangered Species Act of 1973 (16 U.S.C. 1531 et seq; 87 Stat. 884)

Refuge Revenue Sharing Act of 1935, as amended in 1978 (16 U.S.C. 715s; 92 Stat. 1319)

Emergency Wetlands Resources Act of 1986 (S.B. 740)

The Property Clause of the U.S. Constitution Article IV 3, Clause 2

The Commerce Clause of the U.S. Constitution Article 1, Section 8

The National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57, USC668dd)

Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System, March 25, 1996

Cooperative Agreement Between the U.S. Department of the Interior and the Florida Department of Natural Resources (now Florida Department of Environmental Protection), November 24, 1989.

Memorandum of Understanding between U.S. Fish and Wildlife Service, Chassahowitzka NWR Complex, Tampa Bay Refuges, Homosassa, Florida, and U.S. Coast Guard, St. Petersburg Group, St. Petersburg, Florida, dated February 7, 1984.

Board of Trustees of the Internal Improvement Trust Fund Amendment to Sovereignty Submerged Land Management Agreement No. 750-0013 dated April 7, 1992

Management Agreement for Certain Sovereignty Submerged Lands Surrounding Passage Key National Wildlife Refuge in Manatee County Agreement No. 750-0013 dated February 7, 1986

Compatibility determinations for each description listed were considered separately. Although the preceding sections from "Uses" through "Other Applicable Laws, Regulations and Policies" are only written once within the CCP, they are part of each descriptive use and become part of that compatibility determination if considered apart from the CCP.

(1) Description of Use: Beach Uses – Shelling, Fossil Collecting, and Walking/Hiking (Egmont Key NWR)

Those beaches on Egmont Key NWR that are not closed to the public are available for the activities of walking/hiking, shell and fossil collecting.

Availability of Resources: The cost of allowing these uses on the refuge is absorbed within the operating budget and does not require additional staff for enforcement or other purposes.

Anticipated Impacts of the Use: Removal of certain shells would affect hermit crabs or mollusks that could inhabit them. However, due to the limited number of visitors on the island and the large number of shells that wash ashore, impacts are expected to be minor. Walking on beaches can increase the opportunity of disturbing wildlife, creating litter, or trampling vegetation or nests.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
- Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Regarding shell collection, shells containing live animals may not be taken. No live animals may be removed from shells. These activities are restricted to daylight hours. Certain areas of the refuge may be restricted seasonally for breeding or nesting purposes to protect habitat or for experimental purposes to draw in birds.

Justification: These activities are low impact. Walking and hiking are considered to support wildlife observation of wildlife, which may be enhanced by visiting the open shoreline beaches.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(2) Description of Use: Beach Uses – Sunbathing and Swimming from Shore (Egmont Key NWR)

Those beaches on Egmont Key NWR that are not closed to the public are available for the activities of sunbathing and swimming from shore.

Availability of Resources: The public beaches are maintained by refuge staff and volunteers. Swimming is available at swimmer’s own risk.

Anticipated Impacts of the Use: No significant impacts are anticipated from sunbathing or swimming from shore. Some littering, vandalism, plant removal, and feeding/disturbance of wildlife may occur. Litter that washes in or is left by visitors will be controlled through refuge staff, volunteers, and regular monthly beach cleanups conducted by the citizen support organization.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
- Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Sunbathing and swimming are restricted to areas open to the public away from densely populated areas of nesting birds. These activities will be restricted to daylight hours only. Visitors will be asked to “pack it in, pack it out” and remove their own litter. Pets are not allowed on the island and visitors will be asked to minimize their noise (e.g., blaring radios, screaming) in order to reduce the disturbance to wildlife. Refuge and state park law enforcement patrol of public use areas should continue to minimize violations.

Justification: Although sunbathing and swimming are not wildlife-dependent or priority public uses, wildlife may be seen while sunbathing or swimming.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(3) Description of Use: Boating – Non-motorized/Human Powered (Pinellas NWR)

Motorized boats are prohibited within the refuge boundary around Tarpon, Indian/Bird, and part of Whale Keys. Within the refuge boundary on these islands, only non-motorized/human powered boats, such as canoes and kayaks, are allowed. Persons in watercraft vessels are restricted to paddling, poling, or pedaling as means of propulsion to cross through these waters.

Availability of Resources: The cost of allowing these uses on the refuge is absorbed within the operating budget and does not require additional staff for enforcement or other purposes.

Anticipated Impacts of the Use: Since non-motorized boats are quieter than motor boats, fewer disturbance and noise impacts to wildlife are anticipated than if motor boats were prohibited. Some littering and minor impacts to wildlife or habitat may occur, but these are expected to be minor due to the limited number of persons who visit these islands by non-motorized vessels.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

Use is Not Compatible

Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Boating by non-motorized/human powered vessels is restricted to daylight use only within the refuge boundary of Indian/Bird, Whale, and Tarpon Keys. For anglers, fishing is prohibited within the area between the island shores and the casting distance between the island and their vessel. This is to ensure that birds are not snagged by fishhooks and that monofilament is not caught in vegetation on the island.

Justification: Boating allows access to these islands for wildlife observation, which is a priority public use under the National Wildlife Refuge System Improvement Act of 1997. By restricting boating to non-motorized/human powered vessels, it will cut down the number of visitors within the refuge boundary and it will prevent impacts from oil or gas spills.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(4) Description of Use: Concessions (Egmont Key NWR)

There are presently no concessions on Egmont Key NWR. Concessions are businesses operated by a private enterprise that provide equipment, facilities or other goods or services for the recreational, educational, and/or interpretive enjoyment for the public. A concession, such as a boat tour or ferry, could be used to bring persons to the island.

Availability of Resources: The cost of allowing these uses on the refuge would be absorbed within the operating budget. A special use permit or operating permit may be used to cover any administrative costs of accommodating this use.

Anticipated Impacts of the Use: Small groups led by professional guides or boat crews that are under permit should have minimal impacts on the environment.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
 Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Concessions would only be run under agreement with the Service through operating or special use permits. Concessionaires would be trained to avoid leading their groups in activities that could harm wildlife or habitat.

Justification: Since Egmont Key NWR is an island and the Service has no means to shuttle persons out to the island, a concession would be useful for providing access to the island. The number and activities of visitors could be controlled partly by concessions if they are under a permit system. Regulation of concessions would ensure training of staff for visitor education and safety. Access for the purpose of wildlife-dependent recreation would allow more opportunity for public use.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
 Categorical Exclusion and Environmental Action Statement
 Environmental Assessment and Finding of No Significant Impact
 Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(5) Description of Use: Mosquito Management (All Refuges)

This involves activities undertaken to manage and control mosquitoes, including habitat management.

Availability of Resources: The cost of allowing this use on the refuge is absorbed within the operating budget and does not require additional staff for enforcement or other purposes. Mosquito control operations will be conducted by the Tampa Bay Pilots Association. The refuge will annually review and evaluate mosquito control operations and special use permit compliance.

Anticipated Impacts of the Use: Typically microbial larvicides or aerial sprayings are applied to aquatic habitats where mosquito larvae occur. These compounds pose minimal threats to non-target, vertebrate and invertebrate species. Experimental testing of some microbial larvicides has shown no demonstrated effects of larvicidal applications on other aquatic insects or invertebrates. There are no known mammalian health effects resulting from larvicidal applications.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
- Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: The Tampa Bay Pilots Association currently uses a ground application of bti to standing water on lands leased from the Service at the Pilot Compound on Egmont Key NWR. A Pesticide Use Proposal must be approved for this application on an annual basis.

Justification: If mosquito populations are elevated due to storm events or disease outbreaks, mosquito control may be necessary. Mosquito control is warranted for the health and safety of employees of the refuge, Florida Park Service, and the Tampa Bay Pilots Association, including volunteers and interns working for these agencies.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(6) Description of Use: Picnicking (Egmont Key NWR)

There are presently no picnic facilities (e.g., tables, shelters, and restrooms) available to the public on Egmont Key NWR.

Availability of Resources: Staff resources limit this use as there are no facilities available to the public. The cost of allowing this use on the refuge would be absorbed within the operating budget.

Anticipated Impacts of the Use: No significant impacts are expected since picnicking is restricted to the upland portion of the refuge. Some littering, vandalism, plant removal, and feeding/disturbance of wildlife could occur. Litter would have to be controlled by the placement and collection of refuse containers.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

Use is Not Compatible

Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Picnicking, like all refuge uses, is restricted to daylight hours. Picnicking on the beach/shoreline is discouraged to prevent littering and disturbance to wildlife and trampling of wildlife nests. Some areas of the refuge may be closed to picnicking on a seasonal, temporary, or trial basis for the protection of wildlife and habitat.

Justification: Picnic areas and facilities can provide refuge visitors a place to rest and to observe wildlife around these sites with minimal disturbance to wildlife. Sites could also be developed to allow mobility impaired visitor access to areas where animal life is plentiful. While there are no facilities on the refuge at present, properly placed facilities could be an asset in drawing visitors to certain areas. Interpretive displays could be located at these resting sites.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(7) Description of Use: Photography, Video, Filming, or Audio Recording (Commercial, News, and Educational) (All Refuges)

These activities involve photography, videography, filming, or other recording of sight or sound for public information, educational, or commercial purposes.

Availability of Resources: The cost of allowing these uses on the refuges would be absorbed within the operating budget.

Anticipated Impacts of the Use: Filming from helicopters could affect wildlife, especially nesting birds. The transport of equipment could result in trampling of vegetation or wildlife nests.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

Use is Not Compatible

Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: All commercial activity conducted by an individual or organization, including guiding and outfitting, would be regulated under special use permit. The landing of helicopters would also be regulated under special use permit. Aerial craft is subject to the Federal Aviation Administration's regulations on airspace and height restrictions around wildlife refuges. Some areas are closed to the public. Certain areas of the refuges may be restricted seasonally for breeding or nesting purposes or to protect habitat.

Justification: The use of media is an important tool to promote the wildlife refuge and to facilitate environmental education and awareness of refuge resources, wildlife and habitat. If regulated through special use permit, impacts to wildlife and habitat can be minimized.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(8) Description of Use: Research and Surveys (All Refuges)

This includes scientific research, inventorying or monitoring and scientific collecting conducted by non-refuge personnel on refuge lands. The refuges are often used for biological and historical research, for example, by the Florida Park Service, the Audubon Society, Tampa Bay Watch, and the Egmont Key Alliance.

Availability of Resources: The cost of most field studies is borne by the researchers, with the exception of staff time to review proposals, issue special use permits, and monitor projects. These are considered routine duties of biologists and managers and are absorbed within refuge operating costs.

Anticipated Impacts of the Use: The collection or monitoring of field data during a research project may cause mortality to some target species. Minor habitat and temporary wildlife disturbance may also occur. Research project impacts are minimized by strict monitoring of all projects by refuge personnel.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

Use is Not Compatible

Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: All research proposals are reviewed by staff before approval is given. A special use permit is prepared for each project, specifying the purpose and duration of the project, location of field work, and any special conditions that the permittee is required to follow. Refuge personnel regularly monitor the progress of all field work and all permittees are required to submit an annual report of work accomplished and/or a final report of their study.

Historical research and archaeological investigations by non-Service parties require both Archaeological Resources Protection Act (ARPA) and refuge special use permits. ARPA permit applications are available only from the Regional Historic Preservation Officer. The applicants are required to submit a number of items to initiate the process, which includes identification of the site and/or area of interest, a research proposal, and a resumé for each principal investigator.

Justification: Research is important because it provides the Service with scientific information that can be used to manage natural resources. Species identification, resource inventorying and monitoring provide valuable data for refuge operations. Access to current and state-of-the-art research can aid management decisions.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(9) Description of Use: Snorkeling (Skin Diving)/SCUBA Diving (Egmont Key NWR)

Snorkeling is permitted from the shore and in the seagrass beds on the east side of Egmont Key NWR where there is a vessel exclusion zone. Access to the seagrass beds can be from boats anchored outside the vessel exclusion zone or from visitors walking south along the eastern shoreline of the refuge to the vessel exclusion zone. There is also snorkeling and SCUBA diving on the batteries offshore on the southwestern side of Egmont Key NWR.

Availability of Resources: Snorkeling and diving are activities visitors can conduct at their own risk. There are no lifeguards. No additional costs are required of the refuge to accommodate this use.

Anticipated Impacts of the Use: Disturbance of wildlife or trampling of nests can be expected by visitors walking along the shoreline. These impacts are expected to be minimal and temporary. Snorkelers who walk in the seagrass areas can damage them. Although it is prohibited by refuge regulation, some take of live marine species, especially mollusks, could occur. Since this activity is conducted at the diver's risk, safety concerns include injuries and the potential for heart attacks or drowning of unfit swimmers.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
 Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Snorkeling is allowed from refuge beaches. To access the seagrass beds, snorkelers must walk a distance down the beach before entering the water. This will limit the number of persons that enter the seagrass beds. Many snorkelers are trained not to stand on the bottom or to touch marine life or any living organisms. An interpretive sign might be used at the access point along the beach to educate snorkelers. If snorkelers come to the refuge via a regulated concession, they could be provided with an educational program on snorkeling etiquette and how to minimize damage to seagrasses along with an interpretive program on marine resources and the value of seagrass beds. State regulations for swimming and diving apply. Skin and SCUBA divers should carry and use a dive flag signaling that divers are down. This prohibits boaters from coming within 100 feet of a diver.

Justification: Snorkeling provides an opportunity for wildlife observation of the marine environment. Learning about an environment and enjoying time in it is a means of instilling a value of stewardship among visitors. Although this is not a priority public use, it provides a means of wildlife observation.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
 Categorical Exclusion and Environmental Action Statement
 Environmental Assessment and Finding of No Significant Impact
 Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

(10) Description of Use: Wildlife Observation and Photography (Non-commercial – Egmont Key and Pinellas NWRs)

Non-consumptive wildlife observation uses are defined as the viewing of fish, wildlife, plants, and habitat, including the provision of access to viewing areas. Photography involves photographing natural or cultural resources, or public uses of these resources for individual recreational purposes rather than news, educational, or commercial purposes. Wildlife observation can also include commercial guiding or outfitting of refuge visitors to view fish, wildlife, plants, or their habitats (including provisions of access to viewing areas). There are presently no refuge-sanctioned guides or outfitters for wildlife observation and photography excursions to the island.

Availability of Resources: The cost of allowing this use on the refuge would be absorbed within the operating budget. Trails and beaches are maintained for refuge purposes and recreational use. The addition of platforms, photography blinds or towers to encourage these uses on the refuge would involve new construction costs. With a fee program, the refuge could receive 80 percent on entrance fee receipts. This may be used to support the six priority public uses identified in the National Wildlife Refuge Improvement Act. If outfitters and guides were allowed under special use or operators' permits as part of a concession, then there may be fees involved to cover the administrative costs of operating a permit system.

Anticipated Impacts of the Use: Some violations of refuge regulations are anticipated, such as wildlife disturbance, collecting, poaching, plant removal, littering and vandalism.

Public Review and Comment: Compatibility determinations for the Tampa Bay Refuges will be available for public review as part of the Draft CCP/EA review. The public will be notified via a notice of availability in the *Federal Register*, refuge postings, and newspaper articles.

Determination (check one below):

- Use is Not Compatible
 Use is Compatible With Following Stipulations

Stipulations Necessary to Ensure Compatibility: Park (Egmont Key) and refuge patrol of public use areas should minimize violations of refuge regulations. The refuges are closed overnight. Certain areas of the refuge may be restricted seasonally for breeding or nesting purposes or to protect habitat.

Justification: These are priority public uses under the National Wildlife Refuge System Improvement Act.

NEPA Compliance for Refuge Use Decision: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
 Categorical Exclusion and Environmental Action Statement
 Environmental Assessment and Finding of No Significant Impact
 Environmental Impact Statement and Record of Decision

Mandatory 15-year Re-Evaluation Date:

Approval of Compatibility Determinations

The signature of approval is for all compatibility determinations considered within the CCP for the Tampa Bay Refuges (Egmont Key, Pinellas, and Passage Key). If one of the descriptive uses is considered for compatibility outside of the CCP, the approval signature becomes part of that determination.

Refuge Manager:

(Signature and Date)

Regional Compatibility
Coordinator:

(Signature and Date)

Refuge Supervisor:

(Signature and Date)

Regional Chief, National
Wildlife Refuge System,
Southeast Region:

(Signature and Date)

Appendix G. Intra-Service Section 7 Biological Evaluation

REGION 4

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

Originating Person: Joyce M. Kleen

Telephone Number: 352/563-2088 x 211; **E-Mail:** joyce_kleen@fws.gov

Date: September 15, 2008

PROJECT NAME (Grant Title/Number): Tampa Bay Refuges (Egmont Key, Pinellas, and Passage Key) Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA).

I. Service Program:

- Ecological Services
- Federal Aid
 - Clean Vessel Act
 - Coastal Wetlands
 - Endangered Species Section 6
 - Partners for Fish and Wildlife
 - Sport Fish Restoration
 - Wildlife Restoration
- Fisheries
- Refuges/Wildlife

II. State/Agency: Florida, U.S. Fish and Wildlife Service

III. Station Name: Tampa Bay Refuges (Egmont Key, Pinellas, Passage Key)

IV. Description of Proposed Action (attach additional pages as needed):

Implementation of the Comprehensive Conservation Plan.

The U.S. Fish and Wildlife Service developed a Draft CCP/EA for the Tampa Bay Refuges, which include Egmont Key, Pinellas, and Passage Key, totaling 639 acres.

The proposed alternative identified in the Draft CCP/EA outlines actions to improve refuge management. It supports the purposes for which the refuges were established and the missions of the refuges and Refuge System. The Draft CCP/EA identifies six broad goals for habitat and wildlife, threatened and endangered species, visitor services, cultural resources, wilderness, and administration. Specific objectives and strategies for these goals are detailed. The goals, objectives, and strategies were developed to support international, national, and regional conservation plans and initiatives in partnership with other agencies, such as the Florida Fish and Wildlife Conservation Commission.

V. Pertinent Species and Habitat:

A. **Include species/habitat occurrence map:** See Figures 14, 15, 16 in the Draft CCP/EA.

B. **Complete the following table:**

SPECIES/CRITICAL HABITAT	STATUS ¹
Atlantic loggerhead turtle	T
Atlantic green turtle	E
Piping plover/CH-Egmont	E
Wood stork	E
West Indian manatee	E

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. **Location (attach map):** See Figures 1 and 2 in the Draft CCP/EA

A. **Ecoregion Number and Name:** Ecoregion 32, North Florida Ecosystem

B. **County and State:** Hillsborough, Manatee, and Pinellas Counties in Florida

C. **Section, township, and range (or latitude and longitude):**

T 33 S, R 15 E, S 23, 24, 25, 26-Egmont

T 33 S, R 16 E, -Passage

T 31 S, R 16 E, S 15; T 32 S, R 15 E, S 20, 29, 32; & T 32 S, R 16 E, S 27, 28, 33, 34-Pinellas

D. **Distance (miles) and direction to nearest town:**

Less than 2 miles southwest of St. Petersburg, Florida

E. Species/habitat occurrence:

Atlantic loggerhead turtles nest on the beaches around the perimeter of Egmont Key NWR. One nest was also documented on Passage Key NWR in 1995. Atlantic green turtles are occasional visitors to the sea grass beds along the east side of Egmont Key NWR and may be seen in the coastal waters of Passage Key and Pinellas NWRs.

West Indian manatees forage in the sea grass beds along the east side of Egmont Key NWR and may also be found in the coastal waters surrounding Passage Key and Pinellas NWRs.

Piping plovers have been documented on the beaches of Egmont Key NWR during the fall months and occasionally during the winter. The beach is designated as critical habitat for piping plovers.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. B (attach additional pages as needed):

SPECIES/ CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Atlantic loggerhead turtle	The project is not likely to adversely affect loggerheads.
Atlantic green turtle	The project is not likely to adversely affect green turtles.
Piping plover/CH-Egmont	The project is not likely to adversely affect piping plovers.
Wood stork	The project is not likely to adversely affect wood storks.
West Indian manatee	The project is not likely to adversely affect manatees.

Beach renourishment and protection will benefit nesting loggerhead sea turtles and wintering piping plovers by providing more nesting habitat for loggerheads and more wintering habitat for piping plovers.

Protection of the sea grass beds near Egmont Key NWR and surrounding Pinellas NWR will benefit manatees and green sea turtles.

Habitat restoration of the mangrove islands within Pinellas NWR will provide more habitat for wood storks.

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/ CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Atlantic loggerhead turtle	Beach renourishment projects will not occur during loggerhead nesting season (summer months).
Atlantic green turtle	No actions to mitigate/minimize impacts are needed for green turtles.
Piping plover/CH-Egmont	Beach renourishment projects may occur during the fall and winter when plovers are present, which may temporarily displace plovers. The renourishment projects will ultimately provide more beach habitat for the plovers.
Wood stork	No actions to mitigate/minimize impacts are needed for wood storks.
West Indian manatee	No actions to mitigate/minimize impacts are needed for manatees.

Beach renourishment projects will occur during the fall and winter when loggerhead turtles are not nesting. The additional habitat provided by the extra sand will provide more beach for the turtles to nest and is critical to loggerhead nesting success. The additional sand will protect the incubating eggs from high surf and waves caused by high tides, tropical storms, and hurricanes.

These same renourishment projects will be occurring during the fall and winter when piping plovers are present, which may cause the birds to be temporarily displaced or they may temporarily reduce the availability of invertebrates. The addition of the new sand will ultimately provide more habitat for piping plovers to winter.

Appendix H. Wilderness Review

The Wilderness Act of 1964 defines a wilderness area as an area of federal land that retains its primeval character and influence, without permanent improvements or human inhabitation, and is managed so as to preserve its natural conditions and which:

1. generally appears to have been influenced primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
2. has outstanding opportunities for solitude or primitive and unconfined types of recreation;
3. has at least 5,000 contiguous roadless acres or is of sufficient size to make practicable its preservation and use in an unimpeded condition; or is a roadless island, regardless of size;
4. does not substantially exhibit the effects of logging, farming, grazing, or other extensive development or alteration of the landscape, or its wilderness character could be restored through appropriate management at the time of review; and
5. may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The lands within Tampa Bay Refuges were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964.

WILDERNESS REVIEW – PINELLAS, EGMONT AND PASSAGE KEYS NATIONAL WILDLIFE REFUGES JANUARY 12, 2005

The Service's comprehensive conservation planning team for the Tampa Bay Refuges met at Chassahowitzka National Wildlife Refuge (NWR) on January 12, 2004, to discuss the refuges' wilderness review. The review team included:

- Jim Kraus, Refuge Manager
- John Kasbohm, Assistant Refuge Manager
- Joyce Kleen, Wildlife Biologist
- Mary Morris, Natural Resource Planner
- Richard Meyers, Assistant Refuge Ranger
- Sarah Palmisano, Refuge Operations Specialist
- Deborah Jerome, Wilderness Coordinator, Regional Office (via conference call)

The wilderness review is a required component of the Comprehensive Conservation Plan (CCP). The Wilderness Act defines a Wilderness Area as an area of federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is managed so as to preserve its natural conditions as stated above.

There is a three-phase process for conducting a wilderness review: inventory, study and recommendation. During the inventory phase of the wilderness review, the emphasis is on an assessment of wilderness character as defined by the above criteria within the inventory unit. Lands that meet the above criteria will be designated as wilderness study areas.

The determination to recommend (or not recommend) a wilderness study area to Congress for wilderness designation will be made through the CCP decision-making process.

The team discussed land status and ownership. The Passage Key NWR Wilderness was designated by Congress under Public Law 91-504 on October 23, 1970. The entire refuge portion of the island, estimated at 36.37 acres, but now experiencing erosion, is designated as a Wilderness Area. Since Passage Key NWR is already a Wilderness Area and since this area cannot be expanded, it is not included in this summary as a wilderness inventory unit. Indian/Bird and Tarpon Keys are not owned in fee simple. They are leased from Pinellas County; therefore, they are not included as wilderness inventory units and they are not considered for wilderness study area designation.

The team identified wilderness inventory units potentially meeting the wilderness study area criteria and these units are identified in Table 18 and Figure 19. All of the units identified meet criterion 5 above since they are roadless islands.

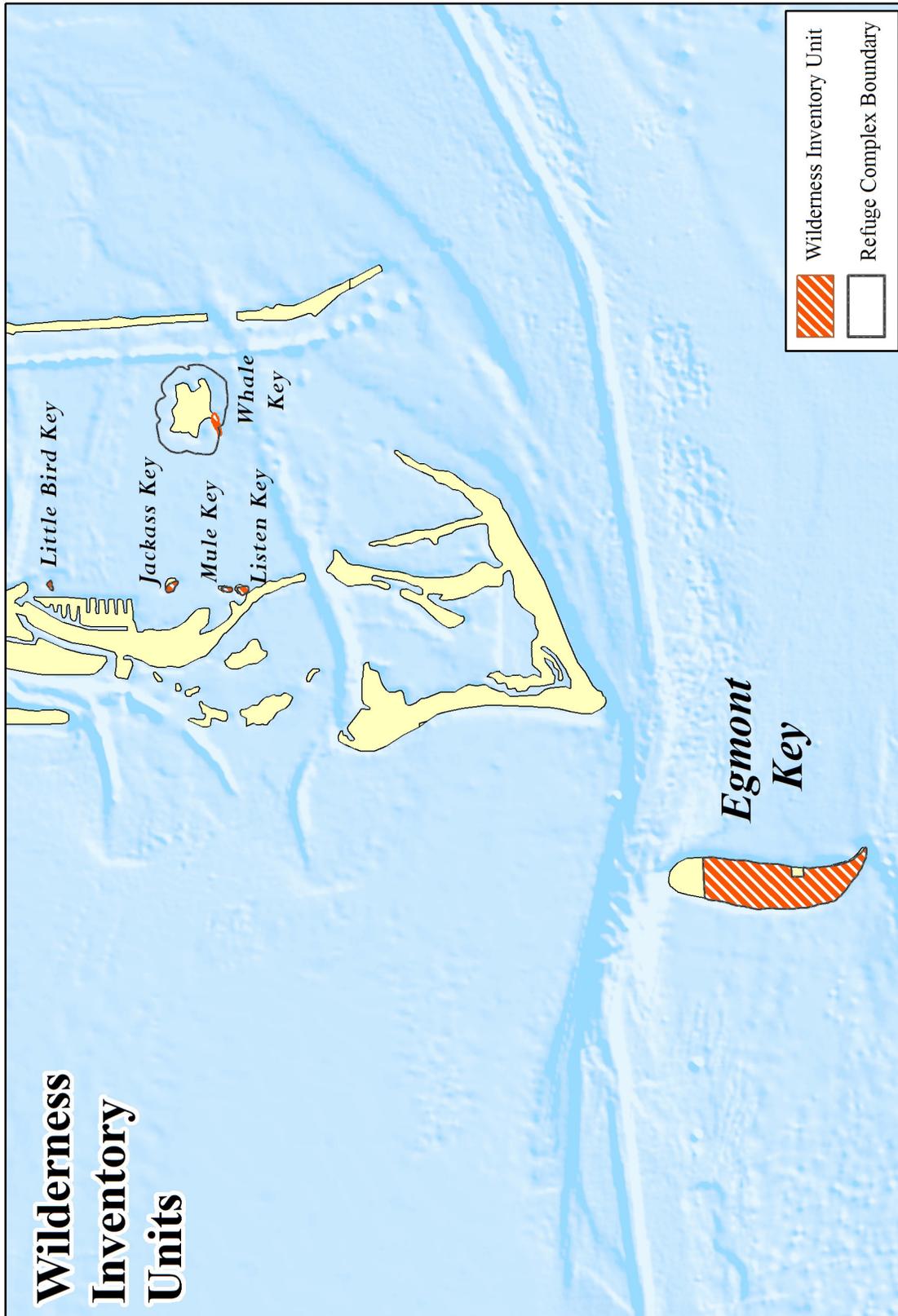
Table 18. Wilderness Inventory Units – Tampa Bay Refuges

<u>Unit</u>	<u>Acreage</u>
Egmont Key	328.29
Little Bird Key	1.24
Jackass Key	4.31
Mule Key	0.07
Listen Key	3.99
Whale Key	2.80

Wilderness Management

The wilderness management policy and regulations allow motorized access and use of mechanized equipment for administrative purposes only if such uses are the minimum necessary to accomplish wilderness objectives. For the purpose of analysis in the Draft CCP/EA, managers should assume that authorization of such uses would be temporary and rare in a wilderness area. If such restrictions would significantly limit the Service’s ability to accomplish other resource management objectives, these impacts should be fully described in the environmental consequences chapter of the Draft CCP/EA and would obviously be a factor for consideration in selecting a preferred alternative.

Figure 19. Tampa Bay Refuges wilderness inventory units



Resource Management Issues

Fire Management – Passage Key and Pinellas NWRs do not need fire suppression or prescribed burning. Passage Key NWR has very little vegetation and the mangrove keys of Pinellas NWR are wet. Egmont Key NWR has had seven known fires (wild or arson) since the time it became a refuge in 1974. The Fire Management Plan dated May 25, 2001, covers wildfire contingency planning, but not prescribed burning. As part of the ongoing refuge operations, a burn prescription for Egmont Key NWR will be written.

Endangered Species - There are no known federally listed species on these islands, although there may be some undocumented, occasional use of some islands/keys by wood storks.

Public Use - Public use is primarily on Egmont Key NWR, which has an extensive beach area. Public uses, such as boating, sailing, and fishing, occur in the surrounding waters and interior tidal creeks. The keys and interior lagoon of Tarpon Key within Pinellas NWR are closed to public use to protect nesting and resting birds, but fishing is permitted in waters surrounding these islands. Passage Key NWR is also closed to public use to protect nesting and resting birds.

Navigable Waters - All of the inventory units are bounded by navigable waters which are sovereign state land. The Service has limited authority to restrict activities, such as motor boating, on navigable water bodies.

Summary of Wilderness Inventory Findings

The wilderness review inventory team identified six wilderness inventory areas on the Tampa Bay Refuges (Table 18). Egmont Key NWR is a sandy beach island located in the Gulf of Mexico at the mouth of Tampa Bay. All five keys within Pinellas NWR are small, mangrove keys located in Tampa Bay. Small, mangrove islands generally do not meet the requirement of having “outstanding opportunities for solitude or primitive and unconfined type of recreation” (criterion 2 above).

The findings for each of the inventory units identified in Table 18 are summarized as follows:

Egmont Key NWR (328 acres) does not meet the criteria for a wilderness study area. It does not meet criterion 5 (a roadless island of any size), since it contains primitive roads and the remains of historic roads. Further, Egmont Key NWR does not meet criterion 4, since it contains many structures, including the remains of Fort Dade. It has an historically significant lighthouse on the island that is contained on the U. S. Coast Guard property. Out parcels on the island include the 55-acre Coast Guard tract and the 5-acre Tampa Bay Pilots housing compound. The Pilots lease another 5 acres from the refuge. Criterion 2 is also not applicable to Egmont Key NWR. Heavy public use limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience. The island is close to a major shipping channel that goes to the Port of Tampa. Large vessel traffic is frequent around the island. The pilot boats, private vessels, and tour operations also operate around the island.

Little Bird Key (1 acre) meets criterion 5 above for a wilderness study area (a roadless island of any size), but could not be practicably managed as wilderness because of its location and close proximity to homes, Highway 693, and heavy motor boating activity. This heavy public use around the island, combined with the size of the island, limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience.

Jackass Key (4 acres) meets criterion 5 above for a wilderness study area (a roadless island of any size), but could not be practicably managed as wilderness because of its location and close proximity to urban areas, Highway 693, and heavy motor boating activity. This heavy public use around the island, combined with the size of the island, limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience.

Mule Key (0.7 acres) meets criteria 5 above for a wilderness study area (a roadless island of any size), but could not be practicably managed as wilderness because of its location and close proximity to homes, Highway 693, and heavy motor boating activity. This heavy public use around the island, combined with the size of the island, limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience.

Listen Key (4 acres) meets the criterion 5 above for a wilderness study area (a roadless island of any size), but could not be practicably managed as wilderness because of its location and close proximity to homes, Highway 693, and heavy motor boating activity. This heavy public use around the island, combined with the size of the island, limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience.

Whale Island (3 acres) meets the criterion 5 above for a wilderness study area (a roadless island of any size), but could not be practicably managed as wilderness because of its location and close proximity to urban areas, I-275 and the Sunshine Skyway Bridge, and heavy motor boating activity. This heavy public use around the island combined with the size of the island limits the opportunities for individuals to enjoy solitude or a primitive and unconfined recreational experience.

Recommendation

It is the recommendation of the team that none of the six inventory units described in the preceding section should be designated as wilderness study areas.

Appendix I. Refuge Biota

Priority Bird Species

Mangrove Nesting and Roosting Waterbirds

All the species treated in this section are restricted to nesting on Pinellas NWR, with the exception of brown pelicans that also nest on Egmont Key NWR and Passage Key NWR (before it was lost to a hurricane). Nesting on Pinellas NWR occurs in mangrove woodlands, currently mostly on Little Bird Key. Formerly, nesting occurred widely on other keys, especially on Tarpon and Whale Keys, but now at greatly reduced levels.

Tarpon Key, one of the islands within Pinellas NWR, was a significant nesting, resting, and feeding area for a variety of colonial nesting waterbirds, including white ibis, reddish egrets, and roseate spoonbills. Very little nesting has been documented since 2002, when consistent predator control efforts ceased and this colony succumbed to raccoons and possibly fish crows. In addition, some of the mangrove habitat has been lost due to erosion from boat wakes, storm tides, tropical storms, and hurricanes. Although these islands are closed to all public use, illegal access by the public still occurs and may cause birds to abandon their nests or flush from their nests, allowing predators to move in.

The late Rich Paul, National Audubon Society-retired, reviewed Audubon's data for bird populations in Tampa Bay and Pinellas County. Audubon's data were compared with data from Jim Rodgers, Florida Fish and Wildlife Commission, and any disparities were clarified and resolved.

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates the following species nesting in Tampa Bay (most on refuges) should be considered as in need of conservation attention in refuge planning:

Species of Conservation Importance (Concern vs. Stewardship vs. other, Action level, species, Combined Score, whether or not State listed, Refuge [2003] pairs, and percentage of 2003 pairs compared with Tampa Bay overall, compared with estimate of total pairs in BCR 31, and compared with estimate of total pairs in Southeast US Region; then percentage of 2003 pairs overall in Tampa Bay with BCR 31 and Southeast US). Percentages over 5 percent are highlighted to indicate high responsibility locally and regionally for Tampa Bay Refuges.

Conservation Concern Species

Critical Recovery

Wood Stork (Combined Score 19), also Federally Endangered and State listed (0/0/0, 8/5)

Immediate Management

*Reddish Egret (Combined Score 23), also State listed (**5**/1/<1, 18/5)

*Roseate Spoonbill (Combined Score 17), also State listed (**8**/<1/<1, 36/6)

Management Attention

*Brown Pelican (Combined Score 20), also State listed (**13**/2/<1, 12/3)

Tricolored Heron (Combined Score 19), also State listed (1/1/<1, **63**/3)

White Ibis (Combined Score 18), also State listed (0/0/0, **45**/12)

Glossy Ibis (Combined Score, 17) (0/0/0, **47**/14)

Anhinga (Combined Score 16) (0/0/0, **11**/4)

Great Blue Heron (Combined Score 16) (**18/2**/**<1**, **13**/**<1**)
Green Heron (Combined Score 16) (4/**<1**/**<1**, **<1**/**<1**)
Yellow-crowned Night-Heron (Combined Score 16) (3/**<1**/**<1**, 11/1)
*Great Egret (Combined Score 15) (**6**/**<1**/**<1**, **8**/1)
Little Blue Heron (Combined Score 15), also State listed (3/**<1**/**<1**, **14**/1)

Conservation Stewardship
Planning and Responsibility

*Double-crested Cormorant (**21**/2/2, **12**/9)
Snowy Egret, also State listed, (4/2/**<1**, **38**/3)

Other species

Cattle Egret (**<1**/**<1**/**<1**, **18**/2)
Black-crowned Night-Heron (13/2/**<1**, 18/2)

*Tampa Bay Refuges have high responsibility (>5%) for supporting all Tampa Bay populations.
**Tampa Bay Refuges have high responsibility (>50%) for supporting all Peninsular Florida (BCR 31) populations.

Regionally, reddish egrets are the highest priority species among long-legged waders found nesting in Tampa Bay. They have not increased overall since the stoppage of the millinery trade. The Tampa Bay area supports the northernmost breeding population along Florida's Gulf coast and includes at present between 60 and 85 pairs. This population has stabilized in the last few years.

Federally endangered wood storks are not nesting on any refuge lands in the Tampa Bay area, but they do nest in Tampa Bay.

Roseate spoonbills regionally appear to be doing well, but there is concern for the species in peninsular Florida (especially south Florida). Tampa Bay populations may be important as the northernmost breeding population along Florida's Gulf coast.

Brown pelicans seem to be doing alright elsewhere in the southeast, with the exception of some areas in Florida (and South Carolina). Some Florida populations are apparently undergoing population declines. Brown pelicans are susceptible to entanglement in monofilament line; islands near fishing piers and boating passes seem to be the worst affected. Pelicans may be attempting to gather monofilament as fine material for nests, thus either getting entangled, or distributing monofilament throughout nesting areas.

Tricolored herons are of increasing concern regionally and in Florida. Because this species is most numerous in coastal habitats, Tampa Bay Refuges provide significant potential for foraging and nesting habitat.

White ibis are also of some regional concern, but while the species does breed in Tampa Bay, none are presently nesting on Pinellas NWR proper. This is a wandering species where numbers can fluctuate greatly locally depending on water conditions throughout the state/region. This area can provide important nesting sites when conditions inland are poor. For example in 2003, 18,000 pairs nested in Tampa Bay due to poor conditions at historical colonies in the Everglades. More recently, white ibis actually nested on Egmont Key NWR annually since 2005, for the first time known to the present refuge staff (i.e., during the last 18 years.)

Yellow-crowned night herons nest at edges and are vulnerable to fish crows. They are crustacean specialists and have limited foraging areas. Black-crowned night herons are more widespread and not of much concern overall, but colonies don't exist in the thousands like they used to. Both species nest on Tarpon and Little Bird Keys, Pinellas NWR and also on Egmont Key NWR.

Although not breeding in Tampa Bay, the keys in Pinellas NWR may represent important post-breeding roost sites for the magnificent frigatebird.

The two main short-term management issues identified during the Biological Review affecting mangrove nesting species are: (1) depredation, which within recent years (when predator control has slacked off), has led to near complete abandonment of Tarpon and Whale Keys (among other islands on the refuge); and (2) through law enforcement presence the need to ensure that human disturbance is not a factor where and when waterbirds are nesting on the refuge. In addition to the above two major issues, three other long-term issues need to be considered: (1) island stabilization through renourishment; (2) removal of exotic vegetation; and (3) reduction of monofilament lines causing mortality.

Beach-Nesting Waterbird and Shorebird Species

As with mangrove nesting waterbirds, the late Rich Paul, National Audubon Society-retired, reviewed Audubon's data for populations of beach nesting species in Tampa Bay and Pinellas County. Audubon's data was compared with data from Jim Rodgers, Florida Fish and Wildlife Commission, and any disparities were clarified and resolved. Within Tampa Bay, Egmont Key NWR and Passage Key NWR support a large majority of nesting terns and laughing gulls (while these species, other than brown pelican; do not occur on Pinellas NWR).

Approximately 38,000 pairs of birds nested on Egmont Key's beaches in 2007, up from 50 pairs in 1998. Brown pelicans, which had nested on Passage Key, began nesting on Egmont Key in 2000 for the first time in 17 years. Disturbance by people entering closed areas has caused total failure of all nesting colonies in past years. Continued efforts by volunteers, State Park Service staff, and refuge law enforcement to keep people out of closed areas, has allowed birds to successfully nest without human disturbance. Unfortunately, birds are still subject to loss of habitat and nests resulting from other forces-predators, high tides, tropical storms, and hurricanes.

Approximately 3,000 pairs of birds, including laughing gulls, royal terns, sandwich terns, and black skimmers, nested on Passage Key through 2004. In 2005, Passage Key was reduced to a sandbar. Over the past 100 years, this island refuge has been reduced from 36 acres due to the effects of high tides, tropical storms, and hurricanes. This island is closed to the public year-round to protect nesting, resting, and migrating birds, but illegal access by the public continues to cause birds to abandon their nests. Since this refuge is designated wilderness, any attempt to restore it through beach renourishment requires additional considerations on impacts to wilderness character.

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates the following species nesting in Tampa Bay (most on refuges) should be considered as in need of conservation attention in refuge planning:

Species of Conservation Importance (Concern vs. Stewardship vs. other, Action level, species, Combined Score, whether or not State listed, Refuge [2003] pairs, and percentage of 2003 pairs compared with Tampa Bay overall, compared with estimate of total pairs in BCR 31, and compared with estimate of total pairs in Southeast US Region; then percentage of 2003 pairs overall in Tampa

Bay with BCR 31 and Southeast US. Percentages over 5% are highlighted to indicate high responsibility locally and regionally for Tampa Bay Refuges.

Conservation Concern Species

Critical Recovery

Snowy Plover (Combined Score 20), also State listed (0/0/0, 5/<1)

Immediate Management

None

Management Attention

Wilson's Plover (Combined Score 21) (0/0/0, **13/2**)

American Oystercatcher (Combined Score 21), also State listed (3/1/<1, **40/3**)

*Brown Pelican (Combined Score 20), also State listed (**14/2/<1**, **12/3**)

*Black Skimmer (Combined Score 20), also State listed (**18/15/2**, **82/11**)

*Least Tern (Combined Score 19), also State listed (**8/<1/<1**, **6/1**)

Sandwich Tern (Combined Score 17) (75/66/1**, **89/2**)

Laughing Gull (Combined Score 16) (61/50/74**, **82/12**)

Gull-billed Tern (Concern Score 16) (0/0/0, **53/1**)

Planning and Responsibility

Willet (Conservation Score 16) (2/<1/<1, <1/<1)

Conservation Stewardship

Planning and Responsibility

Royal Tern (82/82/4**, **100/5**)

Other species

Black-necked Stilt (0/0/0, <1/<1)

Caspian Tern (0/0/0, **49/5**)

*Tampa Bay Refuges have high responsibility (>5%) for supporting all Tampa Bay populations.

**Tampa Bay Refuges have high responsibility (>50%) for supporting all Peninsular Florida (BCR 31) populations.

Beyond this conservation list above, it is instructive to divide beach nesting species into two types: (1) those that do not tend to occur in huge colonies, but are more spread out and (2) those that do occur only in large colonies generally on very isolated islands that are completely free of mammalian predators. The first group tends to have the species undergoing the most severe declines today, while the second group of species appears largely stable regionally, but only will continue to be stable if known colonies are all protected against predators becoming established and from increasing levels of human disturbance.

Islands and Mainland Beaches (most threatened as they do not tend to concentrate in huge colonies and are more subject to problems associated with nesting sites readily accessible to mammalian predators and high public use on beaches):

Snowy plover
Wilson's plover
American oystercatcher
Gull-billed tern
Least tern
Black skimmer

Isolated Islands (these species do well where islands are protected/managed; no predators and minimal human disturbance):

Brown pelican
Royal tern
Sandwich tern
Laughing gull
Caspian tern (not particularly common nesting species in the Southeast, but where they do nest they occur only with royals and/or sandwich terns)

Among nesting shorebirds, plovers and oystercatcher are the highest priority species, but presently only American oystercatcher is known to nest on Egmont and Passage Keys. Wilson's plovers are not nesting on any refuge lands, but the potential exists. Snowy plovers also are not nesting on refuge lands in Tampa Bay, but do occur elsewhere in Tampa Bay.

Among the colonial nesting species, black skimmers and least terns are the highest priority species nesting on Egmont and Passage Keys and these refuges may be among the most secure nesting sites in Tampa Bay. These two species are undergoing declines or are staying relatively stable by moving nesting off of beaches to gravel roof-tops (especially least tern) throughout the southeast, including the Tampa Bay area. They generally have poor reproduction on beaches due to constant depredation and high human disturbance, but their reproductive rates on rooftops may not be much better on average. Roof-top colonies are subject to large-scale failure associated with major storm events. Also, when colonies start to become large they are more likely to attract avian predators that can cause failure and abandonment (examples of avian predators on rooftops may include fish crows, cattle egrets, and even burrowing owls). Beyond these issues, now it is apparent that gravel on roof-tops are being phased out across the Southeast and specifically in the Tampa Bay area (DeVries and Forsy 2004, Loss of tar and gravel rooftops in Pinellas County, Florida, and potential effects on least tern populations, *Florida Field Naturalist* 32:1-41). As this phase out occurs, whatever higher level of overall reproductive success that may occur on roof-tops over beach habitats will be lost, highlighting the increasing importance of minimizing human disturbance especially on Egmont Key (both within closed areas as well as where compatible public use is now allowed).

Large and important colonies of brown pelicans, laughing gulls, royal and sandwich terns occur on Egmont Key and formerly on Passage Key. In particular among these species, sandwich tern is worth some specific attention on Tampa Bay Refuges from both a Tampa Bay and southeast regional perspective. With close to 90% of sandwich tern pairs in Peninsular Florida occurring in Tampa Bay, and 66% of those on Egmont and Passage Keys, it is clear that refuge colonies for this species are extremely important to maintain. Recent observations during the last two breeding seasons may be cause for some concern with respect to this species. Sandwich terns, at least on Egmont Key, typically settle in first to form nesting colonies and they are soon surrounded by large numbers of royal terns, but during the last two nesting seasons the opposite has been observed with sandwich terns forming a ring around settled in royal terns. This appears important as royal terns are easily

able to fend off depredating fish crows and when they form the exterior of the mixed species colony they also protect sandwich terns from depredation. While on the review in 2004, the team observed adult sandwich terns on the edge of the mixed species colony being dragged off of their eggs by fish crows with other fish crows then being able to access the eggs resulting in depredation. Whether this depredation is becoming serious for sandwich terns at Egmont Key is unclear, but it is clear when nesting sandwich terns form the edge of the mixed species colony they suffer from a higher level of depredation than experienced by this species when it forms the core of the mixed species colony. Why sandwich terns are forming a ring around nesting royal terns the last two nesting seasons is unknown and this should be monitored in subsequent years and perhaps a research need identified if this pattern continues. Regionally, Tampa Bay does not presently represent a large proportion of nesting sandwich terns (less than 5%), but that may be changing as the world's largest sandwich tern colony within Breton National Wildlife Refuge, Louisiana, has been dramatically reduced since the 1998 hurricane season (decreased by half), and perhaps will be reduced further still after the 2005 hurricane season, thus raising the importance of other relatively large colonies, such as on Egmont and Passage Keys. There is not an indication that nesting pairs from Breton NWR are shifting to Tampa Bay (yet), but this is something to watch for. Nevertheless, the percentage of regional pairs occurring in Tampa Bay may need to be re-assessed if the 2006 nesting season indicates further declines in Louisiana and relative stability in Tampa Bay.

Laughing gulls also deserve some special mention. According to Paul's data, laughing gulls have shown a 60% decline in the last 25 years in Florida, which may be more closely related to better waste management practices, reducing readily available foraging areas for gulls, more than anything else. Nevertheless, one-half of Peninsular Florida's population of laughing gulls occurs on Egmont Key and formerly on Passage Key and are therefore identified here as in need of at least some responsibility attention, if not also management attention. However, such management attention needs to be kept in perspective with the requirements of the other beach nesting species on Egmont and Passage Keys. First, laughing gulls require some level of vegetation cover in line with brown pelican requirements, but in contrast to the requirements of open sand for nesting terns, skimmers, and oystercatchers. In addition, laughing gulls can be serious nest predators on adjacent nesting terns, skimmers, and shorebirds. Generally, laughing gulls are not considered a serious problem unless something else is disturbing tern and skimmer colonies or oystercatcher pairs on Egmont and Passage Keys (e.g., increasing levels of human disturbance). The appropriate balance in managing vegetation on Egmont Key should be based on the needs of brown pelican as much or more than laughing gull, but overall the needs of terns and skimmers for open sand for nesting should take precedent overall. Passage Key is designated wilderness and regularly subject to overwashing and therefore no active vegetation management is considered necessary for that refuge. On balance, the review team does not recommend any special attention for laughing gulls at Egmont Key beyond protection from disturbance, which benefits all beach-nesting species.

The first priority is to maintain and conserve nesting habitats for terns, skimmers, and oystercatchers on both Egmont and Passage Keys. The second priority is to maintain and conserve breeding and post-breeding roosting and foraging habitat for these species. The two main short-term management issues identified during the Biological Review affecting beach nesting species on Egmont and Passage Keys are (1) depredation which within recent years (when predator control has slacked off) has led to near complete abandonment of Tarpon and Whale Keys (among other islands on the refuge) and (2) through law enforcement presence the need to ensure that human disturbance is not a factor where and when waterbirds are nesting on the refuge. In addition to the above two major issues, three other long-term issues need to be considered: (1) island stabilization through renourishment, (2) vegetation management on Egmont Key, and (3) reduction of monofilament killing birds.

Disturbance. There are two wildlife sanctuaries, totaling 97 acres, which are located on Egmont Key. One is at the southern end of the island to protect nesting and resting birds and the second is along the eastern shoreline to protect feeding birds. Keeping visitors out of these closed areas is vital to the protection of nesting birds. If humans intrude on a nesting colony, adult birds flush from their nests, making their eggs and/or young vulnerable to predation by crows, laughing gulls, or excessive heat from the sun.

In addition, at least American oystercatchers nest outside of sanctuary areas and may have difficulty bringing off broods if there is excessive public use near nest sites. A regular law enforcement presence is necessary to ensure that otherwise compatible public use is conducted in ways to avoid disturbance of nesting, roosting, and foraging birds outside of sanctuaries, especially American oystercatchers. With minimal disturbance, it is possible that additional least terns and black skimmers may nest outside of sanctuary areas.

Depredation. Egmont Key has no raccoons and any that make it to the island are removed. Rats have invaded Egmont Key during beach renourishment in 2006 and are being controlled. Four cats remain within the Tampa Bay Pilots' Compound and they have been neutered. Unleashed pets, mainly dogs, cause problems with disturbing colonial nesting birds and can kill the adult birds. Although the State Park allowed dogs on a 6-foot leash, refuge regulations prohibited pets but was not being enforced. "No pet" signs have been posted now throughout the island. Fish crows are predated on ground-nesting birds on Egmont and Passage Keys. Ticks may be causing problems for adult birds. Also, peregrine falcons are known to take laughing gulls and terns during winter.

The refuge should closely monitor whether fish crows are causing a population level effect on birds. If depredation from fish crows is considered to be increasing or already excessive, USDA Wildlife Services should be consulted about methods for dealing with individual crows exhibiting depredation behavior.

Vegetation management. Vegetation management is necessary to maintain and increase nesting areas for terns and skimmers, especially where erosion rates are exceeding accretion rates. Vegetation management may include a limited amount of removing native (sea oats and low herbaceous plants) as well as exotic (Brazilian pepper and Australian pine) plants. In particular, fish crows use the Australian pines as perches and removal of these exotic trees may be one measure to reduce depredation problems from fish crows.

Beach renourishment. Beach renourishment is likely necessary to maintain the existing nesting habitat for terns and skimmers on both Egmont and Passage Keys, given present erosion rates ongoing on both refuges. However, there are many considerations involved in promoting continual renourishment proposals. The immediate impacts of beach renourishment include effects to near shore fauna, including a reduction in invertebrates available for foraging shorebirds and effects or changes to the pattern of currents off shore. Renourished beaches require periodic investments to maintain. The consequences of not renourishing the beach include no beach for sea turtles or birds to nest on. In addition to providing habitat for nesting turtles and birds, renourishment also protects the cultural resources on Egmont Key. Beach renourishment should only occur after nesting season for the birds and turtles.

The review team encourages beach renourishment at Egmont Key on regular intervals with a thoughtful process that considers all resource issues and addresses when, where, how, how much, etc. Short-term decisions to renourish the beach at Egmont Key need to be expedited to take advantage of dredge spoil that could become available.

Passage Key may benefit from renourishment activities also or the island can be left to come and go dynamically with natural processes. There are Wilderness Designation concerns, but renourishment can be done (e.g., Pelican Island).

Reduce monofilament. Hundreds of birds are killed and/or maimed by improperly discarded fishing line in Tampa Bay each year, especially vulnerable are brown pelican and magnificent frigatebird. Working with state and local agencies, the refuge needs to educate anglers on the harm associated with inappropriate monofilament disposal.

Non-breeding Shorebirds

In addition to supporting important nesting habitat, the beaches and sand dunes on Egmont and Passage Keys also provide important foraging and roosting habitat for transient and wintering shorebirds (including Federally Threatened piping plover).

Major issues for these species include disturbance and beach renourishment that have been treated above.

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates the following species migrating through or wintering in Tampa Bay should be considered as in need of conservation attention in refuge planning:

Species of Conservation Importance (Concern vs. Stewardship vs. other, Action level, species, Combined Score, and whether State listed).

Conservation Concern Species

Critical Recovery

Piping Plover 24, also FT, SL
Long-billed Curlew 19

Immediate Management

None

Management Attention

Marbled Godwit 19
Semipalmated Sandpiper 19
Short-billed Dowitcher 19
Least Sandpiper 18
Stilt Sandpiper 18
Red Knot 17
Sanderling 17
Western Sandpiper 17
Dunlin 17
Whimbrel 16
Ruddy Turnstone 16

Planning and Responsibility

Willet 16

Conservation Stewardship

Planning and Responsibility

Black-bellied Plover

Semipalmated Plover

Other species

None

*Tampa Bay Refuges have high responsibility for supporting all Tampa Bay populations.

**Tampa Bay Refuges have high responsibility for supporting all Peninsular Florida (BCR 31) populations.

Special mention is needed for red knot, for which status at Egmont and Passage Keys is unclear. Any red knots that do occur may involve both individuals from the Southeast U.S. wintering population (considered presently stable, maybe) and possibly also individuals migrating to and from Tierra Del Fuego (undergoing steep declines). Both populations, but especially the Tierra del Fuego population, are of increasing concern. If repeated beach renourishment results in a collapse of beach invertebrates available, then this may further impact one or both red knot populations if either occur regularly at Egmont Key. Similarly, repeated disturbances of foraging red knot flocks (and other shorebirds) may reduce ability to migrate successfully to the next important stopover site (whether northbound or southbound).

Landbirds

Landbirds of conservation interest on Tampa Bay Refuges include mangrove breeding species (on Pinellas NWR) and transient nearctic-neotropical migratory species (on Pinellas and Egmont Key NWRs).

The conservation list for Bird Conservation Region 31 (BCR 31, Peninsular Florida) indicates the following species breeding, migrating through or wintering in Tampa Bay should be considered as in need of conservation attention in refuge planning: Most of this attention would be tied to monitoring as there is very little active management intended for landbird habitat other than exotic vegetation control where needed.

Species of Conservation Importance (Concern vs. Stewardship vs. other, Action level, species, Combined Score, and whether State listed).

Conservation Concern Species

Critical Recovery

None

Immediate Management

Prairie Warbler (Florida subspecies) 19

Loggerhead Shrike (any on Egmont Key?) 18

Painted Bunting (non-breeding) 17

Management Attention

Mangrove Cuckoo 19
Black-whiskered Vireo 19
Common Ground-Dove 17
Eastern Towhee (CHECK for Egmont) 17
Common Nighthawk 16
Chuck-will's-widow 16
Eastern Meadowlark 16
Northern Flicker 15
Northern Harrier 14
Purple Martin 14
Vesper Sparrow (non-breeding) 14

Planning and Responsibility

None

Conservation Stewardship

Planning and Responsibility

Gray Kingbird
White-eyed Vireo
Sedge Wren
Cape May Warbler (transient)
Black-throated Blue Warbler (transient)
Connecticut Warbler (transient)
Bobolink (transient)

Other species

Peregrine Falcon (N)

Mangroves support a number of landbirds of continental and regional concern, principally restricted within the continental United States to Peninsula Florida. Principal among these species are mangrove cuckoo, black-whiskered vireo, and Florida prairie warbler all of which reach the northern most breeding outposts in Florida within the Tampa-St. Petersburg area (specifically no further north of Anclote Keys, Pasco County). Of these three species in Tampa Bay, the Florida prairie warbler is the most common, mangrove cuckoo is the rarest, and black-whiskered vireo is thought to have declined in recent decades (Paul, regional reports in *American Birds*).

Gray kingbird is another breeding species that is associated with open habitats and appears to be stable in the Tampa Bay area.

Dozens of nearctic-neotropical migratory species regularly pass through Tampa Bay, especially northbound and are priorities either at the national level or within specific physiographic regions. Presumably, availability of extensive and diverse mangrove and hardwood hammock habitats will accommodate the invertebrate, fruit, and nectar demands of most in-transit forest-dwelling species. Many grassland-scrubland species seem to make successful en-route use of disturbed habitats as well.

Efforts are underway to determine status and trends of these transient species in Florida, using point counts as the basic survey technique. Once a protocol is established, data from Tampa Bay Refuges would be desired to better understand roles of refuge lands in contributing to the conservation of these species. Fruiting understory and edge plants are important for these species. Establishing

transects in contribution to regional Migration Surveys (on Egmont Key as best location) would add information on both the status of migrants and their use of refuge habitats. Any management actions implemented in hardwood hammock should give consideration to potential impacts on food and shelter resources available long-term to migrating birds. However, it is likely that any such actions would be beneficial or neutral.

As mentioned above, mosquito control on adjacent lands may effect indirectly insectivore food supplies for both breeding and migrant landbirds (including larvicides). Monitoring the mosquito control activities with respect to drift should be considered for landbird in Tampa Bay Refuges.

Florida prairie warbler, gray kingbird (local interest species), black-whiskered vireo, and mangrove cuckoo were being monitored on mangrove islands by the late Rich Paul. Tampa Bay represents the northernmost established outpost for these species along the Gulf Coast of Florida and detections should be recorded during other activities. Refuge staff should seek the possibility of continuing Rich Paul's important work with these and other Tampa Bay bird species.

Refuges and other collaborators in south Florida are establishing monitoring protocols to determine status and trends for Florida's mangrove associated landbird species using the following baseline data to measure status (the densities given below are for mangrove birds and based on accounts in the Rare Biota of Florida series). Without knowing what is presently in Tampa Bay, if and when we establish a survey system (point counts or otherwise), we should compare with the densities listed for Florida Prairie Warbler, Black-whiskered Vireo, and Mangrove Cuckoo. These densities are likely based on South Florida counts and it is likely Tampa Bay densities for at least mangrove cuckoo and black-whiskered vireo should be much lower:

Mangrove Cuckoo with 1 pair per 25 acres of habitat

Black-whiskered Vireo with one singing male per 2.5 acres of habitat

Florida Prairie Warbler with one singing male per 2.5 acres of habitat

FISHES

Common Name	Scientific Name
Speckled worm eel	<i>Myrophis punctatus</i>
Spotted moray	<i>Cymnothorax moringa</i>
Spotted seatrout	<i>Cynoscion nebulosus</i>
Tarpon	<i>Megalops atlanticus</i>
Common snook	<i>Centropomus undecimalis</i>
Mosquitofish	<i>Gambusia sp.</i>
Striped mullet	<i>Mugil cephalus</i>
Redfish	<i>Scianops ocellatus</i>
Barracuda	<i>Sphyrna barracuda</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Atlantic spadefish	<i>Chaetodipterus faber</i>
Blacktip shark	<i>Carcharhinus limbatus</i>
Bonnethead shark	<i>Sphyrna tiburo</i>
Burrfish	<i>Chilomycterus sp.</i>
Pigmy File Fish	<i>Monacanthus setifer</i>
Florida pompano	<i>TGrachinotus carolinus</i>
Gafftopsail catfish	<i>Bagre marinus</i>
Nassau grouper	<i>Epinephelus striatus</i>
Nurse shark	<i>Ginglymostoma cirratum</i>
Pinfish	<i>Lagodon rhomboids</i>
Scrawled cowfish	<i>Lactophrys quadricornis</i>
Sharksucker	<i>Echeneis naucrates</i>

REPTILES

Common Name	Scientific Name
Florida box turtle	<i>Terrapene carolina bauri</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Atlantic loggerhead	<i>Caretta caretta caretta</i>
Atlantic green turtle	<i>Chelonia mydas mydas</i>
Green anole	<i>Anolis carolinensis carolinensis</i>
Brown anole*	<i>Anolis sagrei</i>
Six-lined racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>
Mole skink	<i>Eumeces egregious</i>
Southern black racer	<i>Coluber constrictor priapus</i>
Corn snake	<i>Elaphe guttata guttata</i>
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>
Florida kingsnake	<i>Lampropeltis getula floridana</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>

AMPHIBIANS

Common Name	Scientific Name
Eastern narrowmouth toad	<i>Gastrophryne carolinensis</i>
Squirrel treefrog	<i>Hyla squirella</i>

MAMMALS

Common Name	Scientific Name
Common pilot whale	<i>Globicephala melaena</i>
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>
Bottle-nosed dolphin	<i>Tursiops truncatus</i>
Risso's dolphin	<i>Grampus griseus</i>
West Indian manatee	<i>Trichechus manatus latirostris</i>
Feral cat*	<i>Felis domesticus</i>

PLANTS

Common Name	Scientific Name
PTERIDOPHYTES	
Toothed mid-sorus fern	<i>Blechnum serrulatum</i>
Golden polypody	<i>Phlebodium aureum</i>
Whisk fern	<i>Pteris vittata</i>
GYMNOSPERMS	
Southern red cedar	<i>Juniperus silicicola</i>
ANGIOSPERMS	
MONOCOTS	
False sisal	<i>Agave decipens</i>
Wild century plant	<i>Agave neglecta</i>
Sisal hemp*	<i>Agave sisalana</i>
Bushy bluestem	<i>Andropogon glomeratus</i>
Tall threeawn grass	<i>Aristida patula</i>
Southern sandspur	<i>Cenchrus echinatus</i>
Coast sandspur	<i>Cenchrus incertus</i>
Dune sandspur	<i>Cenchrus tribuloides</i>
Milk-and-wine lily	<i>Crinum americanum</i>
String-lily	<i>Crinum americanum</i>
Bermuda grass*	<i>Cynodon dactylon</i>
Alabama swamp flat sedge	<i>Cyperus ligularis</i>
Flatleaf flat sedge	<i>Cyperus planifolius</i>
Texas sedge	<i>Cyperus polystachyos</i>

PLANTS

Common Name	Scientific Name
Straw-color flat sedge	<i>Cyperus strigosus</i>
Crowfoot grass*	<i>Dactyloctenium aegyptium</i>
Seashore saltgrass	<i>Distichlis spicata</i>
Roadgrass	<i>Eleocharis baldwinii</i>
Centipede grass*	<i>Eremochloa ophiuroides</i>
Rock finger grass	<i>Eustachys petraea</i>
Marsh fimbry	<i>Fimbristylis spedicea</i>
Shoal grass	<i>Halodule wrightii</i>
Muhly grass	<i>Muhlenbergia capillaries</i>
Beach panicum	<i>Panicum amarum</i>
Guinea grass	<i>Panicum maximum</i>
Thin paspalum	<i>Paspalum setaceum</i>
Seashore pellitory	<i>Paspalum vaginatum</i>
Date palm*	<i>Phoenix dactylifera</i>
White tops	<i>Phynchospora colorata</i>
Red natal grass	<i>Rhynchelytrum repens</i>
Sabal palm	<i>Sabal palmetto</i>
Saw palmetto	<i>Serenoa repens</i>
Knotroot foxtail	<i>Seteria parviflora</i>
Narrow-leaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Wild bamboo	<i>Smilax auriculata</i>
Marshhay cord grass	<i>Spartina patens</i>

PLANTS

Common Name	Scientific Name
Spring ladies' tresses	<i>Sprianthes vernalis</i>
Seashore dropseed	<i>Sporobolus virginicus</i>
St. Augustine grass	<i>Stenotaphrum secundatum</i>
Manatee grass	<i>Syringodium filiforme</i>
Turtle grass	<i>Thalassia testudinum</i>
Ball moss	<i>Tillandsia recurvata</i>
Southern cattail	<i>Typha domingensis</i>
Sea oats	<i>Uniola paniculata</i>
Spanish bayonet*	<i>Yucca aloifolia</i>
DICOTS	
Smooth chaff-flower	<i>Alternanthera polygonoides</i>
Mexican poppy	<i>Argemone Mexicana</i>
Annual marsh aster	<i>Aster subulatus</i>
Sand atriplex	<i>Atriplex pentandra</i>
Groundsel bush	<i>Baccharis halimifolia</i>
Smooth water-hyssop	<i>Bacopa monnieri</i>
Saltwort	<i>Batis maritime</i>
Beggar's tick	<i>Bidens alba</i>
Samphire	<i>Blutaparon vermiculare</i>
Red spiderling	<i>Boerhavia diffusa</i>
Sea daisy	<i>Borrichia frutescens</i>
Blueheart	<i>Buchnera Americana</i>

PLANTS

Common Name	Scientific Name
Saffron plum	<i>Bumelia celastrina</i>
Gray nicker	<i>Caesalpinia bonduc</i>
Southern sea rocket	<i>Cakile lanceolata</i>
Love vine	<i>Cassytha filiformis</i>
Beefwood*	<i>Casuarina cunninghamiana</i>
Australian pine*	<i>Casuarina equisetifolia</i>
Scaly-bark beefwood*	<i>Casuarina glauca</i>
Madagascar periwinkle*	<i>Catharanthus roseus</i>
Partridge pea	<i>Chamaecrista fasciculata</i>
Blodgett's spurge	<i>Chamaesyce blodgettii</i>
Sand-dune spurge	<i>Chamaesyce bombensus</i>
Garden spurge	<i>Chamaesyce hirta</i>
Hyssop spurge	<i>Chamaesyce hyssopifolia</i>
Coast spurge	<i>Chamaesyce mesembryanthemifolia</i>
Lambs quarters	<i>Chenopodium album</i>
Snowberry	<i>Chiococca alba</i>
Horrid thistle	<i>Cirsium horridulum</i>
Tread softly	<i>Snidoscolus stimulosus</i>
Pigeon plum	<i>Coccoloba diversifolia</i>
Sea grape	<i>Coccoloba uvifera</i>
Buttonwood	<i>Conocarpus erecta</i>
Horseweed	<i>Conyza Canadensis</i>

PLANTS

Common Name	Scientific Name
Milk-and-wine lily	<i>Crinum amabile</i>
Small rattlebox	<i>Crotalaria pumila</i>
Rabbit bells	<i>Crotalaria rotundifolia</i>
Love vine	<i>Cuscuta gronovii</i>
Coastal cynanchum	<i>Cynanchum angustifolium</i>
Coin vine	<i>Dalbergia ecastophyllum</i>
Florida beggarweed	<i>Desmodium tortuosum</i>
Varnish leaf	<i>Dodonaea viscosa</i>
False-daisy	<i>Eclipta prostrata</i>
Southern fleabane	<i>Erigeron quercifolius</i>
Daisy fleabane	<i>Erigeron strigosus</i>
Beach creeper	<i>Ernodea littoralis</i>
Spanish stopper	<i>Eugenia foetida</i>
Semaphore eupatorium	<i>Eupatorium mikanioides</i>
Late boneset	<i>Eupatorium serotinum</i>
Seaside gentian	<i>Eustoma exaltata</i>
Golden fig	<i>Ficus aurea</i>
Florida yellow top	<i>Flaveria floridana</i>
Florida privet	<i>Forestiera segregata</i>
Downy milk-pea	<i>Galactia volubilis</i>
One-flowered bedstraw	<i>Galium uniflorum</i>
Southern gaura	<i>Gaura angustifolia</i>

PLANTS

Common Name	Scientific Name
Purple cudweed	<i>Gnaphalium purpureum</i>
Diamond flower	<i>Hedyotis nigricans</i>
Hairy beach sunflower	<i>Helianthus debilis vestitus</i>
Beach sunflower	<i>Helianthus debilis</i>
Scorpion tail	<i>Heliotropium angiospermum</i>
Pineland heliotrope	<i>Heliotropium polyphyllum</i>
Camphorweed	<i>Heterotheca subaxillaris</i>
Marsh pennywort	<i>Hydrocotyle umbellata</i>
Moonflower	<i>Ipomoea alba</i>
Railroad vine	<i>Ipomoea pes-caprae</i>
Bloodleaf	<i>Iresine diffusa</i>
Bigleaf marsh elder	<i>Iva frutescens</i>
Seacoast marsh elder	<i>Iva imbricate</i>
Saltmarsh mallow	<i>Kosteletzkya virginica</i>
White mangrove	<i>Laguncularia racemosa</i>
Poor man's pepper	<i>Lepidium virginicum</i>
Variable false pimpernel	<i>Lindernia anagallidea</i>
Frog fruit	<i>Lippia nodiflora</i>
Christmasberry	<i>Lycium carolinianum</i>
Curtiss' primrose-willow	<i>Ludwigia curtissii</i>
Purple axil-flower	<i>Mecardonia acuminata</i>
Chinaberry*	<i>Melia azedarach</i>

PLANTS

Common Name	Scientific Name
Climbing hempweed	<i>Midania scandens</i>
Wax myrtle	<i>Myrica cerifera</i>
Oleander*	<i>Nerium oleander</i>
Seaside evening primrose	<i>Oenothera humifusa</i>
Prickly-pear cactus	<i>Opuntia humifusa</i>
Shell mound prickly-pear cactus	<i>Opuntia stricta</i>
Florida pellitory	<i>Parietaria floridana</i>
White pellitory	<i>Parietaria praetermissa</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Corky-stemmed passionflower	<i>Passiflora suberosa</i>
Frog fruit	<i>Phyla nodiflora</i>
Abnormal phyllanthus	<i>Phyllanthus abnormis</i>
Seaside ground cherry	<i>Physalis viscosa</i>
Pokeweed	<i>Phytolacca Americana</i>
Paleseed plantain	<i>Plantago virginica</i>
Shrubby camphorweed	<i>Pluchea odorata</i>
Painted-leaf	<i>Poinsettia cyathophora</i>
Large flowered milk wort	<i>Polygala grandiflora</i>
Rustweed	<i>Polypreum procumbens</i>
Portulaca	<i>Portulaca oleracea</i>
Pink purslane	<i>Portulaca pilosa</i>

PLANTS

Common Name	Scientific Name
Hair-like mock bishop's-weed	<i>Ptilimnium capillaceum</i>
Myrsine	<i>Rapanea punctata</i>
Red mangrove	<i>Rhizophora mangle</i>
Least snout bean	<i>Phynchosia minima</i>
Toothcup	<i>Rotala ramosior</i>
Southern dewberry	<i>Rubus trivalis</i>
Water pimpernel	<i>Samolus ebracteatus</i>
Inkberry	<i>Scaevola plumieri</i>
Brazilian pepper*	<i>Schinus terebinthifolius</i>
Slender sea purslane	<i>Sesuvium maritimum</i>
Sea purslane	<i>Sesuvium portulacastrum</i>
Southern sida	<i>Sida acuta</i>
Black nightshade	<i>Solanum chenopodioides</i>
Pine barren goldenrod	<i>Solidago fistulosa</i>
Seaside goldenrod	<i>Solidago sempervirens</i>
Common sow thistle	<i>Sonchus oleraceus</i>
Yellow necklace pod	<i>Sophora tomentosa</i>
Blue porterweed	<i>Stachytarpheta jamaicensis</i>
Bay-cedar	<i>Suriana maritima</i>
New Zealand spinach*	<i>Tetragonia tetragonioides</i>
Poison ivy	<i>Toxicodendron radicans</i>
Forked bluecurl	<i>Trichostema dichotomum</i>

PLANTS

Common Name	Scientific Name
Marsh verbena	<i>Verbena scabra</i>
Yellow vigna	<i>Vigna luteola</i>
Summer grape	<i>Vitus aestivalis</i>
Southern fox grape	<i>Vitus rotundifolia var. munsoniana</i>
Indian waltheria	<i>Waltheria indica</i>
Hercules club	<i>Zanthoxylum clava-herculis</i>

Appendix J. Budget Requests

REFUGE OPERATING NEEDS SYSTEM (RONS)

Will be included in final ccp

Maintenance Management System Needs

Appendix K. List of Preparers

Table 19. Tampa Bay Refuges comprehensive conservation core planning team members

Name and Title	Organization, Location
Jim Kraus , former Refuge Manager John Kasbohm , former Deputy Refuge Manager Sarah Palmisano , former Refuge Operations Specialist Keith Ramos , Deputy Refuge Manager Richard Meyers , Assistant Refuge Manager Joyce Kleen , Wildlife Biologist Ivan Vicente , Park Ranger	U.S. Fish and Wildlife Service – Chassahowitzka NWR Complex
Mary Morris , Planner	U.S. Fish and Wildlife Service – Regional Office, Tallahassee, Florida
Anne Aiken , Contracted Planner	U.S. Tennessee Valley Authority, Chattanooga, Tennessee

Table 20. Tampa Bay Refuges comprehensive conservation public use review team members (March 23-25, 2004)

Name and Title	Organization, Location
Jim Kraus , former Refuge Manager Shawn Gillette , former Park Ranger	U.S. Fish and Wildlife Service – Chassahowitzka NWR Complex
Garry Tucker , Visitor Services and Outreach Deborah Jerome , Visitor Services and Outreach	U.S. Fish and Wildlife Service – Regional Office - Atlanta
Dorn Whitmore , Public Use Specialist	U.S. Fish and Wildlife Service – Merritt Island NWR

Table 21. Tampa Bay Refuges comprehensive conservation cultural resources review team members (August 31 to September 1, 2004)

Name and Title	Organization, Location
Jim Kraus , former Refuge Manager John Kasbohm , former Deputy Refuge Manager Sarah Palmisano , former Refuge Operations Specialist	U.S. Fish and Wildlife Service – Chassahowitzka NWR Complex
Rick Kanaski , Regional Archaeologist	U.S. Fish and Wildlife Service – Regional Office, Atlanta, Georgia
Mary Morris , Planner	U.S. Fish and Wildlife Service – Regional Office, Tallahassee, Florida
Scott Robinson , Park Manager	Florida Park Service – Honeymoon Island, Dunedin, Florida
Tom Watson , Assistant Park Manager	Florida Park Service – Egmont Key, St. Petersburg, Florida
Brian Burket , Office of Park Planning	Florida Park Service
Richard Johnson , President Barbara Schmidt , Member and volunteer	Egmont Key Alliance, St. Petersburg, Florida
Laura Kammerer , Deputy SHPO	Florida Division of Historical Resources
Steve Martin , Historical Resource Administrator	Florida Division of Environmental Protection
Brent Weisman , Department of Anthropology	University of South Florida
Jonathan Dean , Ph.D. Candidate	University of South Florida
Margo Schwadron , Archaeologist	National Park Service, Southeast Archaeological Center

Table 22. Tampa Bay Refuges comprehensive conservation biological review team members (May 11-13, 2004)

Name and Title	Organization, Location
Jim Kraus , former Refuge Manager John Kasbohm , former Deputy Refuge Manager Sarah Palmisano , former Refuge Operations Specialist Joyce Kleen , Wildlife Biologist	U.S. Fish and Wildlife Service – Chassahowitzka NWR Complex
Dean Demarest , Acting Nongame Bird Program Coordinator Chuck Hunter , Regional Refuge Biologist	U.S. Fish and Wildlife Service – Regional Office, Atlanta, Georgia
Nancy Douglass , Regional Nongame Wildlife Biologist	Florida Fish and Wildlife Conservation Commission, Lakeland, Florida
Rich Paul , retired (now deceased), Research Biologist and Sanctuary Manager	Florida Coastal Sanctuaries, National Audubon, Tampa, Florida
Sally Braem , Biologist	Florida Park Service – Honeymoon Island State Park, Dunedin, Florida
Mary Morris , Planner	U.S. Fish and Wildlife Service, Regional Office, Tallahassee, Florida
Consulted, but not able to attend the biological review:	
Ken Dodd , Herpetology Expert	U.S. Geological Survey, Gainesville, Florida
Peter Stangel , Director, Southeast Region	National Fish and Wildlife Foundation, Atlanta, Georgia
Sandy MacPherson , Sea Turtle Coordinator	U.S. Fish and Wildlife Service, Regional Office, Jacksonville, Florida

Table 23. Tampa Bay Refuges comprehensive conservation wilderness review team members (January 11-12, 2005)

Name and Title	Organization, Location
Jim Kraus , former Refuge Manager John Kasbohm , former Deputy Refuge Manager Sarah Palmisano , former Refuge Operations Specialist Joyce Kleen , Wildlife Biologist	U.S. Fish and Wildlife Service – Chassahowitzka NWR Complex
Deborah Jerome , Visitor Services and Outreach	U.S. Fish and Wildlife Service – Regional Office, Atlanta, Georgia (via conference call)
Mary Morris , Planner	U.S. Fish and Wildlife Service – Regional Office, Tallahassee, Florida

Appendix L. Sea Level Affecting Marshes Model Analysis

This appendix contains the following documents:

“Rising Tides: A Summary of Projected Impacts of Sea Level Rise on Florida’s Coasts and Ding Darling, Egmont Key, Pine Island and Pelican Island National Wildlife Refuges,” prepared by Sean McMahon (Virginia Tech Independent Study Project) on October 25, 2006, for Dr. Brian Czech, U.S. Fish and Wildlife Service.

“Application of the Sea-Level Affecting Marshes Model (SLAMM 5.0) to Pinellas National Wildlife Refuge,” prepared July 10, 2008, by Jonathan S. Clough of Warren Pinnacle Consulting, Inc., Warren, Vermont, for Dr. Brian Czech, U. S. Fish and Wildlife Service.
