
**DRAFT COMPREHENSIVE CONSERVATION PLAN
AND ENVIRONMENTAL ASSESSMENT**

ST. VINCENT NATIONAL WILDLIFE REFUGE
Franklin and Gulf Counties, Florida

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

Southeast Region
Atlanta, Georgia

April 2012

TABLE OF CONTENTS

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. BACKGROUND.....	1
Introduction.....	1
Purpose And Need For The Plan	1
U.S. Fish and Wildlife Service	1
National Wildlife Refuge System	2
Legal and Policy Context.....	4
National and International Conservation Plans and Initiatives	5
Relationship To State Wildlife Agency.....	6
II. REFUGE OVERVIEW.....	9
Introduction.....	9
Refuge History and Purpose	9
Special Designations	17
Coastal Barrier Resources System	17
Marine Protected Area	18
National Estuary Program	18
State Aquatic Preserves.....	19
Outstanding Florida Waters	19
Surface Water Classification	21
National Geographic Framework.....	21
Regional Conservation Plans and Initiatives	21
State Wildlife Action Plan	21
Endangered Species Act Recovery Plans	22
Florida Bird Conservation Initiative	22
Florida Natural Inventory	22
Gulf of Mexico Program	22
Ecological Threats and Problems.....	24
Proliferation of Invasive plant and animals.....	24
Altered Fire Regime	24
Altered hydrology	24
Climate Change and Sea Level Rise	25
Physical Resources	26
Climate	26
Geology and Topography.....	26
Soils	30
Hydrology	35
Air Quality.....	36
Water Quality and quantity.....	36
Biological Resources	37
Habitat.....	37
Cultural Resources	45
Socioeconomic Environment	47
Refuge Administration and Management	50
Land Protection and Conservation.....	50
Visitor Services	50
Personnel, Operations, and Maintenance.....	51

III. PLAN DEVELOPMENT.....	55
Summary of Issues, Concerns, and Opportunities.....	55
Priority Resource Issues	55
Fish and Wildlife Population Management.....	55
Habitat Management.....	56
Resource Protection	56
Visitor Services	57
Refuge Administration	58
IV. MANAGEMENT DIRECTION	59
Introduction	59
Vision	59
Goals, Objectives, and Strategies	60
Fish and Wildlife Population Management.....	60
Habitat Management.....	68
Resource Protection	74
Visitor Services	78
Refuge Administration	84
V. PLAN IMPLEMENTATION	87
Introduction	87
Proposed Projects.....	87
Funding and Personnel	90
Partnership/Volunteer Opportunities	93
Step-Down Management Plans.....	93
Monitoring and Adaptive Management.....	93
Plan Review and Revision.....	94
SECTION B. ENVIRONMENTAL ASSESSMENT	
I. BACKGROUND	95
Introduction	95
Purpose and Need for Action	95
Decision Framework.....	96
Planning Study Area	96
Authority, Legal Compliance, and Compatibility.....	96
Compatibility	96
Public Involvement and the Planning Process	97
II. AFFECTED ENVIRONMENT	99

III. DESCRIPTION OF ALTERNATIVES	101
Formulation of Alternatives.....	101
Description of Alternatives.....	101
Alternative A (Current Management - No Action).....	101
Alternative B.....	102
Alternative C (Proposed Alternative).....	102
Features Common to all Alternatives	103
Comparison of the Alternatives by Issue	105
Alternatives Considered But Eliminated From Further Analysis.....	136
IV. ENVIRONMENTAL CONSEQUENCES	137
Overview.....	137
Effects Common to All Alternatives	137
Health and Safety.....	137
Environmental Justice	137
Climate Change	138
Other Management	138
Land Acquisition.....	138
Cultural Resources.....	139
Refuge Revenue-Sharing.....	139
Other Effects	139
Summary of Effects by Alternative	139
Alternative A (Current Management - No Action).....	139
Alternative B (Emphasize natural and primitive processes).....	140
Alternative C (Expand resource management for native and imperiled species – proposed alternative).....	142
Unavoidable Impacts and Mitigation Measures.....	160
Water Quality from Soil Disturbance and Use of Herbicides.....	160
Wildlife Disturbance	160
Vegetation Disturbance.....	160
User Group Conflicts.....	161
Effects on Adjacent Landowners.....	161
Land Ownership and Site Development.....	161
Cumulative Impacts	161
Effects on the physical environment	162
Effects on the biological environment	162
Effects on the socio-economic environment	163
Direct and Indirect Effects or Impacts.....	164
Short-term Uses versus Long-term Productivity.....	164
V. CONSULTATION AND COORDINATION	165
Overview.....	165
CCP Planning Team (All U.S. Fish and Wildlife Service).....	165
Wildlife and Habitat Management Review Team	165
Visitor Services Review Team (All FWS)	166
Cultural Resources Review Team.....	166
Wilderness Review Team	166
Intergovernmental Coordination Planning Team.....	166

APPENDICES

APPENDIX A. GLOSSARY..... 167

APPENDIX B. REFERENCES AND LITERATURE CITATIONS 179

APPENDIX C. RELEVANT LEGAL MANDATES AND EXECUTIVE ORDERS 187

APPENDIX D. PUBLIC INVOLVEMENT203
 Summary Of Public Scoping Comments203

APPENDIX E. APPROPRIATE USE DETERMINATIONS 209

APPENDIX F. COMPATIBILITY DETERMINATIONS..... 219

APPENDIX G. INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION..... 233

APPENDIX H. WILDERNESS REVIEW..... 241

APPENDIX I. REFUGE BIOTA 243

APPENDIX J. BUDGET REQUESTS 289

APPENDIX K. LIST OF PREPARERS..... 291

LIST OF FIGURES

Figure 1. Refuge Location.....	10
Figure 2. St. Vincent NWR approved acquisition boundary.....	11
Figure 3. Farm Service Agency easements.....	12
Figure 4. St. Vincent Island.....	13
Figure 5. Pig Island.....	14
Figure 6. Mainland Tract (14 Mile Tract).....	15
Figure 7. Florida Aquatic Preserves.....	20
Figure 8. Geographic Framework.....	23
Figure 9. Dune Ridge Sets on St. Vincent Island (Source: Stapor 1973).....	29
Figure 10. Soil Types for St. Vincent NWR.....	31
Figure 11. Vegetation on St. Vincent NWR (Grace 2000).....	40
Figure 12. Facilities map.....	52
Figure 13. Proposed organizational chart.....	91

LIST OF TABLES

Table 1.	Title chain for St. Vincent NWR	17
Table 2.	Geologic Time Chart- Cenozoic Era	27
Table 3.	List of soils on St. Vincent NWR	32
Table 4.	A Cross Comparison of Vegetation Classes and Natural Plant Communities	38
Table 5.	Socioeconomic profile.....	47
Table 6.	Population trends from 1970-2030	48
Table 7.	Employment by industry	49
Table 9.	Step-down management plans	93
Table 10.	Comparison of alternative by management issues for St. Vincent NWR.....	105
Table 11.	Summary of environmental effects by alternative for St. Vincent NWR.....	144

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. Background

INTRODUCTION

This Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for St. Vincent National Wildlife Refuge (NWR) was prepared to guide future management actions and direction for the refuge. It is important to note throughout this document that as an overriding principle, 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 refuge or the purposes for which it was 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 proposed plan, as well as other alternatives considered and their effects on the environment. This 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 this Draft CCP/EA is to develop a proposed action that best achieves the refuge purpose; attains the vision and goals developed for the refuge; contributes to the 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 Fish and Wildlife Service (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.

U.S. 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. In 1886, a Division of Economic Ornithology and Mammalogy was established 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 in the next decade. The name was changed to the Division of 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 550 national wildlife refuges covering over 150 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, 65 fishery resource offices, and 81 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 (Improvement Act) 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 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.

National wildlife refuges connect visitors to their natural resource heritage and provide them with an understanding and appreciation of fish and wildlife ecology to help them understand their role in the environment. Wildlife-dependent recreation on refuges also generates economic benefits to local communities. According to the report, *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation*, approximately 34.8 million people visited national wildlife refuges in Fiscal Year 2006, generating almost \$1.7 billion in total economic activity and creating almost 27,000 private sector jobs producing about \$542.8 million in employment income (Carver and Caudill 2007). As the number of visitors grows, local communities realize important economic benefits. In 2006, 87 million people, 16 years and older, fished, hunted, or observed wildlife, generating \$120 billion (U.S. DOI 2006).

In a study completed in 2002, on 15 refuges, visitation had grown 36 percent in 7 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 Atascosa (Texas); Horicon (Wisconsin); Las Vegas (New Mexico); Tule Lake (California); and Tensas River (Louisiana)--the same refuges identified for the 1995 study. Other findings also validate the findings 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.

Volunteers and friends groups continue to be a major contributor to the success of the Refuge System. In 2006, volunteers contributed more than 1.4 million hours on refuges nationwide, a service valued at more than \$26 million and representing 696 equivalent full-time employees (U.S. Fish and Wildlife Service 2007). And, in 2006, ten new friends groups were formed to support refuge management programs and operations, bringing the Refuge System's total to over 200 (U.S. Fish and Wildlife Service 2007).

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 St. Vincent NWR 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 St. Vincent NWR and other partners, such as, the Florida Fish and Wildlife Conservation Commission, and private landowners, etc.

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, the 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 South Atlantic Coastal Plain 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.

Northern 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 to standardize 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.

For St. Vincent NWR, the primary state agency partners include the Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Environmental Protection (FDEP), Florida Forest Service (FFS), and Northwest Florida Water Management District (NFWFMD). These state agencies are charged with enforcement responsibilities relating to migratory birds, trust species, fisheries, and wetlands, as well as with management of natural resources of the state.

FWC's mission is to manage fish and wildlife resources for their long-term well-being and the benefit of people. FWC is the lead manager on 1.4 million acres and coordinates management on another 4.4 million acres, creating one of the nation's largest systems of state-managed wildlife lands (Florida Fish and Wildlife Conservation Commission 2009a). The FWC protects and manages more than 575 species of wildlife, more than 200 native species of freshwater fish, and more than 500 native species of saltwater fish, while balancing these species' needs with the needs of more than 18 million residents and the millions of visitors who share the land and water with Florida's wildlife (http://www.myfwc.com/ABOUT/About_FastFacts.htm).

The FWC responsibilities include the listed items.

- Law Enforcement – to protect fish and wildlife, keep waterways safe for millions of boaters, and cooperate with other law enforcement agencies providing homeland security.
- Research – to provide information for the FWC and others to make management decisions based on the best science available involving fish and wildlife populations, habitat issues and the human-dimension aspects of conservation.

-
- Management – to manage the state’s fish and wildlife resources based on the latest scientific data to conserve some of the most complex and delicate ecosystems in the world along with a wide diversity of species.
 - Outreach – to communicate with a variety of audiences to encourage participation, responsible citizenship, and stewardship of the state’s natural resources.

FDEP manages 160 state parks covering 700,000 acres including 100 miles of beach and 5 million acres of submerged lands and coastal upland areas, consisting of three national estuarine research reserves, 41 aquatic preserves, and the Florida Keys National Marine Sanctuary.

FFS’s mission is to protect Florida and its people from dangers of wildland fire and to manage the forest resources. Florida is divided into 15 units. St. Vincent NWR is located in the Tallahassee and Chipola Units. Within the Tallahassee Unit there are three state forests; in the Chipola Unit there are two state forests.

The NFWMD is one of five water management districts in Florida, which was created by the Water Resources Act of 1972. The district covers a 16-county region encompassing an 11,305-square-mile area.

The state’s participation and contribution in this planning process has provided and will continue to provide 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

St. Vincent NWR is located in Franklin and Gulf Counties along the Gulf Coast of northwest Florida approximately 60 miles from Panama City and 80 miles from Tallahassee (Figure 1). The approved acquisition boundary for the refuge is approximately 13,736 acres (Figure 2). The refuge owns, in fee-title, approximately 12,490 acres, which make up the refuge's management boundary. The refuge staff also oversees 21 Farm Service Agency (FSA) easements (1,625 acres) in six counties (Figure 3). In 2005, the refuge merged with St. Marks NWR to create the North Florida National Wildlife Refuge Complex. The St. Vincent NWR office/visitor contact station is located in Apalachicola.

The 12,490-acre refuge management boundary includes two islands: St. Vincent Island (12,358 acres), Pig Island (46 acres), and a mainland tract (86 acres). The majority of refuge management activities occurs on St. Vincent Island (Figure 4) located in Apalachicola Bay, in Franklin County, and is only accessible by boat. St. Vincent Island consists of 21 different habitat types ranging from upland slash pine, sand pine, scrub, hardwood hammocks, cabbage palm flatwoods, beach dunes, grasslands, marsh, and open water. There are few developed areas on St. Vincent Island. Pig Island (Figure 5) is a small (46-acre), undeveloped, low-lying coastal island located in Gulf County, Florida. It is situated behind St. Joseph Peninsula, a Gulf-facing spit. A small embayment called Pig Island Bayou separates Pig Island from this peninsula on the south side and adjoins the surrounding St. Joseph Bay, a prolific estuary. The undeveloped island is part of the coastal lowland containing sparse coniferous forest, freshwater marsh, flat sand terrain, bars, and pits. The island and peninsula are part of a dynamic coastal system formed from the deltaic Apalachicola River system. The mainland tract known as the 14 Mile site (Figure 6) is located south of County Road 30A in Franklin County. It has a small developed area where a radio tower and three volunteer campsites are located. The habitat types on the 14 Mile site range from pine upland and oak hammocks, to estuarine marsh. Some refuge management activities occur on the 14 Mile site.

REFUGE HISTORY AND PURPOSE

The lands and water that comprise St. Vincent NWR have a rich history (Table 1). Humans have used the area's natural resources in various ways for thousands of years in order to survive. Early Native Americans lived off the land and waters prior to the arrival of European colonists who settled in the area.

It is believed that Apalachicola River Indians first came in contact with Europeans during Narvaez expedition of 1528. During the Spanish mission to the area around 1633, Franciscan Friars named St. Vincent Island. Around the early 1700s James Moore, British Governor in Charleston, transported thousands of Indians from Apalachee and Apalachicola River countries to a town on the Savannah River (Chapel, unknown). However, around the mid-1700s, the Creek Indians moved into the area. Also the Seminoles, seceders from the Creeks, occupied the area. Up until the Port of Apalachicola was established in 1822, land around the Apalachicola area was occupied by Native Americans. As the Native Americans were forced from the area, they left behind shell middens (mounds) that served as religious and burial sites throughout the area, including the refuge.

Figure 1. Refuge Location

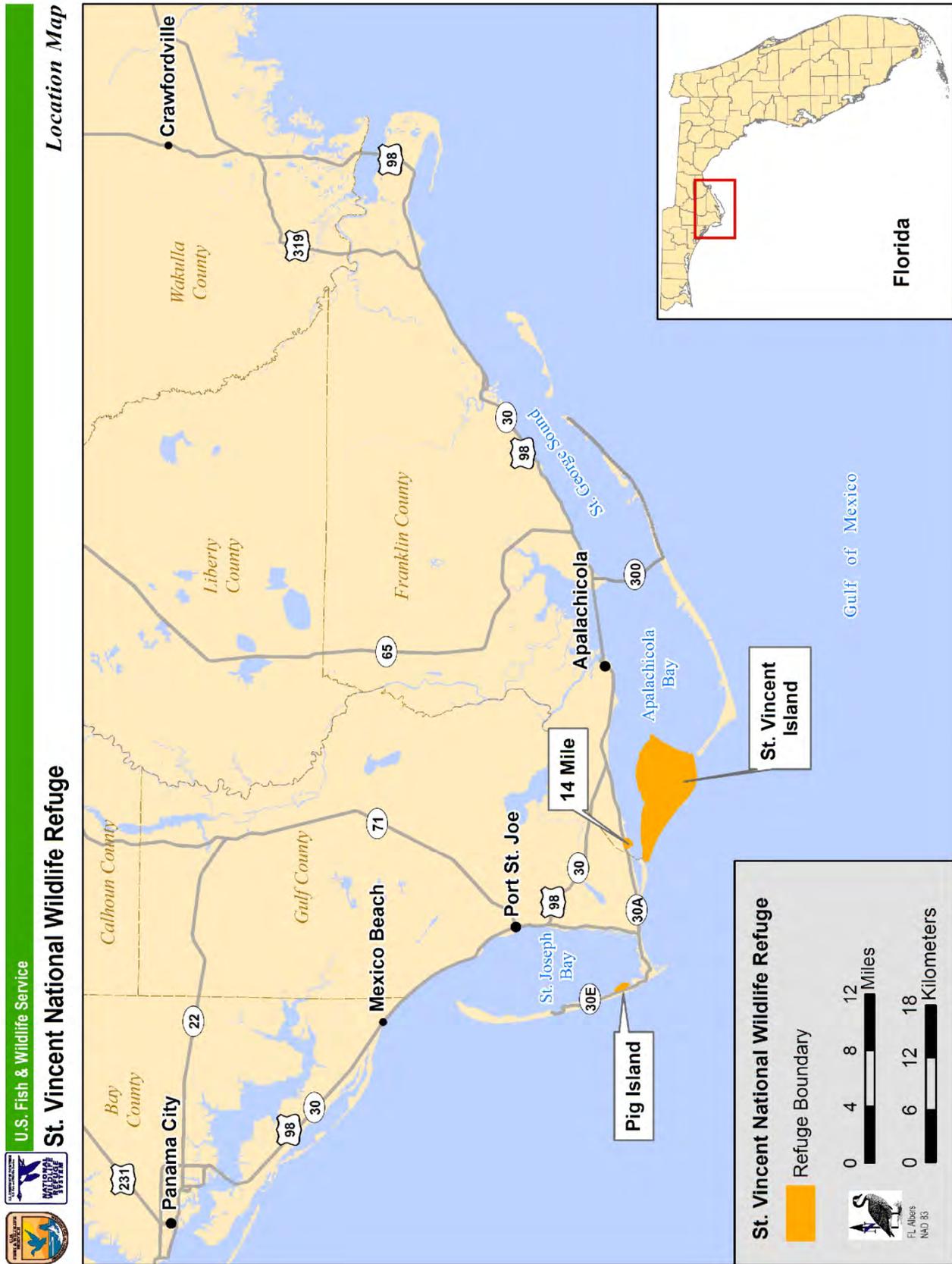


Figure 2. St. Vincent NWR approved acquisition boundary

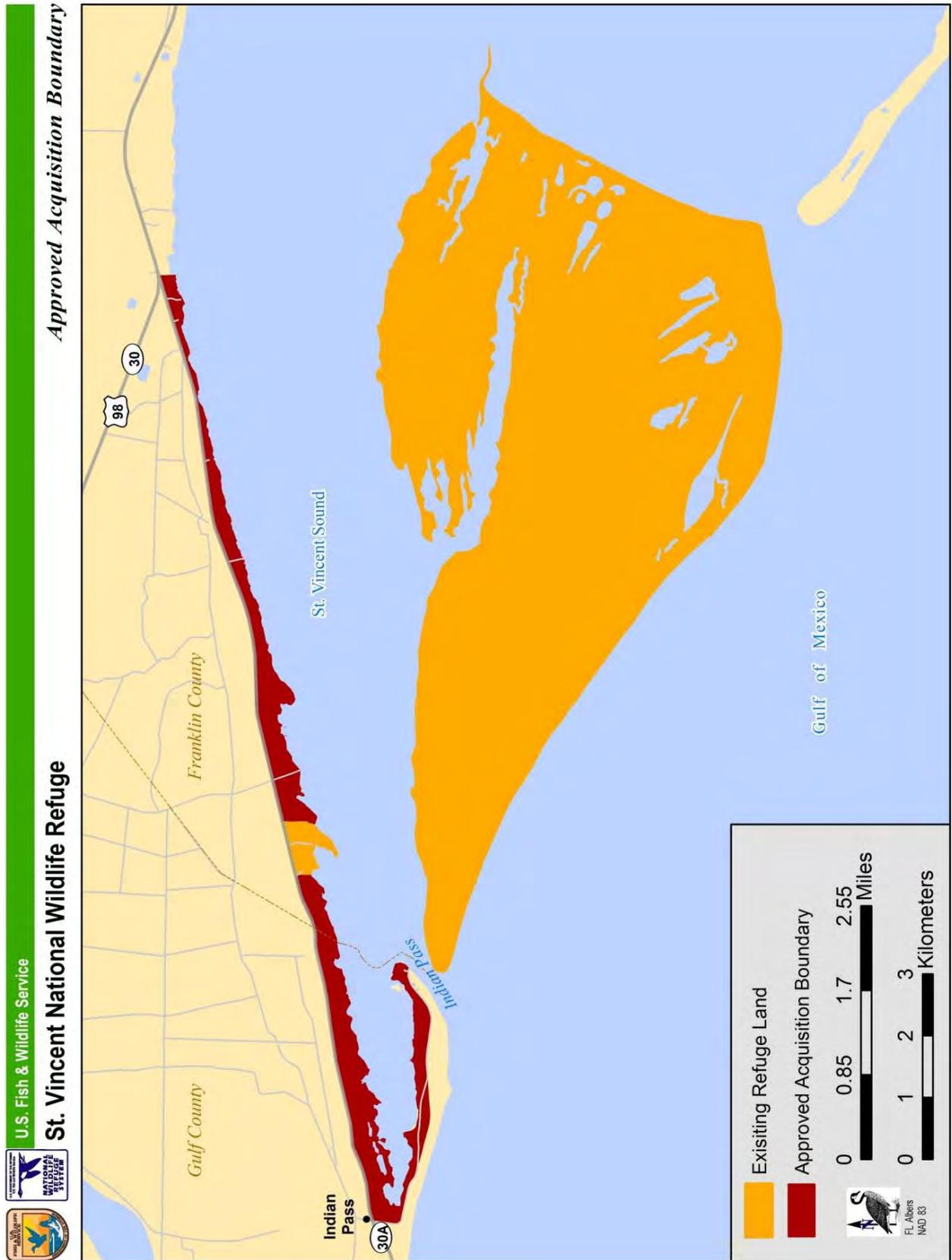


Figure 3. Farm Service Agency easements

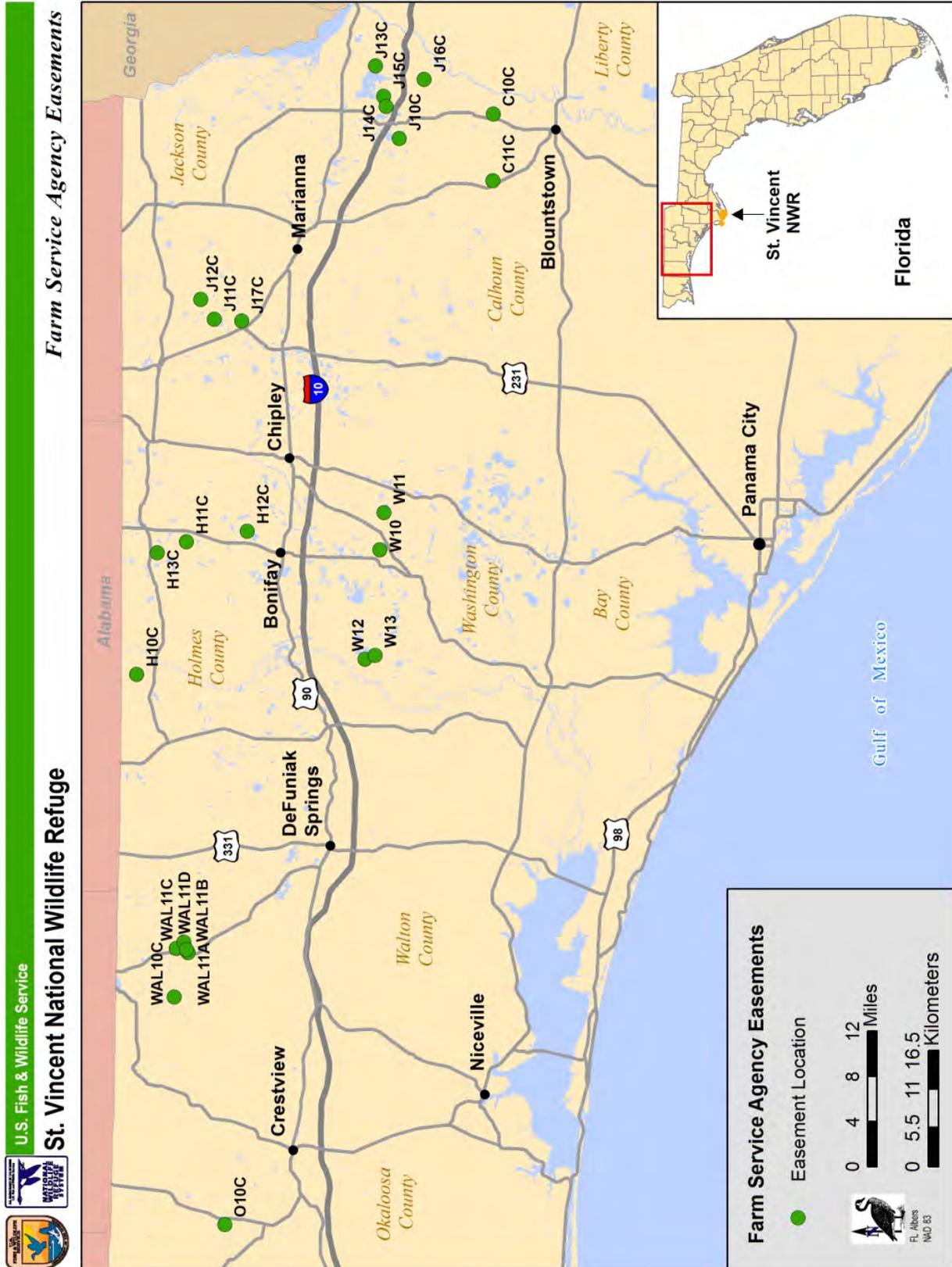


Figure 4. St. Vincent Island

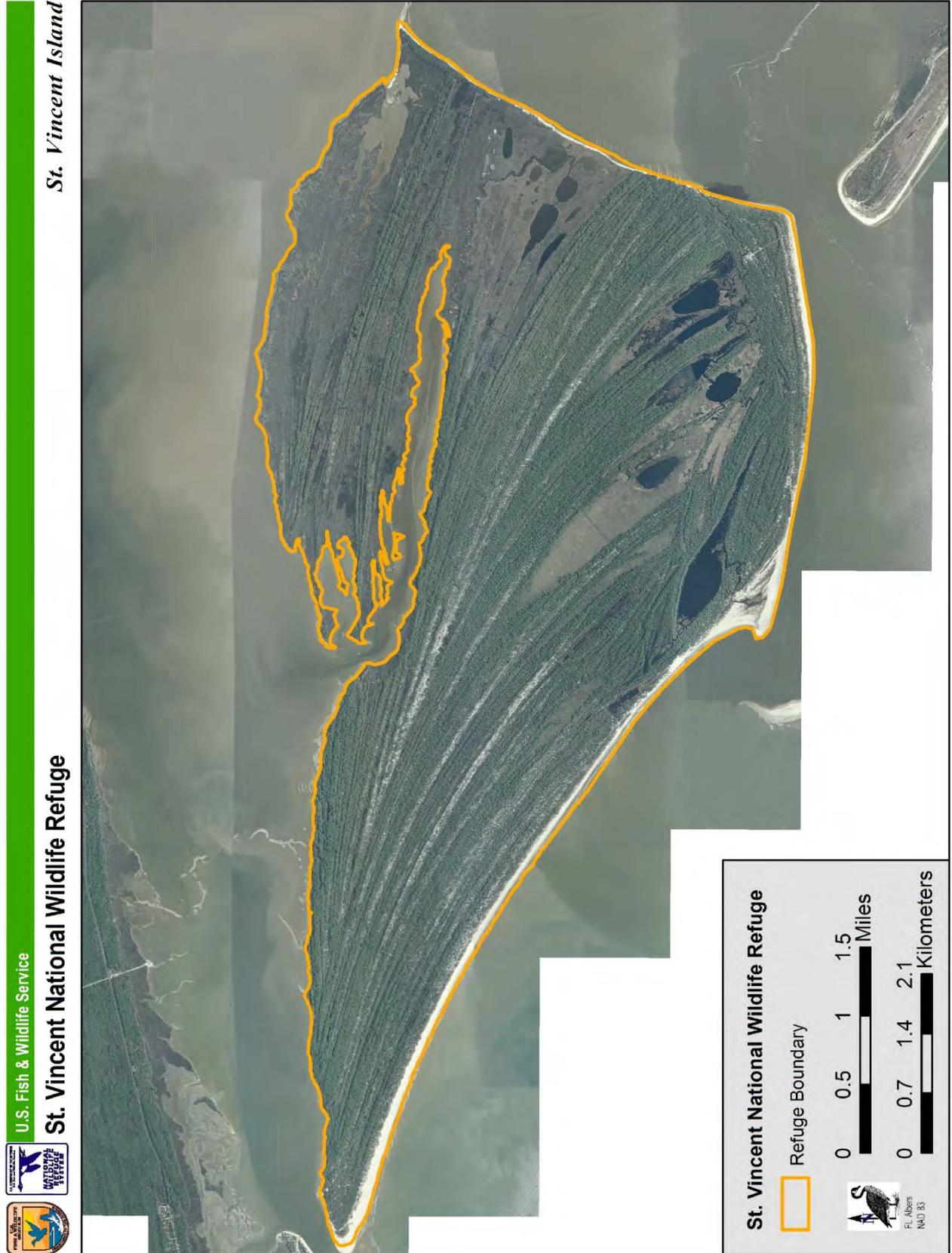


Figure 5. Pig Island



U.S. Fish & Wildlife Service

St. Vincent National Wildlife Refuge

Pig Island



Figure 6. Mainland Tract (14 Mile Tract)



William Panton, John Leslie, and Thomas Forbes owned Panton, Leslie, and Company, a large and prosperous merchant business that would later become known as John Forbes and Company. They received 1,200,000 acres (between Apalachicola and St. Marks River including St. Vincent Island) from the Creek Indians in 1804, known as the Forbes Purchase. When the U.S. Government acquired Florida in 1819, the land purchases were in question. In 1835, the U.S. courts made the final decision on the land and by that time it was owned by Colin Mitchel of the Apalachicola Land Company.

In 1858, Col. Robert J. Floyd, an Apalachicola lawyer, appeared to be the first individual owner of St. Vincent Island. His son, Gabriel Floyd, married Sarah Gorrie, daughter of Dr. John Gorrie. During the Civil War an earthen fort known as Fort Mallory existed on St. Vincent Island. After his death, St. Vincent Island was sold at public auction to Col. "Captain" George Hatch for \$3,000 (in 1868). Captain Hatch was a banker and democratic mayor of Cincinnati, Ohio. Hatch died on the island in 1875. Hatch's wife then sold 10 acres of the island to the U.S. Government for a lighthouse site. The rest of the property was sold to Brigadier General Edward P. Alexander (a commander of artillery in the Army of Northern Virginia during the Civil War and president of the Georgia Central Railroad) and his South Island Company on June 12, 1890.

Dr. Raymond V. Pierce purchased the island from Alexander in 1907 for \$12,500. Pierce from Buffalo, New York, was a successful doctor and medicine man. From 1908 to 1909, R.V. Pierce spent close to \$50,000 developing the island. He built 30 miles of roads/pathways, cottages, barns, dams, and sluice gates for duck ponds and waterways. He imported sambar deer (e.g., large dark brown, 400- to 600-pound deer native to southern Asia). St. Vincent Island was known as a productive cattle ranch with the herd reaching over 400 head. Dr. R.V. Pierce died in 1914. His son, Dr. V.M. Pierce, managed the Pierce Estate. The island was sold in 1925 to Vernon Price-Williams, a Miami land-boom speculator. He then sold the property in 1927 to Big Four Investment Company; however, the Pierce Estate had not received payment for the land. After a long controversy over ownership and title, the island was sold in December 1932 at public auction at Franklin County Courthouse back to the Pierce Estate. During the 1940s, the first timber was logged off the island via a bridge. The bridge known as the Kenny Mill Bridge linked the island to the mainland (at the refuge's 14 Mile site).

In 1948, Alfred Lee and Henry Loomis purchased St. Vincent Island for \$140,000. The well-known natives of Tuxedo Park, New York, continued with the game preserve, introducing zebras, elands, black bucks, and a variety of exotic birds including peacocks. During the 1960s, St. Vincent Island was logged again. The timber was removed by barge.

In 1968, The Nature Conservancy (TNC) purchased St. Vincent Island for \$2.2 million. The exotic animals were removed from the island except for the sambar deer, feral hogs, a few head of cattle, and a couple of black bucks. Funds from the Migratory Bird Conservation Fund (Duck Stamp dollars) purchased St. Vincent Island on July 9, 1968. Due to the island's unusual features, the Department of the Interior assured the Smithsonian Institution that the island would be available for scientific study after its inclusion in the Refuge System.

In 1970, the 86-acre mainland tract (14 Mile site) was acquired from St. Joe Timber Company. The tract was part of a land swap with St. Marks NWR. The intention of the land swap was to create a deep water access point for operations to St. Vincent Island. However, regulations were established to protect Apalachicola Bay which disallowed the development of the deep water access point. The refuge headquarters was located on the property until November 21, 1985, when Hurricane Kate destroyed the office trailer and other associated buildings.

Pig Island, 46 acres in size, is located in St. Joseph Bay, Gulf County. It was transferred from the Bureau of Land Management by Public Land Order 5233 dated July 21, 1972.

The purpose of St. Vincent NWR is to protect and conserve migratory birds in accordance with the following:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."
16 U.S.C. 715D (Migratory Bird Conservation Act of 1929)

Current management is guided by the mission statement directive: "...to manage and preserve the natural barrier island and associated native plant and animal communities."

Table 1. Title chain for St. Vincent NWR

- John Forbes and Company - 1804-From Indians
- Apalachicola Land Company [Colin and Robert Mitchel, Richard Carnohan, James Innerarity, et al.] - 1828-1835
- Robert Floyd - 1835-1868
- George Hatch [Banker and former Mayor of Cincinnati, Ohio] - 1868-1875 (date of death)
- Francis Avery - 1875-1881 [ownership via Hatch's will and as debt payment, minus the dowry right of Elizabeth Josephine Wefing Hatch]
- Elizabeth Josephine Wefing Hatch - 1875-1890
- Edward P. Alexander [Brigadier General and Commander of Artillery, Army of Northern Virginia] - 1890-1907
- Pierce Development Company [Dr. Ray Vaughn Pierce (Pierce's Proprieties, Inc., and founder of Invalids' Hotel Surgical Institute. The Institute ran from 1882-1941. It replaced the earlier Pierce's Palace Hotel, which burned in 1881. Despite its name, the hotel was a private hospital and clinic. Attached to the rear of the Institute was the six-story "World's Dispensary," where a number of patent medicines, such as Dr. Pierce's Golden Medical Discovery, Dr. Pierce's Purgative Pellets, etc., were manufactured. These and a number of other medicinal products were available by mail order and in drug stores -1907-1914)]; V. Mott Pierce, M.D. - 1907-1925, 1930-1948; and Franklin D. Pierce - 1907-1925
- Vernon-Price Williams (Land Speculator, Miami, Florida) - 1925-1927
- Big Four Investment Company - 1927-1930
- Pierce Estate - 1930 (tax sale; reconfirmed title in 1932 via public auction) - 1948
- Henry and Alfred Loomis - 1948-1968
- The Nature Conservancy - 1968
- Fish and Wildlife Service - 1968 - present

SPECIAL DESIGNATIONS

COASTAL BARRIER RESOURCES SYSTEM

The Coastal Barrier Resources Act (CBRA), Public Law 97-348 (96 Stat. 1653; 16 U.S.C. 3501 et seq.), of 1982 established the John H. Chafee Coastal Barrier Resources System (CBRS), comprised of undeveloped coastal barriers along the Atlantic Ocean, Gulf of Mexico, and Great Lakes coasts. The law encourages the conservation of hurricane prone, biologically rich, coastal barriers by restricting federal expenditures that encourage development, such as federal flood insurance through the National Flood Insurance Program. CBRA is a free-market approach to conservation. These

areas can be developed, but federal taxpayers do not underwrite the investments. CBRA saves taxpayer dollars and encourages conservation at the same time. CBRA has saved over \$1 billion and will save millions more in the future.

Approximately 3.1 million acres of land and associated aquatic habitat are part of the CBRS. The Service maintains the repository for CBRA maps enacted by Congress that depict the CBRS. The Service also advises federal agencies, landowners, and Congress regarding whether properties are in or out of the CBRS and what kind of federal expenditures are allowed in the CBRS.

The Coastal Barrier Improvement Act of 1990 expanded the CBRS and created a new category of lands known as otherwise protected areas (OPAs). OPA designations add a layer of federal protection to coastal barriers already held for conservation or recreation, such as national wildlife refuges, national parks and seashores, state and county parks, and land owned by private groups for conservation or recreational purposes, and discourages development of privately owned in-holdings. The only federal funding prohibition within OPAs is federal flood insurance. The CBRS currently includes 272 OPAs encompassing approximately 1.8 million acres of land and associated aquatic habitat (UFWFS 2002).

St. Vincent Island, Pig Island, and the 14 Mile mainland tract contain OPAs. The 11 Mile mainland tract managed by St. Vincent NWR is not currently part of any coastal barrier resource unit.

MARINE PROTECTED AREA

Internationally recognized for conserving natural, historical, and cultural marine resources, marine protected areas (MPAs) are intended to protect marine species and habitats, while also providing for sustainable recreation, sustainable commercial activities, enhanced research opportunities, and expanded educational opportunities. The refuge was listed as a Candidate MPA, as defined under Executive Order 13158 (signed May 26, 2000). Under this executive order, an MPA is defined as “any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” Areas meeting this definition are intended to serve as the building blocks for a national MPA system. Such a system will form a network for addressing marine issues through pooled funding from the mix of MPA entities, shared research, increased available data, and enhanced protection across a system or throughout a species’ range. The MPA system is expected to benefit marine species that utilize these refuges. A total of 225 nominations for the MPA were received, 99 of which are national wildlife refuges. Finding them to be eligible for the national system, the National Marine Protected Areas Center has accepted the nominations for all 225 sites and placed them on the List of National System MPAs in April 2009, including St. Vincent NWR.

NATIONAL ESTUARY PROGRAM

Established by the Coastal Zone Management Act of 1972, the National Estuarine Research Reserve system is a partnership program between the National Oceanic and Atmospheric Administration and coastal states. St. Vincent NWR is a part of Apalachicola National Estuarine Research Reserve (ANERR) that was established in 1979. ANERR, with 246,766 acres of land and water, is the second largest of 27 National Estuarine Research Reserves in the country. The reserve focuses on long-term research, water quality monitoring, and educational and coastal stewardship of the Apalachicola River and Bay area. A unique feature of ANERR is the extensive multiple agency involvement. One of the most productive estuarine systems in North America, Apalachicola Bay receives water from a drainage basin which extends into Alabama and Georgia. In 1984, the United Nations Education, Scientific, and Cultural Organization (UNESCO) designated the Reserve as a Biosphere Reserve (Central Gulf Coast Plain) under the International Man and the Biosphere (MAB) program (Edmiston 2008).

STATE AQUATIC PRESERVES

Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas (CAMA) currently manages 41 aquatic preserves. The Florida Aquatic Preserve Program is designed to set aside state-owned submerged lands which have exceptional biological, aesthetic, or scientific value for the benefit of future generations (F.S. Section 258.36). The aquatic preserves include state owned lands and water bottoms, and lands owned by other governmental agencies specifically authorized for inclusion in the preserve (F.S. Section 258.40).

Apalachicola Bay Aquatic Preserve and St. Joseph Bay Aquatic Preserve are adjacent to the refuge (Figure 7). Apalachicola Bay Aquatic Preserve which encompasses part of St. Vincent NWR was designated by the governor and cabinet in 1969. The Preserve area covers 80,000 acres of sovereign submerged lands including all tidal lands and islands, sandbars, shallow banks, submerged bottoms and lands waterward of mean high water to which the state holds title (BSL 1992).

St. Joseph Bay Aquatic Preserve encompassing 73,000 acres surrounds a part of St. Vincent NWR know as Pig Island in St. Joseph Bay. St. Joseph Bay is host to one of the richest and most abundant concentrations of marine grasses along the north Florida coast.

Critical Habitat

Critical habitat designation is required by the U.S. Endangered Species Act. It serves to delineate specific geographic areas that are essential for the conservation of a threatened or endangered species and may require special management considerations and where Federal agencies are required to consult with the Service on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat.

On July 10, 2001 critical habitat was designated for wintering Piping Plover. St. Vincent NWR is part of critical habitat unit FL-8. This unit includes Indian and West Passes, and St. Vincent Point, as well as, part of neighboring Cape St. George State Reserve.

Fourteen geographic areas (units) among the Gulf Of Mexico Rivers and marine waters were designated as critical habitat for Gulf sturgeon on May 19, 2003. All estuarine waters surrounding St. Vincent Island and Gulf waters out to one nautical mile are part of critical habitat unit 13 (Apalachicola Bay). This includes waters offshore of the 11 and 14 Mile mainland tracts. No critical habitat designation for either species includes Pig Island.

OUTSTANDING FLORIDA WATERS

The Outstanding Florida Waters (OFWs) designation is given to waters that are “worthy of special protection due to their natural attributes” (§403.061, Florida Statutes); these waters are listed in Section 62-302.700, Florida Administrative Code (FAC). The intent of an OFW designation is to maintain ambient water quality. All permanent water bodies within national parks, national wildlife refuges, and state parks have been designated as OFWs. Other OFWs may also be designated as “Special Waters” based on a finding that the waters are of exceptional recreational or ecological significance and are identified as such in Rule 62-302, FAC, in which the Apalachicola River is listed. 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.

Figure 7. Florida Aquatic Preserves



SURFACE WATER CLASSIFICATION

All surface waters of the Florida have been classified by Florida Department of Environmental Protection according to their designated use (FAC, 2006). The 5 water quality classifications are:

Class I - Potable water,

Class II - Shellfish propagation or harvesting,

Class III - Recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife,

Class IV - Agricultural water supplies,

Class V - Navigation, utility and industrial use.

The degree of protection ranges from class I with the most stringent water quality criteria to class V with the least. The water surrounding all units of St. Vincent NWR is considered class II waters.

Class II water standards are more stringent concerning bacteriological quality than any other class due to the fact that shellfish, oysters and clams, are consumed uncooked by humans.

NATIONAL GEOGRAPHIC FRAMEWORK

In addressing its mission to conserve wildlife and their habitats throughout the country for the 21st century, the Service plans to use a landscape approach. With this approach the Service is in the progress of establishing Landscape Conservation Cooperatives (LCCs) which are conservation-science partnerships between the Service, U.S. Geological Survey (USGS), and other federal agencies, states, tribes, non-governmental organizations (NGOs), universities and stakeholders within a geographically defined area. LCCs will integrate science and management in support of Strategic Habitat Conservation (SHC), which is landscape-scale biological planning, conservation design, monitoring and research. The concept of LCCs represents a formal relationship between management and science communities wherein each participates in creating a shared conservation vision and commits to creating the science capacity needed to efficiently achieve that vision.

The national geographic framework (Figure 8) for which LCCs are being established comprise of 22 geographic areas that were developed by aggregating Bird Conservation Regions (BCRs) biologically based units representing long-standing partnerships that facilitate conservation planning and design at landscape scales. St. Vincent NWR is located in the Gulf Coastal Plains and Ozarks LCC and on the border of the South Atlantic LCC.

REGIONAL CONSERVATION PLANS AND INITIATIVES

STATE WILDLIFE ACTION PLAN

As a requirement for participating in the federal State Wildlife Grants Program, each state and territory has created a Comprehensive Wildlife Conservation Strategy for conservation of a broad array of fish and wildlife. Throughout the development process, the objectives were to identify species of greatest conservation need and their habitats and to develop high-priority conservation actions to abate problems for those species and habitats. These objectives have been developed in a prudent effort to prevent declines before species become imperiled, thereby saving millions of tax dollars. In addition, the matching requirement has encouraged partnerships and cooperation among conservation partners. To meet the intent of the Service's State Wildlife Grants Program, the Florida Fish and Wildlife Conservation Commission (FWC) created Florida's Wildlife Legacy Initiative (Initiative). The goal of the Initiative was to develop a strategic vision for conserving all of Florida's wildlife. Florida's Comprehensive Wildlife Conservation Strategy (FCWCS) was completed and approved in 2005. The FCWCS emphasizes the building of partnerships with other agencies and the private sector, uses a habitat-based conservation approach, incorporates a broad definition of wildlife

(to include invertebrates, aquatic species, and other species), and favors non-regulatory methods in its effort to reach conservation goals and objectives, many of which provided useful guidance in developing CCP benchmarks. A variety of species and habitats found on the refuges are listed in the FCWCS as needing special management protection.

ENDANGERED SPECIES ACT RECOVERY PLANS

Several species known to occur on the refuge or surrounding waters are listed under the federal Endangered Species Act as threatened or endangered (Appendix I). Endangered means that a species is in danger of extinction throughout all or a major portion of its range. Threatened means that a species is likely to become endangered within the foreseeable future. Under the Act, all federal agencies must use their authorities to conserve listed species and make sure that their actions do not jeopardize the continued existence of listed species. They must protect these species and preserve their habitats. Recovery plans are developed for each federally listed threatened or endangered species with the objectives of restoring the species to a healthy population.

FLORIDA BIRD CONSERVATION INITIATIVE

The Florida Bird Conservation Initiative (FBCI) was formed as a voluntary public-private partnership that seeks to promote the sustainability of native Florida birds and their habitats through coordinated efforts that strategically address critical needs related to conservation planning, delivery of conservation programs, research and monitoring, education and outreach, and public policy. FWC works with the Atlantic Coast Joint Venture and a wide variety of conservation partners in the State of Florida to serve FBCI goals. The FBCI will address bird conservation over the entire State, including two joint ventures and two bird conservation regions (BCRs 27 and 31).

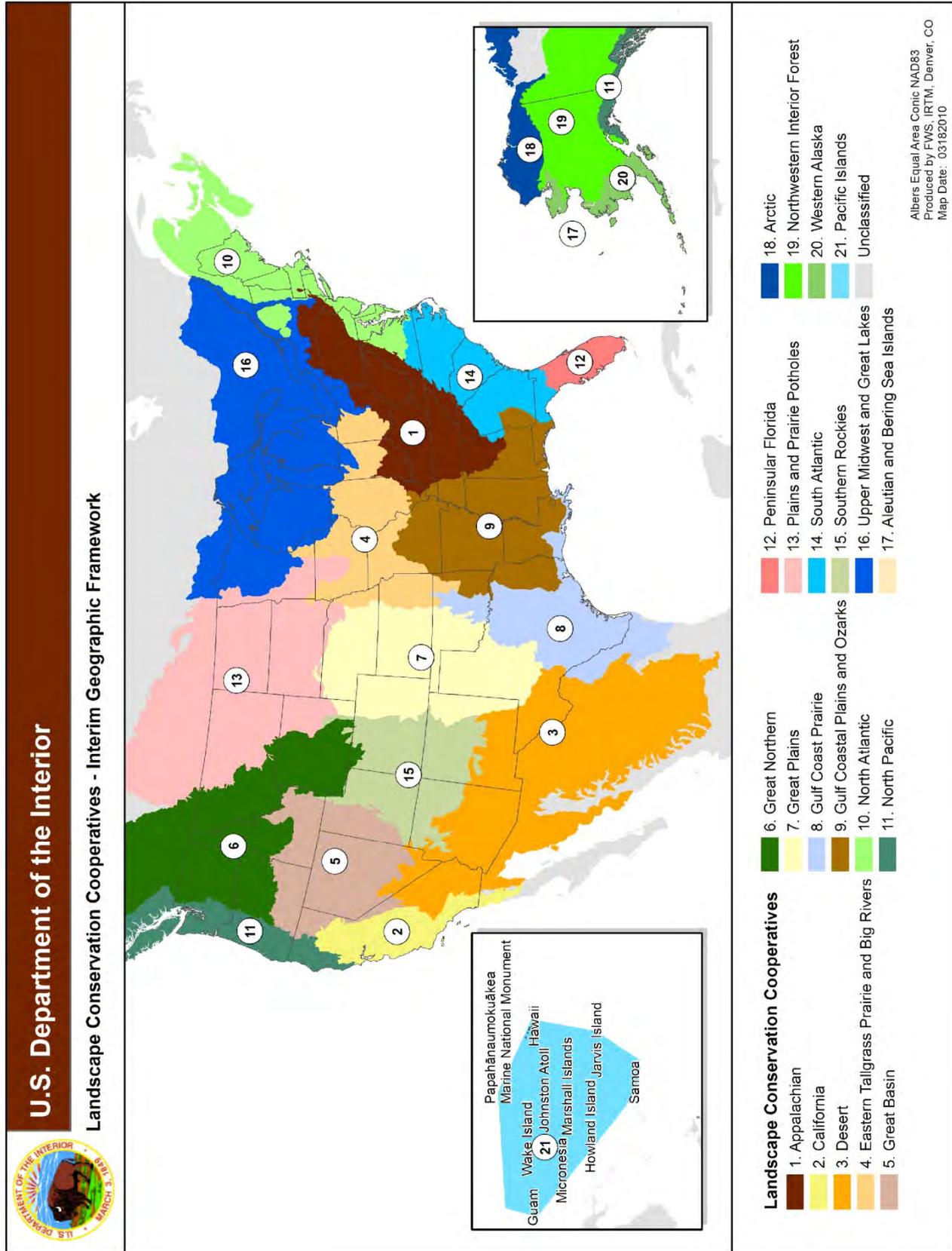
FLORIDA NATURAL INVENTORY

The Florida Natural Areas Inventory (FNAI) is a non-profit organization administered by Florida State University dedicated to gathering, interpreting, and disseminating information critical to the conservation of Florida's biological diversity. The Inventory was founded in 1981 as a member of The Nature Conservancy's international network of natural heritage programs. The databases and expertise of FNAI facilitate environmentally sound planning and natural resource management to protect the plants, animals, and communities that represent Florida's natural heritage. The Florida Natural Areas Inventory is the primary source of information on Florida's conservation lands. The Inventory databases include boundaries and statistics for more than 1,600 federal, state, local, and privately managed areas, all provided directly by the managing agencies. FNAI includes sites and sightings on the refuge.

GULF OF MEXICO PROGRAM

The Gulf of Mexico Program (GMP) was formed in 1988 by the Environmental Protection Agency as a non-regulatory, inclusive partnership to provide a broad geographic focus on the major environmental issues in the Gulf (EPA 2011). The Program provides a tool to leverage the resources of 18 different federal agencies; a variety of environmentally-minded agencies from the states of Alabama, Florida, Louisiana, Mississippi, and Texas; and numerous public and private organizations. Under the umbrella of the GMP is Florida's Gulf Ecological Management Site (GEMS) Program (FDEP 2011), which through the cooperation of federal, state, local, and private programs, resources, and mechanisms is identifying special ecological sites and providing information for each site in an informational database. St. Vincent NWR is a part of the GEMS Program.

Figure 8. Geographic Framework



ECOLOGICAL THREATS AND PROBLEMS

PROLIFERATION OF INVASIVE PLANT AND ANIMALS

The introduction of exotic and nonnative plants and animals on the refuge has threatened the composition of the native habitats. Non-native wildlife is an issue of which the refuge administration has struggled with for many years. Animals like feral hogs, have caused extensive habitat damage and alteration as well as destroyed numerous sea turtle nests. Presently, the refuge has an opportunistic maintenance program including hunter harvest for controlling the feral hog population thus reducing damage to habitat and threatened/endangered species. Chinese tallow (*Sapium sebiferum*) is a tree that grows and spreads rapidly, is difficult to kill, and tends to take over large areas by out-competing native plants. It was introduced from Asia and is planted widely as an ornamental tree. Birds disperse the seed, which have spread within the refuge where it is a threat. This species has been especially invasive around Lakes 4 and 5.

ALTERED FIRE REGIME

Fire has historically played an important role in defining the habitats of the refuge. Fires occurred naturally from lightning strikes, ignited surrounding vegetation (fuels) and then spread to adjacent habitats across the refuge. Fires historically occurred as low intensity, frequent surface fires (from two to five year return intervals) throughout the refuge (citation). As a response, many of the native habitats contain plant species that are adapted to exposure of frequent fire and depend on fire for growth.

One ecological threat to fire-adapted habitats throughout the refuge system is the loss of the ability to apply controlled burning (prescribed fire) on the landscape to mimic natural historical fire regimes. There are many factors that limit the use of prescribed fire application in refuge management including increased habitat fragmentation that prevents the ability of fire to spread across a landscape, increasing wildland-urban interface concerns related to human development adjacent to refuge boundaries, smoke concerns and reduction in funding support. As a result of the reduction of prescribed fire application, vegetation changes and increased fuels alter the habitat structure and ultimately the severity of fires. An increase in vegetation and fuel accumulations over time will lead to higher intensity and burn severity impacts of habitat structure and could lead to severe loss of habitat in extreme cases.

Currently the refuge has several habitats defined as fire-adapted habitats and frequent fire should be applied to maintain good quality habitat structure for wildlife. These fire adapted communities include: pine flatwoods, grasslands, and marshes.

ALTERED HYDROLOGY

The natural hydrology of a region is directly responsible for the connectedness of wetlands and indirectly responsible for the complexity and diversity of habitats through its effects on topography and soils. Natural resource managers recognize the importance of dynamic hydrology to wetlands and habitat relationships.

There have been significant alterations in the region's hydrology due to dams, urban development, river channel modifications, and degradation of aquatic systems from excessive erosion, major storm events, and salt-water intrusion. St. Vincent NWR is no exception to the altered hydrology of the region. Over the years numerous miles of roads, water structures, major storm events, erosion and saltwater intrusion has affected the refuge. Prior to becoming a refuge, St. Vincent Island's natural flow of surface water was altered by road and ditch construction that supported the timbering of pine.

The past activities placed fill in the creeks and drainages to create raised roadbeds. These activities changed the natural surface flow by acting as an earthen dam that impounded creeks, restricted flow which increased the depth of water in the channels of the creeks, blocked natural movement of saltwater causing altered water salinity and in some areas lowered land-surface elevations. There have also been ditches dug in some areas to manipulate the movement of surface water.

CLIMATE CHANGE AND SEA LEVEL RISE

Department of the Interior Secretarial Order 3226 states that there is a consensus in the international scientific community that global climate change is occurring and that it should be addressed in governmental planning and decision making. S.O. 3226 was amended on January 16, 2009; however, S.O. 3285 issued on March 11, 2009 replaced Amendment Number 1 and re-instated some of the provisions of the 2001 Order. S.O. 3285 established a Climate Change Response Council within the Office of the Secretary, DOI. Its purpose is to facilitate a Department-wide approach for applying scientific tools to increase the agency staff understanding of climate change and to coordinate an effective response to the impacts of climate change upon tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. It also made production and transmission of renewable energy on public lands a priority for the Department. The Order calls for the incorporation of climate change considerations into long-term planning documents such as the CCP. Projecting the impacts of climate change is hugely complex. The effects of climate change on populations and range distributions of wildlife are expected to be species-specific and highly variable, with some effects considered negative and others considered positive.

Meteorological and climatological events such as hurricanes and sea level rise, pose challenges for refuge management. Further, climate change related stressors will likely enhance the negative impacts of other stressors. Climate change may exacerbate shoreline erosion due to rising seas (Doyle 1998, Natural Resources Defense Council 2001, Zhang et al. 2004, Bindoff et al. 2007, Holland and Webster 2007, Nicholls et al. 2007) and may result in an increase in the intensity and frequency of tropical cyclones (Emanuel 1987, Emanuel 2005, Webster et al. 2005, Mann and Emanuel 2006). Low-lying islands will face impacts from global climate change, particularly rising sea level and coastal storms. Such effects have already been experienced in the past; however, these events may become more frequent and severe within the 15-year time period covered by the final CCP, based on recent projections by the Intergovernmental Panel on Climate Change (IPCC) (Intergovernmental Panel on Climate Change 2007). St. Vincent Island, as all barrier islands, is dynamic in nature and the shape of the island varies over the course of time. When sea level is falling, accommodation space, the space that is available for sediment accumulation (Boggs 2000), decreases and sediment becomes available to be added to the barrier island. A falling sea level can also be associated with increased erosion of the offshore shelf as a result of lowered wave base. This can increase the amount of sediment supplied to the beach ridge plain. When sea level rises, water depth increases and accommodation space also increases. Sediment will then accumulate offshore and is not available to the barrier island. Rising sea level may also be associated with erosion of the ridges. The most immediate actions that the Service can take are to gather the best scientific data possible for understanding natural processes in their current state, model possible impacts and subsequent changes from sea level rise, and develop adaptive management strategies for future conservation needs.

Although direct impacts to refuge resources are currently unknown, likely changes and stressors include alterations in wildlife populations and ranges, increased storm intensity, increased drought severity and persistence, and increased density and diversity of exotic and invasive species. And, these are likely to exacerbate other stressors, resulting in decreased water quality, altered water quantity and timing of flows, and increased pollution.

While specific impacts on the refuge's habitats and wildlife from climate change cannot be predicted with any certainty, it is certain they will occur, adding to the stresses this heavily modified landscape already faces.

PHYSICAL RESOURCES

CLIMATE

The climate of the Apalachicola area is affected by the adjacent Gulf of Mexico and is characterized as a moderate climate with long, warm growing seasons and mild winters (Sasser et al. 1994). Summer is characterized by afternoon thunderstorms caused by the moist, unstable air produced from the surrounding Gulf of Mexico waters. Thunderstorms are generally intense and occur over a short period of time during 2 to 4 days each week. In general, these thunderstorms produce little significant rainfall, but occasionally can produce 2 to 3 inches of rain in less than 2 hours. The greatest amount of precipitation recorded for the Apalachicola region was 11.7 inches in September 1932. Humidity is high in this area as a result of the adjacent Gulf of Mexico waters. Average summer temperatures for June, July, and August hover around 80 degrees Fahrenheit (°F). Winter temperatures for December, January, and February fall to 55°F. The last freeze date for spring is February 2, and the first freeze date in fall is December 21 giving a 322 day potential growing season for the area. Precipitation in the Apalachicola area follows two rain periods. The summer rainy season from June through September contributes an average of 30 inches of rain a year while the winter rainy season (December through April) contributes an average of 16 inches per year with May, October, and November being generally drier months. Total average precipitation is about 56 inches per year. The prevailing winds are from the north in the winter and south in the summer with an average windspeed ranging from 6.5 to 7.9 miles per hour (mph). A record windspeed of 85 miles per hour was recorded during Hurricane Kate, November 1985.

GEOLOGY AND TOPOGRAPHY

Portions of this section were taken directly from Grace 2000. A Final Report of the Vegetation Survey and Map Project for St. Vincent National Wildlife Refuge, Apalachicola, Florida. A USFWS USGS Research Partnership Program Project. U.S. Geological Survey. Lafayette, LA. 78pp.

During the early part of the Cenozoic, the Paleocene (67 to 24 million years ago (mya)), the siliciclastic sediment was being deposited from the Appalachian Mountains into the central and western panhandle of Florida. However, the significant carbon deposition didn't occur until Late Eocene (~ 40 mya) and continued in the central panhandle through the late Oligocene (~ 28 mya). During the late Oligocene to the early Miocene (24 mya) a new sediment deposit occurred along the coastline. Additional deposits occurred along the coastline during the Pliocene (5 to 2 mya), Pleistocene (2 mya to 10,000 mya) and Holocene periods (10,000 mya – present). The structure affecting the deposition of sediment in the area of the refuge throughout time was known as the Apalachicola Embayment.

Table 2. Geologic Time Chart- Cenozoic Era

Era	Period	Epochs	Began (million years ago)	Ended (million years ago)
Cenozoic	Quaternary	Holocene	0.01	present
		Pleistocene	1.8	0.01
	Tertiary	Pliocene	5.3	1.8
		Miocene	23.0	5.3
		Oligocene	33.9	23.0
		Eocene	55.8	33.9
		Paleocene	65.5	55.8

Source: United States Geologic Survey, http://vulcan.wr.usgs.gov/Glossary/geo_time_scale.html

The sediments of Oligocene period in the central and western panhandle are characteristically assigned to Marianna, Bucatunna and Chickasawhay formations (Miller 1986). The Miocene formations are found approximately 300 to 450 feet below mean sea level and include the St. Mark's (early Miocene in age), Bruce Creek Limestone (late to mid Miocene in age), Alum Bluff Group (late Miocene to late Pliocene in age) and Intracoastal (mid Miocene to late Pliocene) formations. These formations are mostly composed of limestone with some thin beds of sand and clay present. The Intracoastal formation overlies the St. Mark's Formation and Bruce Creek Limestone Formations and occurs up to 175 feet below mean sea level in the vicinity of St. Vincent Island. Pliocene-Pleistocene formations that occur in this area and below the island includes the Alum Bluff Group (late Pliocene in age to 2 million years ago), which is composed of unconsolidated sandy, shelly limestone in a clay matrix and sandy shell beds. More recent Pleistocene and Holocene deposits of undifferentiated surface sediments (alluvium and marine terrace deposits), overlie the Alum Bluff deposits and are less than 11,000 years old. These Holocene deposits make up the surface geologic layers of St. Vincent Island and surrounding area.

The geology of the Florida Panhandle coast of has been strongly influenced by the Apalachicola River. The Apalachicola River is the largest river in Florida and 21st largest in the contiguous United States (Donoghue and Tanner 1994) with a drainage basin covering an area of over 60,000 square km (McKeown et al. 2004) and having a mean discharge of 660 m³/s (Raney et al. 1985).

Throughout the Holocene, the Apalachicola River and its delta have migrated in a southeasterly direction (Donoghue and White 1995). During periods of rapid sea-level rise, this southerly migration was punctuated by retreats. As sea level rose through the Holocene, the mouth of the Apalachicola River retreated northwards up the Apalachicola River Valley. This movement has been the driving force behind the creation of relict quaternary shoreline features. The Apalachicola River was the major sand source for the Panhandle coast (Donoghue 1993; Lamont et al. 1997). The Apalachicola River delivered sediment at a rate faster than the coastal wave energy was able to dissipate it

(Tanner 1964). As a result, about 5,000 to 6,000 years ago the excess sediment load accumulated in the barrier islands, spits and shoals that now rim the river's mouth. From east to west the barrier islands include Dog Island, St. George Island, Little St. George Island and St. Vincent Island.

Barrier islands are narrow, sand-dominated landforms that run parallel or semi-parallel to mainland shorelines. They are usually separated from the mainland by a lagoon, estuary or marsh system. The stratigraphy and evolution of a barrier island is influenced by several factors including sea level, sediment supply, pre-depositional topography, tectonic setting and tidal range. Barrier island formation is a complex and poorly understood process. However, there has been significant study and interpretation of the geologic history of St. Vincent Island and the geologic formation of the barrier islands of Apalachicola Bay (Stapor 1977, Tanner 1964, Donoghue 1993, Forrest 2007, and López 2008). More than 100 ridges have been formed over St. Vincent Island's approximately 4,000-year history (Forrest 2007). Many of these ridges are marked by eolian decoration. Figure 9 shows 12 ridge sets separated by geomorphological (orientation), sedimentological, and elevation characteristics that suggest that St. Vincent Island was formed from a series of sand ridges that were deposited from the northeast end of the island (the oldest ridges) to the south/southeast end of the island (youngest sand ridges).

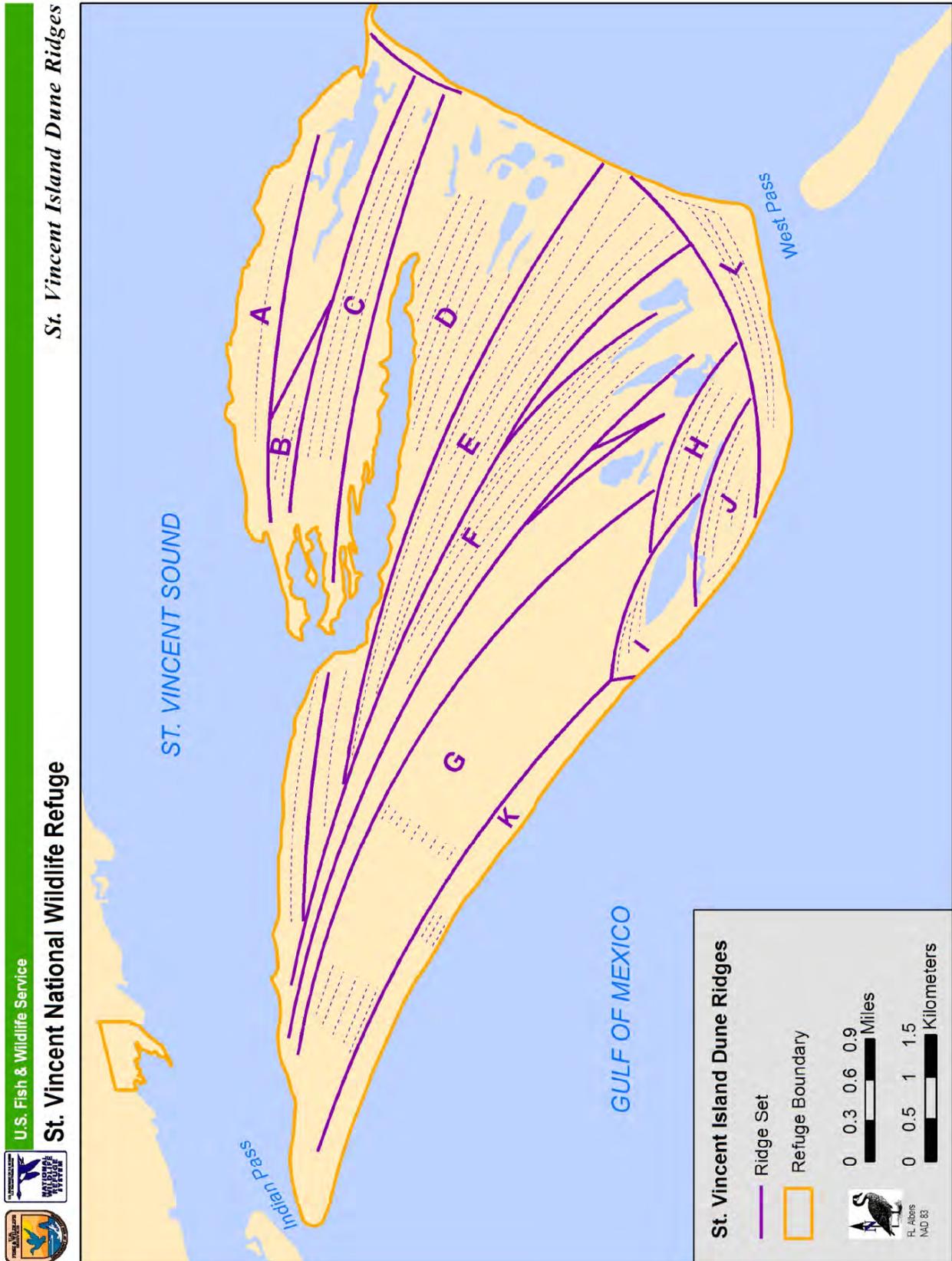
The oldest sand ridges (ridge sets A, B, C) on the island have been dated by various researchers with different techniques to which the age is between 3,000 and 6,000 years old. Ridge sets D, E, F, and G are aged by most researchers to be between 1,000 and 4,000 years old while ridge sets H, I, J, K are 3,000 to 500 years old.

Based on mean grain size and standard deviation, the material making up the beach ridges on St. Vincent Island can be classified as well-sorted, mature, fine-grained sand. This has held true over the course of the island's history. However, the sand comprising the younger sets is generally slightly better sorted and slightly coarser grained than that found in the older sets. This implies an increase in wave energy in recent years. This increase in wave energy was likely a direct result of sea-level rise. Alternatively, this could be a result of increased storm frequency in recent times (Forrest 2007).

Stapor (1973) also suggests a possible sea-level rise approximately 2,000 to 3,000 years ago, which drowned the older ridges and created Big Bayou. Following this increase in sea level, the sand ridge deposition forming St. Vincent Island changed the orientation to a more southeast-northwest one. Also following this sea-level rise, St. George shoal developed, beaches of Cape St. George Island formed, and Pig Island formed as the beginning of Cape San Blas shoal developed. These newly developed islands continued to grow from sand ridge depositions 1,000 to 2,000 years ago. The formation of the deep and narrow West Pass Channel between St. Vincent Island and Cape St. George Island led to the formation of the youngest sand ridges on St. Vincent Island. As a result of the deep West Pass channel formation, the youngest deposited sand ridges have been deposited at more northeast-southwest orientation, almost perpendicular to the orientation of the older sand ridges on the island (L). Donoghue et al. (1990) suggests that the youngest sand ridges on the southeast portion of the island are currently undergoing erosional processes because of less sand availability for deposition.

St. Vincent Island is stabilized by mature vegetation. However, a recent topographic survey suggests that a large ridge was eroded between 1977 and 2006 (Forrest 2007). This ridge was surveyed during the Stapor and Tanner 1977 survey but is not present today. Despite the increase in storm frequency that may be seen in the St. Vincent Island data (the removal of the ridge from set K and the increase in energy seen in the granulometric results), the island has not been overwashed or destroyed during any historical high magnitude storm (Forrest 2007).

Figure 9. Dune Ridge Sets on St. Vincent Island (Source: Stapor 1973)



SOILS

There are 19 soil types mapped for St. Vincent NWR (Figure 10), with some overlap among the refuge units (Table 3): 14 soil types mapped for St. Vincent Island, 5 soils mapped for the mainland unit and 4 mapped for Pig Island (Natural Resources Conservation Service 2010). The following is a description of each soil type and a general description of its mapped location on the refuge. All descriptions are summarized from the soils surveys conducted in Franklin and Gulf Counties (Sasser et al. 1994, Schuster et al. 2001) and the vegetation survey project for St. Vincent NWR (Grace 2000).

Portions of this section were taken directly from Grace 2000. A Final Report of the Vegetation Survey and Map Project for St. Vincent National Wildlife Refuge, Apalachicola, Florida. A USFWS USGS Research Partnership Program Project. U.S. Geological Survey. Lafayette, LA. 78pp.

Bayvi and Dirego soils- These are very poorly drained soils of nearly level (<1% slope) tidal and estuarine marshes. Generally this soil complex is made up of 50% Dirego and 40% Bayvi soils. The surface soil of Dirego soil is brown muck to 35 inches with subsurface sand to 72 inches. The surface soil of Bayvi soil is mucky sand to 8 inches and a subsurface layer of sand to 80 inches. Both soil types have a water table at or above the surface throughout the year and are tidally influenced. Dirego soils have a high organic content (25 to 60%) whereas the Bayvi soil has a moderate organic content (8 to 20%). Both soil types are of low fertility and have high salinities. This soil type has a low occurrence on St. Vincent Island and is found in the marshes to the north of Big Bayou, in the northwest portion of St. Vincent Island. It also makes up the soils of the marshes of the southern portion of Pig Island and 14 Mile site.

Duckston, 25% Bohicket and 15% Corolla soils. Duckston occurs on very low ridges, on nearly level flats, and in swales; Bohicket occurs in narrow, elongated marshes between low dune ridges and Corolla soil occurs on low dune ridges. This soil complex has moderate to high occurrence on St. Vincent Island. It occurs predominately on the northern portion and a small amount in the southeastern corner of the island. This soil complex is also associated with the hardwood hammock communities, southeast of St. Vincent Creek Outlet.

Duckston-Rutledge-Corolla complex- This complex is made up of very poorly drained to somewhat poorly drained soils of nearly level terrain (0 to 2% slopes). This complex occurs on low ridges, flats and swales of barrier islands. This complex is made up of 50% Duckston, 25% Rutledge and 25% Corolla soils. Rutledge soils occur in low swales, Duckston in flats and Corolla in low ridges. See previous descriptions for characteristics of individual soil types. The majority of St. Vincent Island is made up of this soil complex. It occurs predominantly in the southern and middle of the island. This complex is closely associated with the pine flatwoods forest communities that are the dominant vegetation class of the island.

Kershaw sand- This is an excessively drained soil of sloping to strongly sloping (5 to 12%) terrain. It occurs on side slopes and tops of high sandy ridges. The surface layer is composed of 5 inches of gray sand with brown fine sand below to a depth of 80 inches. There is no water table within 80 inches of the soil surface. This soil has a low organic content (<1%) and low fertility. This soil type has a low occurrence on St. Vincent Island and occurs on two sand ridges on the southeast corner of the island. It occurs in association with live oak hammocks.

Figure 10. Soil Types for St. Vincent NWR

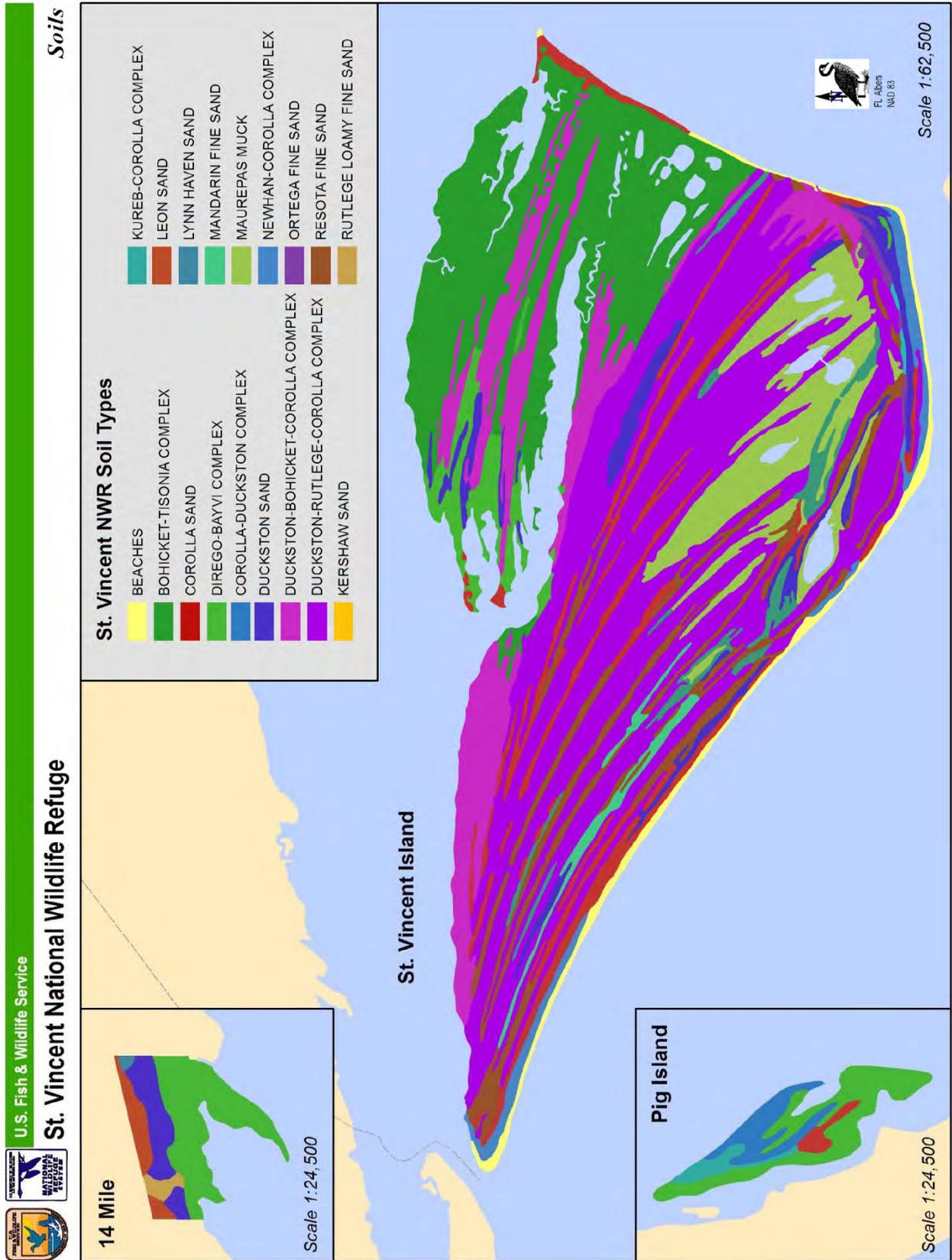


Table 3. List of soils on St. Vincent NWR

Soil Type	Approximate Acres	St. Vincent Island	14 Mile	Pig Island
<i>Bayvi-Dirego complex</i>	397	X	X	X
<i>Beaches</i>	230	X		
<i>Bohicket-Tisonia</i>	2243	X		
<i>Corolla sand</i>	810	X		X
<i>Corolla-Duckston complex</i>	19			X
<i>Duckston sand</i>	442	X	X	
<i>Duckston-Bohicket-Corolla complex</i>	1260	X		
<i>Duckston-Rutledge-Corolla complex</i>	4046	X		
<i>Kershaw sand</i>	11	X		
<i>Kureb-Corolla complex</i>	9			X
<i>Leon sand</i>	12		X	
<i>Lynn Haven sand</i>	1		X	
<i>Mandarin fine sand</i>	125	X		
<i>Maurepas muck</i>	918	X		
<i>Newhan-Corolla complex</i>	203	X		
<i>Ortega fine sand</i>	44	X		
<i>Resota fine sand</i>	721	X		
<i>Rutlege fine sand</i>	1		X	
<i>Rutlege loamy fine sand</i>	258	X		

Kureb-Corolla complex- This soil complex is made up of excessively to moderately drained soils that are found in nearly level to strongly sloping terrain. These soils are found in sand dune ridges along the coast and in low rises in flatwoods. The profile for both soils consists of sandy soil to 80 inches. This complex is made up of 65% Kureb, and 30% Corolla soils. This soil complex is found in the sand dunes along the western portion of Pig Island.

Beach soils- Beaches are deposits of loose, fine sand (ranging from gray to white) and shell fragments within the high tide mark. These fragments and sand are susceptible to movement by wind and tide. This soil type is of low fertility and low organic content. This soil type occurs in a small portion of St. Vincent Island and is restricted to the narrow strip of beach along the southern and eastern portions of St. Vincent Island from Indian Pass Point to West Pass Point and along most of the eastern portion of St. Vincent Island up to Mallard Slough. There is a small area of beach at St. Vincent Point on the island.

Bohicket and Tisonia soils- These soils are very poorly drained soils of nearly level (<1% slope) tidal and estuarine marshes. Bohicket soil has approximately 23 inches of gray silty clay in its surface layer to 80 inches of black silty clay. Tisonia soil profile has 4 inches of mucky peat in the surface layer, over 22 inches of brown muck below the surface layer, 66 inches of dark gray clay, and below this to a depth of 80 inches of sand and sandy clay loam. The water table of this soil complex occurs at or above the surface throughout the year and under tidal influence. Both soil types exhibit high salinities and fertility. This soil type occurs abundantly in the tidal marshes on the eastern portion of St. Vincent Island including Big Bayou, Mallard Slough, Sheepshead Bayou, and the marshes of the northwest portion of the island.

Corolla sand- This soil type is a somewhat poorly drained soil of nearly level to gently sloping terrain (<3% slope). It occurs on salt flats, small sand dunes and in swales of large dunes. The surface layer is composed of 6 inches of light gray sand and below the surface to 80 inches is more light gray sand. This soil type has a seasonally high water table at a depth of 18 to 36 inches for 3 to 6 months per year. Flooding can occur during coastal storms and hurricanes. This soil type has a low organic content (0.5%) and low fertility. This soil type is moderately abundant on St. Vincent Island. It occurs scattered throughout the island on some interior dunes and makes up the predominant soil type of the high dunes along the southern portion of the island. There is a small portion of this soil type found in association with the cabbage palm islands of the northwestern portion of the island at the mouth of Big Bayou. It also makes up the sand dunes along the southwestern portion of Pig Island.

Corolla-Duckston complex- The soils of this complex range from very poorly drained to moderately drained soils of nearly level to strongly sloping terrain. They occur on low dune-like ridges along the coast, low ridges and rises in flatwoods, and floodplains. This soil complex makes up the sandy dune areas of Pig Island, primarily located on the eastern portion of the island.

Duckston sand- This is a poorly drained soil on nearly level (0 to 2% slopes) terrain. It occurs on level flats adjacent to coastal dunes and marshes in low swales between dunes. The soil surface layer consists of gray sand 4 inches thick, and below the surface layer to 80 inches is more gray and white sand. There is a high water table in this soil type to a depth of 12 inches throughout the year. The water table may fluctuate with tides. This soil type can flood during storm events. There is a low organic content (3%) and this soil has low fertility. This soil type occurs in moderate abundance on St. Vincent Island. It is found in association with pine-cabbage palm flatwoods and swales of the southern portion of the island. On the southeast end of the island it occurs in pine-cabbage palm flatwoods adjacent to wetlands associated with Oyster Pond and pine-cabbage palm flatwoods associated with the high dunes along the coast of West Pass point. This soil type can also be found in the pine-cabbage palm flatwoods and swales in the northwest portion of the island on the western

along Dry Bar. This soil type occurs abundantly in the mainland unit. It is found in association with the pine flatwoods forest community of this unit and makes up about 20 to 30% of the unit.

Duckston-Bohicket-Corolla complex- This complex is made up of very poorly to somewhat poorly drained soils of nearly level terrain (0 to 2% slopes). This complex of soils occurs on low ridges, flats and in narrow, elongated tidal marshes on barrier islands. This complex is made up of 50%

Leon sand- This soil type is a poorly drained soil of nearly level terrain (0 to 2% slope). It occurs in broad flatwoods and on small inclines or low ridges in titi bogs. The surface layer is 8 inches of dark gray sand with brown gray to brown sand below to 80 inches. This soil type has a seasonally high water table at a depth of 6 to 12 inches 1 to 4 months per year. The soil has low to moderate levels of organic matter (0.5 to 4%) and has low fertility. This soil type is moderately abundant on the mainland unit. It occurs along the northern edge of the unit, in association with the pine flatwoods community of the unit.

Lynn Haven sand- This soil type is a poorly drained soil of nearly level terrain (0 to 2% slopes). This soil type is found in broad, depressional areas of flatwoods. The soil profile consists of a surface layer composed of 8 inches black sand with 14 inches below of dark gray sand. The subsoil to 80 inches is gray and brown sand. This soil type has a seasonal (late winter and early spring) high water table within a depth of 12 inches of the surface 4 to 6 months per year and a depth of 30 inches the rest of the year. The organic content of the soil is moderate (0.2 to 4%) with low fertility. This soil type occurs in low abundance only on the mainland unit. It is primarily located along the east end of the unit and along a small north-south section through the middle of the unit.

Mandarin fine sand- This soil type is somewhat poorly drained in nearly level soil (0 to 3% slopes) of low coastal ridges and small inclines in flatwoods. The surface of this soil type has 4 inches of gray fine sand and below this layer to 80 inches is more fine sand. There is a seasonally high water table present in this soil at a depth of 18 to 36 inches for 3 to 6 months per year. This soil has low organic content (<3%) and low fertility. This soil type has a low occurrence on St. Vincent Island. There are two locations in the interior of the island where this soil type is found. It occurs in two interior sand ridges that run along the southern half of the island in association with scrub oak plant communities.

Maurepas muck- This is a very poorly drained, organic soil of nearly level (<1% slope) brackish marshes and swamps. The surface layer consists of 6 inches of brown muck, and below that to a depth of 80 inches is brown muck. There is a high water table in this soil that is 6 inches above to 12 inches below the surface throughout the year. The water table is tidally influenced. The organic content and the fertility are high in this soil type. This soil type occurs in moderate to high abundance on St. Vincent Island. It is located in the southeastern portion of the island. This soil type is closely associated with the fresh and brackish marshes adjacent to the lakes and large ponds in the southeastern end of the island.

Newhan-Corolla complex- This soil complex is made up of excessively to somewhat poorly drained soils of gently undulating to steep terrain (5 to 15% up to 30% slope). This complex occurs in coastal dunes and swales. The Newhan soils occur in high dunes and the Corolla soils are soils of low dunes and swales. The Newhan soil surface has 1 inch of gray sand and has gray and white sands below to 80 inches. The surface layer of the Corolla sand is made up of 3 inches of dark gray sand with more gray sand below to 80 inches. Newhan soils do not have a water table within 80 inches of the surface whereas the Corolla soil has a seasonal water table at a depth of 18 to 36 inches 2 to 6 months per year (36 inches below surface the rest of year). Both soils have low organic content (0.5%) and low fertility. This soil type is in moderate abundance on St. Vincent Island and is found in two locations on the island. It is found along the tip of Indian Pass Point along the southwestern

corner and also occurs around West Pass Point along the southeastern portion of the island. This soil type occurs in association with the high sand dunes of the island.

Ortega fine sand- This soil type is moderately well-drained and in nearly level to gentle sloping terrain (0 to 5% slopes). It occurs on side slopes or in concave areas of sandy uplands. The surface layer consists of 5 inches of grayish brown fine sand and below this to 80 inches is more fine sand. This soil type has a seasonally high water table located at a depth of 60 to 72 inches for 6 months per year. The organic content of this soil is low (1 to 2%) and has low fertility. This soil type has a low occurrence on St. Vincent Island and is restricted to a small portion of the southeastern end of the island associated with live oak sand ridges.

Resota fine sand- This soil type is a moderately well-drained soil of nearly level or gently sloping (0 to 5% slopes) terrain. It occurs in coastal ridges and remnant sand dunes. The soil profile consists of a surface of 3 inches of fine sand with more fine sand to 80 inches below. There is a seasonally high water table at a depth of 40 to 60 inches 6 months per year. This soil type has low organic content (<1%) and has low fertility. The majority of interior sand ridges that run northwest-southeast across St. Vincent Island are made up of Resota fine sand, giving this soil type a moderate to high occurrence on the island. These sand ridges are mainly in the southwestern and south central portions of the island and are associated with the scrub oak communities of the interior of the island.

Rutledge fine sand- This soil type is very poorly drained of nearly level terrain (0 to 2%). It occurs on board, low-lying flats and on narrow flats adjacent to streams. The soil layer is composed of 13 inches of fine surface layer sand proceeding to 80 inches of grayish brown to gray sand. It has a seasonally high water table at or slightly above the surface for 3 to 6 months a year with the remaining year a depth within 20 inches. This soil type has a high organic content in the surface layer and low in the rest of the profile. A small area in the northwest corner of the mainland unit supports this soil type.

Rutledge loamy fine sand- This is a very poorly drained soil of nearly level terrain and depressions (<2% slope). The surface layer is composed of 5 inches of black loamy fine sand with fine gray sand below the surface to 80 inches. There is a seasonally high water table present in this soil type at a depth of 24 inches for 3 to 6 months per year. This soil type has a high organic content in the surface layer and low throughout the rest of the profile. This soil type also has a moderate level of fertility. It has low to moderate occurrence on St. Vincent Island. It is found primarily on the southern half of the island adjacent to the large ponds and lakes of the southeastern section of the island. This soil type occurs in association with shrub thickets upstream from wetlands adjacent to Lakes 1, 4, and 5, and Oyster Pond. It also occurs in a narrow strip just south of Mallard Slough and is associated with a sawgrass marsh.

HYDROLOGY

Surface and sub-surface water movement patterns greatly influence the vegetation patterns on St. Vincent NWR. One surface-water movement study was conducted on refuge lands at St. Vincent Island in 1998 to 2000. Davis and Mokray (2000) documented sites where the natural flow of surface water on the Island had been altered by road construction. Two methods of surface-water flow occur on the island-- channel flow and sheetflow). They observed water-flow patterns at 261 sites. Of these, 250 sites exhibited channel flow, which is surface flow moving from uplands to creek channels. The remaining 11 sites demonstrated sheet flow—large, flat areas several hundred feet wide through which water flows in a large mass.

Rainfall is the source of the refuges surface-water flow. St. Vincent Island contains several lakes, bayous, and creeks (open water areas make up approximately 583 acres while the palustrine marsh habitat encompasses 668 acres). Base flow in the creeks is derived from seepage out of the surficial aquifer (Davis 2000). The ground water levels recharge rapidly on the island because of the high sand content of the soil that allows water to permeate down to the ground water table quickly.

The past road and ditch development has altered the natural surface water flow patterns and significantly altered vegetation patterns as well. In addition, water flow patterns on the island are manipulated by five water-control structures constructed between lakes on the southeastern portion of the island.

In 2006 the refuge began the process to implement the recommendation of the study by restoring the ridge and swale effect across Road 3. This was done by removing the road bed in the swales and replacing it in the ridge areas. In the summer of 2008, restoration work occurred in the northeastern part (Dry Bar) of the island. During the Dry Bar restoration 8 of the 11 sheetflow sites were restored by removal of road bed.

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 (O₃), nitrogen oxides (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and particle pollution ((10 microns or less in diameter (PM₁₀) and 2.5 microns or less in diameter (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 216 monitors in 34 counties throughout the state (FDEP 2006) however there are no monitoring sites in Franklin and Gulf Counties. Areas that meet the NAAQS standards are designated "attainment areas," while areas not meeting the standards are termed "non-attainment" areas or "unclassifiable" which is insufficient data to classify. Franklin and Gulf Counties are considered attainment areas however the entire state remains designated as not classifiable for PM₁₀.

The Air Quality Index (AQI) is a summary index for reporting daily air quality which 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: 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. 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 (U.S. Environmental Protection Agency, "AirNow," <http://www.airnow.gov/>). Franklin and Gulf Counties are considered to have good average air quality.

WATER QUALITY AND QUANTITY

The Apalachicola Bay is one of the most productive estuarine systems in the Northern hemisphere as a result of the overall good water quality (FDEP 2009). It is considered a unique and important biological resource. The Bay is feed by the Apalachicola River which has the largest flow of any river in Florida, with a mean annual flow of 25,000 cubic feet per second (cfs) (Florida Department of Natural Resources 1992).

The water surrounding St. Vincent NWR is considered class II waters. Class II water standards are more stringent concerning bacteriological quality than any other class due to the fact that shellfish, oysters and clams, are consumed uncooked by humans. The Florida Department of Agriculture and Consumer Services maintains bacteriological sampling stations in Apalachicola Bay to monitor the need to open and close the harvesting waters.

Red tides occur in the Gulf of Mexico almost every year, generally in the late summer or early fall. 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.

The water quality on St. Vincent NWR is related to the water quality in Apalachicola Bay. The refuge staff maintains impoundment waters, tidal pools and salt marsh through water exchange with Apalachicola Bay.

BIOLOGICAL RESOURCES

HABITAT

Earlier Vegetation Surveys

St. Vincent Island is an attractive place for botanical surveys due to its extensive diversity of native plants and plant communities. McAtee (1913) published the first plant list for St. Vincent Island. There was little plant inventory work following this survey for the next several decades. Thompson (1970) conducted an extensive survey of vegetation cover classes for St. Vincent Island and expanded the plant list generated by McAtee (1913). These surveys conducted by Thompson offered baseline data for general vegetation patterns for management operations of the refuge. Thompson's existing plant species list was expanded on the barrier islands of the Apalachicola National Estuarine Research Reserve including St. Vincent Island. Results of this study showed almost 600 plant species listed for St. Vincent Island (Anderson 1986, 1987, 1988). Additional plant inventories and vegetation surveys were conducted by FNAI in 1987 and have been updated.

The plant surveys of St. Vincent NWR during 1997 (Grace 2000) revealed eight new plant species not previously reported for the refuge. These results compiled with previous reports of plant surveys increase the total number of plant species. The great number of plant species reported for the refuge reflects the vast diversity of habitats included within the refuge boundaries. To manage these data efficiently and effectively for current and future managers of the refuge, a plant database was developed. This database includes the following fields: common name, genus, species, variety or subspecies (if present), author citation, plant family, flowering characteristics, flowering date, life history (annual, biennial or perennial), habitat (herbaceous or woody), life form (herb, shrub, tree, vine), origin (native or non-native), habitat, Florida status (common, frequent, occasional, rare), wetland status (obligate wetland, facultative wetland, facultative upland, obligate upland), species at risk (whether it is monitored by FNAI as a rare plant), and global rank (as defined by FNAI) for all plant species on the refuge. The software used to develop this database allows for the user to sort by any field given above, so refuge managers can access any part of the database needed to generate lists of plants that are of interest.

Invasive Species

There are 33 plant species listed for the refuge that are considered invasive species to Florida (Wunderlin 1997). The invasive species of the refuge represent 16 different plant families with grasses the largest family represented by 10 species (Table 4). Most of the invasive species introductions have occurred in human-altered sites within the refuge, specifically on roadsides, water control structures and open water canals. Some invasive species are introduced from high water floodings into natural communities but there is little evidence of wide establishment by this means of introduction. Current control management practices for each species can be found on the internet at: <http://aquat1.ifas.ufl.edu/welcome.html> (Center for Invasive and Aquatic Species). See appendix I for a list of invasive species found on the refuge.

Vegetation Map (Figure 11)

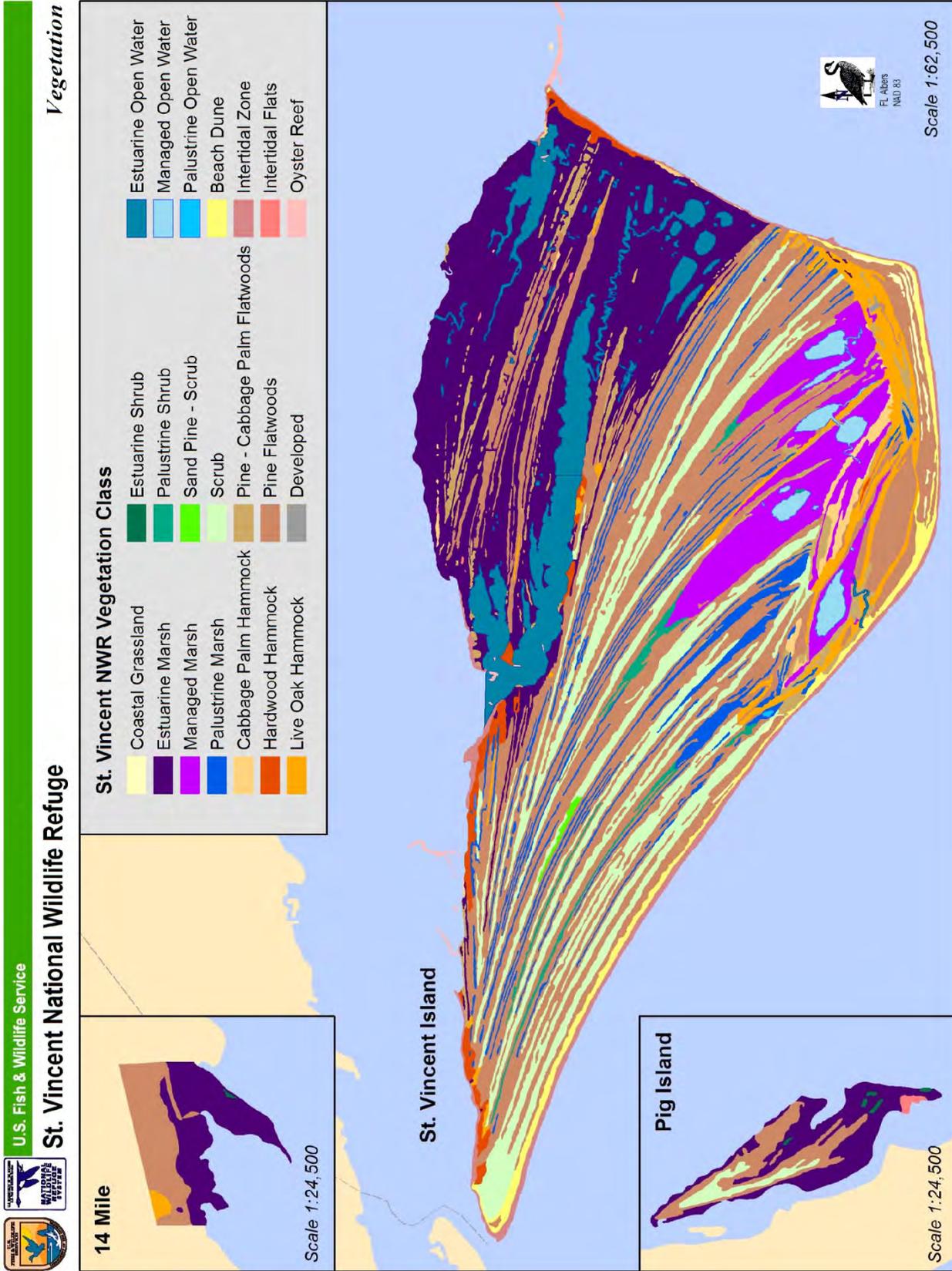
The diversity of vegetation on St. Vincent NWR has been described in 21 cover classes that, for the most part, reflect the major vegetation patterns of the refuge. The following describes the synonyms, extent, topography, soils, appearance, ecology, and associated plant species for each vegetation class. A cross reference of the vegetation classes is compared to the natural plant community descriptions for Florida (FNAI 1990) and previous studies are given in Table 5.

Table 4. A Cross Comparison of Vegetation Classes and Natural Plant Communities

Grace (2000)	FNAI (1998)	Thompson (1970)
Pine flatwoods	Mesic flatwoods	Slash pine-mixed understory Slash pine-saw palmetto- <i>Ilex</i>
Pine-cabbage palm flatwoods	Wet flatwoods	Slash pine-cabbage palm hammock
Cabbage palm hammock	Maritime hammock	Cabbage palm
Scrub	Scrub	Scrub oak dunes
Sand pine-scrub	Scrub	Sand pine-scrub oak
Live oak hammock	Xeric hammock	Mixed live oak-scrub oak Live oak dunes Live oak-grass dune
Hardwood hammock	Maritime hammock	Hardwood hammock
Coastal grassland	Coastal grassland	Slash pine-grass

Grace (2000)	FNAI (1998)	Thompson (1970)
Palustrine marsh	Swale	Sawgrass-emergent marsh Cattail
Palustrine shrub	Baygall, swale	Not identified
Palustrine open water	Coastal dune lakes	Freshwater pond
Estuarine marsh	Estuarine tidal marsh	Tidal marsh
Estuarine shrub	Estuarine tidal marsh	Not identified
Estuarine open water	Coastal dune lakes	Saltwater pond
Beach dunes	Beach dunes	Beach
Intertidal zone	Unconsolidated substrate	Beach
Oyster reefs	Mollusk reefs	Not identified
Intertidal flats	Unconsolidated substrate	Not identified
Developed	Not identified	Not identified
Managed marsh	Not identified	Not identified
Managed open water	Not identified	Not identified

Figure 11. Vegetation on St. Vincent NWR (Grace 2000)



Wildlife

St. Vincent NWR is home to a large variety of resident fish and wildlife species as well as provides resting, nesting, and foraging habitat for many migratory species. Currently the refuge has documented 277 bird species, 40 fish species, 42 reptile species, 11 amphibian species, and 28 mammal species that have used the refuge. A list of flora and fauna is contained in Appendix I.

Invertebrates

There has been no attempt to catalogue the plethora of invertebrates on the refuge, although some outside researchers have studied certain species or groups. The refuge coordinates annually with the USDA Forest Service to conduct exotic gypsy moth pheromone trapping. Invertebrates are also monitored in association with certain vertebrate studies such as collection and analysis of horseshoe crab eggs, *Donax* clams, polychaete worms, and mole crabs as food sources for red knot. Additionally, monarch butterflies have occasionally been tagged on the refuge by state wildlife researchers.

Fish

Due to the great diversity of aquatic habitats including the Gulf of Mexico, St. Vincent Sound, and Apalachicola Bay shorelines, lakes, ponds, tidal creeks, estuaries, and fresh and brackish impoundments, the refuge hosts a variety of fishes (see Appendix I). Thirty-nine total fish species have been documented on the refuge (including one exotic species, common carp (*Cyprinus carpio*)). Fish surveys, including an inventory of fishes occurring on the refuge, would provide important information for resource management. To support sportfishing, the refuge works with USFWS Fisheries Resources staff to stock the managed impoundments with gamefish such as largemouth bass and bluegill.

Amphibians

There are 11 amphibian species (one salamander and 10 frogs and toads) that occur on the refuge (see Appendix I). The U.S. Geological Survey's Florida Integrated Science Center surveyed amphibians on the refuge as part of their Southeast Amphibian Research and Monitoring Initiative (http://fl.biology.usgs.gov/Amphibians_and_Reptiles/amphibians_and_reptiles.html) in 2005. Biologists from the USFWS Panama City Field Office conducted abnormal amphibian surveillance from 2007 to 2008. Since 1998 the Center for North American Herpetology (<http://cnah.org/>) has conducted annual winter surveys of amphibian and reptile species in December and January. Florida State University is currently conducting monthly frog breeding research through 2015.

Reptiles

There are 42 reptile species documented on the refuge (see Appendix I). These include the American alligator, 14 turtle, 5 lizard, and 22 snake species. Alligator snapping turtle, loggerhead, green, and leatherback sea turtles, ornate diamondback terrapin, chicken turtle, gopher tortoise, eastern indigo snake, and Gulf coast salt marsh snake are noteworthy species. Seasonal marine turtle nesting surveys are conducted annually from 1 May to 31 August as part of Florida's Statewide Nesting Beach Survey program and marine turtle nest productivity data are supplied annually to state wildlife researchers. The refuge also participates in the Sea Turtle Stranding and Salvage Network. Earlier gopher tortoise surveys were conducted in 1999. Seasonal gopher tortoise monitoring was re-initiated in 2010. The Center for North American Herpetology conducted annual winter surveys of amphibian and reptile species in December and January. No other specific monitoring of refuge reptiles is currently underway, although ongoing amphibian surveys may generate some information on reptiles.

Birds

There are 277 bird species (including three exotic species) documented on the refuge; 16 of these are on state or federal imperiled species lists. Eighty-seven bird species have been documented nesting on St. Vincent NWR and 75 bird species are considered common or abundant in at least one season. Annual avian survey and monitoring efforts conducted with partners include the Apalachicola and Port St. Joe Christmas Bird Counts (December), Florida winter shorebird survey (February), the International Piping Plover Census (conducted every fifth winter), Wood Duck nest box monitoring, secretive marshbird monitoring, Snowy Plover breeding survey (April), the Nightjar Survey Network (May or June), Partners in Flight plot surveys (spring), USGS Breeding Bird Survey routes (summer), and the Audubon of Florida shorebird stewardship program. Currently, Coastal Bird Conservation conducts seasonal shorebird and seabird monitoring and state wildlife researchers conduct monthly imperiled shorebird surveys.

Mammals

There are 28 mammal species (including four exotic species) that have been documented on the refuge or in adjacent state waters (see Appendix I). Other than red wolf monitoring and hunt check stations, there are no surveys conducted to monitor refuge mammal population levels.

In 2006 an Eagle Scout constructed and placed four small bat houses on the refuge in consultation with the Florida Bat Conservancy (<http://www.floridabats.org/>). In 2009 with St. Marks Refuge Association funds and in consultation with the Florida Bat Conservancy and Bat Conservation International, a large four post community bat house was constructed and sited by St. Marks and St. Vincent NWR staff and volunteers near the refuge cabin at West Pass. Annual monitoring of bat house activity is conducted by refuge volunteers. Florida Bat Conservancy researchers have conducted some surveys of refuge bat species in conjunction with the ongoing problem of bats roosting in the refuge cabin.

White-tailed deer are currently monitored through data collected at check stations during refuge public hunts and occasionally through herd health checks by the Southeastern Cooperative Wildlife Disease Study (<http://www.vet.uga.edu/scwds/>), which is based in Athens, Georgia. The last health check was conducted in 2003 with future checks planned when data from check stations and/or general observations deem it necessary. In addition, track counts were conducted until 2006. The deer herd currently appears to be below carrying capacity of the habitat.

Exotic Animal Species

There is one exotic fish, common carp, but no documented exotic amphibian or reptile species occurring on the refuge. Rock pigeon, Eurasian collared-dove, and European starling all breed on the refuge but are thought to have minimal impacts on native refuge wildlife.

Coyotes occasionally disperse to the refuge and have the potential to negatively impact the red wolf island propagation program. The U.S. Department of Agriculture (USDA) Wildlife Services provides predator control to remove coyotes observed on the refuge to benefit red wolf recovery. Feral cats have occasionally been documented on St. Vincent Island, especially in the vicinity of the cabin and near Indian Pass. Although free-ranging domestic cats can have devastating impacts on amphibian, reptile, bird, and mammal populations, the impacts of these animals on overall refuge wildlife are considered relatively small on the refuge's island units.

Considered the most destructive exotic animal on the refuge, the feral hog can decimate marine turtle and seabird nests on the beach. Feral hogs may also depredate shorebird and gopher tortoise eggs and young and were possibly the cause for the failure of the 1980 to 1982 eastern indigo snake reintroduction. Hogs prey upon small vertebrates and invertebrates and compete with native wildlife

for mast. By rooting hogs destroy wetland vegetation, including rare species, damage refuge roads and impoundments, and provide favorable conditions for the spread of invasive exotic plants.

The three, annual, refuge public hunts provide some control of the feral hog population, but the hunting pressure is generally too low to be very effective. The USDA Wildlife Services provides some targeted seasonal removal of feral hogs in and near sensitive wildlife habitats, e.g., open Gulf beaches and secondary dunes. Refuge staff also conducts some seasonal feral hog removal to benefit gopher tortoise, marine turtle, and shorebird and seabird conservation and recovery.

In 1908 three sambar deer hinds and one stag were introduced to the then privately owned St. Vincent Island. Sambar deer are native to Southeast Asia but thrived on St. Vincent Island and by 1940 were estimated to number several hundred animals. Although sambar deer are not native to North America, they do not appear to be deleterious to native refuge flora or fauna. The first refuge public sambar deer hunt was a one day primitive weapons hunt held in 1987. The annual sambar deer primitive weapons hunt remains a very popular recreational opportunity and provides some level of population control to this nonindigenous species.

Other species that are considered exotic on the refuge include South American cactus moth (*Cactoblastis cactorium*) and red imported fire ants (*Solenopsis invicta*).

Endangered Species, Threatened Species, and Species of Special Concern

St. Vincent National Wildlife Refuge has 31 documented listed species (10 federal and 21 state listed plant and animal species) plus one candidate species for federal listing. Currently there are no federally listed plant species known from the refuge but West's flax is presently under review. There are four known state listed plant species on the refuge. West's flax is listed as an endangered species by the Florida Department of Agriculture and Consumer Services, while Florida corkwood, Gulfcoast lupine, and Florida beargrass are state listed as threatened.

Sea Turtles. Four of Florida's five sea turtle species have been documented on the refuge and adjoining waters: loggerhead, green, leatherback, and Kemp's Ridley turtles. Loggerhead sea turtles are the most common nesting species, frequently laying over fifty nests per year. Green sea turtles occasionally nest on the refuge beaches, whereas there are only two documented leatherback nests (in 1972 and 2001) and no documented Kemp's Ridley nests. However, northwest Florida beaches have increasingly encountered Kemp's Ridley nesting in recent years.

Gopher Tortoise. Small gopher tortoise colonies are found in secondary dune habitat in areas south of the cabin and Oyster Pond. Gopher tortoises are active from April to October and lay eggs from April to July. Gopher tortoise burrows provide refugia for multiple declining wildlife species including the eastern indigo snake and the eastern diamondback rattlesnake. Gopher tortoises benefit from warm (growing) season fires which stimulate herbaceous plant growth and maintain open habitat. Exotic animals such as armadillos and wild pigs may consume gopher tortoise eggs and/or young and degrade habitat.

Eastern Indigo Snake. The eastern indigo snake is the largest non-venomous snake in North America. It formerly occurred throughout much of Georgia, Alabama, and Florida. Eastern indigo snakes utilize gopher tortoise burrows and stump holes for winter refugia. From 1980 to 1982 a reintroduction of, primarily juvenile, eastern indigo snakes was attempted on St. Vincent NWR. This effort initially appeared to have succeeded, but was ultimately unsuccessful, probably due to wild pig (feral hog) depredation. St. Vincent NWR may be a good candidate for reintroduction of genetically suitable animals provided there is continued implementation of the approved animal control plan and refuge prescribed fire program.

Wood Stork. No known wood stork nesting sites are located on the refuge. Isolated ponds, coastal marshes, and shallow water areas in the impoundments provide important feeding habitat for this species on the refuge, particularly during the summer and fall months. Wetlands around Mallard Slough Marsh and Dry Bar provide foraging and roosting habitat during the warmer months. Seasonal drawdowns of Lakes 1 to 3 could provide foraging habitat for post breeding storks.

Bald Eagle. On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. The bald eagle continues to be protected under the federal Bald and Golden Eagle Protection Act; the Migratory Bird Treaty Act; and, in Florida, the state's bald eagle rule (section 68A-16.002, Florida Administrative Code). St Vincent Island supports seven to nine bald eagle nesting pairs each winter. Paired birds have high site fidelity and generally return each fall to breed in the same territory, often in the same nest or a nearby alternate nest location. These locations are documented and monitored annually during nesting season as resources are available, and are protected from ground disturbance by seasonal refuge road closures, seasonal October–May closures around bald eagle nesting territories, and prescribed fire/smoke management planning. Land Management practices within 600 feet of bald eagle nests are conducted in a manner consistent with the guidelines provided in the Florida Fish and Wildlife Conservation Commission's Bald Eagle Management Plan (see <http://myfwc.com/wildlifehabitats/managed/jbaldeagle/>).

Snowy Plover. This small, year-round resident shorebird breeds annually on the refuge from February to August on dry sand and shell beaches along the Gulf of Mexico and on Tahiti Beach. The highest density snowy plover breeding areas are the Gulf beaches at Indian Pass and around the outfall creek from Oyster Pond. Snowy plover is vulnerable to disturbance from human recreation, pets, and from vehicles, particularly during the breeding season. Seasonal closed areas are marked on the Gulf beaches at Indian Pass and Oyster Pond to direct pedestrian and vehicular traffic through and away from critical shorebird and seabird nesting habitats. Snowy plover productivity is highest in the two areas with symbolic fencing constructed by the National Audubon Society's Coastal Bird Conservation Program in 2008.

Red Knot. The red knot is a migratory shorebird that breeds in northern Canada and Alaska. This sandpiper migrates tremendous distances annually and winters in Florida, Brazil, and the southern tip of South America. Red knots are found on the refuge in small numbers in every month and may number several hundred in winter and spring. They roost and forage for intertidal invertebrates along the entirety of the refuge's Gulf of Mexico and Apalachicola Bay shorelines. The largest concentrations of red knots on the refuge are typically located around the Oyster Pond Creek outfall to the Gulf and along the Gulf, Sound, and Bay shorelines near Indian and West Passes.

Piping Plover. This small migratory shorebird breeds in northern tier states and in Canada in three distinct breeding populations: the Great Lakes (endangered population), rivers and lakes in the American and Canadian plains, and the Atlantic coast. At St. Vincent NWR, it forages and roosts along the Gulf of Mexico, Apalachicola Bay, and St. Vincent Sound shorelines, tidal creeks, and flats in the nonbreeding months. Individuals banded on breeding grounds in the Great Lakes and the American plains and have been documented on St. Vincent NWR at Indian Pass and at Oyster Pond. The piping plover is sensitive to disturbance from humans, pets, and vehicles. The Service designated critical habitat in 2001 for wintering piping plover at Indian and West Passes and St. Vincent Point (including the entrance to Sheepshead Bayou).

Red Wolf. Once common throughout the southeastern United States, red wolf populations were decimated by the 1960s due to intensive predator control programs and loss of forested habitat. After being declared an endangered species in 1973, a recovery plan was completed and efforts were initiated to locate and capture as many wild red wolves as possible. A remnant population of red

wolves was found along the Gulf coast of Texas and Louisiana and of the 17 remaining wolves captured by biologists, 14 became the founders of a successful captive breeding program. The species was subsequently declared extinct in the wild. In 1987 a restoration program began at Alligator River NWR in northeastern North Carolina with the release of four red wolf pairs. In 1990, St. Vincent NWR became an island propagation site for the red wolf recovery program. Today, 100 to 120 red wolves roam in the wild in North Carolina, the world's only wild red wolf population. Approximately 180 red wolves remain in 40 captive facilities, and there is one breeding pair on St. Vincent Island. The role of St. Vincent NWR is to facilitate the propagation of "semi-wild" red wolf pups for reintroduction to the mainland population in North Carolina. Red wolf pups born in April and May gain approximately 18 months of "semi-wild" experience on the island before they are transferred to North Carolina to augment the wild population.

Florida Manatee. Occasional Florida manatee sightings are reported in the warm water months principally from May to October. Manatees have been noted most often around the refuge boathouse and the barge slip at Indian Pass. These slow moving mammals are susceptible to boat strikes. The refuge cooperates with local and state law enforcement and wildlife agencies in educating the public and by promptly reporting injured or dead manatees to the Marine Mammal Stranding Network.

Gulf Sturgeon. The Gulf sturgeon is an ancient fish dating back 200 million years. The Gulf sturgeon is long-lived, living up to 40 years and attaining lengths of up to 9 feet. The fish inhabit the coastal rivers, bays, and nearshore waters of the Gulf of Mexico from eastern Louisiana to western Florida. Gulf sturgeon are anadromous, entering the Gulf of Mexico coastal rivers in the spring to spawn and remaining throughout the summer and emigrating into marine water in the fall. Sub-adults and adults do not feed until emigration into the estuaries, bays, and marine waters, where feeding occurs throughout the winter.

CULTURAL RESOURCES

Very few systematic archaeological and historical investigations have been conducted on St. Vincent NWR. Since its establishment in 1968, most of the archaeological investigations and historic building assessments have been conducted primarily to ensure compliance with Section 106 of the National Historic Preservation Act (Miller et al. 1981, Kanaski 2007). Exceptions include site condition assessments conducted by the National Park Service's Southeast Archaeological Center in May 2010 as part of the initial response following the Deepwater Horizon oil spill, White's (2009) archaeological survey and testing of precolumbian sites along the island's northern shore (White and Kimble, in prep.), and geoarchaeological investigations to ascertain the barrier island's formation and sea level curves (Stapor and Tanner 1977, Dongahue and White 1995, Walker et al. 1995). A site monitoring program using volunteers and the refuge's Friends Group was created as part of White's (2009) investigations.

At present, 25 historic properties have been recorded on the refuge. Twenty of these historic properties are precolumbian archaeological sites located along the barrier island's northern shore. The majority of these sites are eroding oyster shell middens occupied from the Late Archaic [Norwood] through Fort Walton periods (ca. 2000 B. C. E. to 1630 C.E.). The three remaining historic properties are associated with mid-19th and early 20th century occupations on the island.

Fort Mallory is an earthworks or sand fort built by the Confederates in late 1861 to protect the West Pass. The fort, which had at least six gun emplacements, a barracks, and other buildings, housed an estimated 175 troops from August to December 1861. Union forces found the fort deserted by mid-December 1861 and reportedly destroyed it by January 18, 1862. Miller et al. (1981) described the site as "an indistinct earthwork among the dune ridges and swales on the southeast corner of the

island...only two “walls” could be identified...and consist of low, straight sandbanks with a recognizable outside edge.” Though the island was never occupied by Union troops, cattle, sheep, goats, hogs, and fowl provided a major source of food for the Apalachicolans during the Union Navy’s blockade. The livestock were owned by Robert J. Floyd, who had resided on the island from 1858 to 1860.

On the southeast corner of the island overlooking West Pass is the early 20th century Pierce Complex. Within the site are the grave of George Hatch, the Pierce Cabin, and a small boathouse. Hatch, a former banker and mayor of Cincinnati, Ohio, purchased the island in 1868. At the time of his death in 1875, his estate was described as a house on St. Vincent, a residence in Apalachicola, a yacht, 400 wild and 40 tame cattle on the island, 300 books, and property in Ohio. Dr. R. V. Pierce, founder and owner of Pierce’s Proprieties, Inc., and the Invalids’ Surgical Institute, acquired the island in 1907. He built three interconnected bungalows, a three-room cottage, a Superintendent’s Bungalow, a Game-Keeper’s cottage, two hunting lodges, and a number of outbuildings. His family used the island primarily as a country estate or home and a wildlife preserve. Dr. Pierce introduced the nonnative sambar deer in 1908. Pierce ran approximately 100 head of “blooded cattle” and a small number of horses on the Island. The Loomises (1948 to 1968) introduced black buck, zebra, eland, ring-necked pheasant, turkey, Asian jungle fowl, and bobwhite quail. Both Pierce and the Loomises actively managed the island to promote habitat suitable for the introduced nonnative animals, but also for migratory waterfowl (canvasback, mallard, pintail, blue-bill, and Canada geese), shore birds, oyster, and fish (black bass, mullet, bream, perch, red snapper, tarpon, and grouper). Pierce planted wild rice, wild celery, smartweed, potamogeton, and cowpea to improve foraging for the migratory waterfowl. The Loomis brothers added a number of unimproved roads to enhance motorized travel across the island, as well as to serve as firebreaks.

The Service acquired the island for the establishment of a national wildlife refuge in 1968. Shortly after its creation, most of the Pierce-era buildings were demolished. The Pierce Cabin, which currently serves as temporary quarters for refuge staff and scientific researchers, is one of the two surviving features from this time period; the other being a small boathouse. The Service rehabilitated the cabin in 2009.

Examining of the island’s title chain raises the potential for additional historic period sites (Table 1). In 1839, federal surveyors referenced a “warf of fishermans house” near Paradise Point and St. Vincent Point. A 10-acre lot near the east end of the Island and reserved by the United States for a lighthouse is mentioned in several deeds. Congress appropriated funds for its construction in 1854, but it is unclear whether it was actually built. Two range beacon lights were erected on or near the southeast shore in 1901. Shortly after the start of World War II, the Pierce Estate leased mineral and oyster leases to a variety of companies. Loggers cut stands of virgin pine, which were hauled to the mainland on a temporary bridge known as the Kenny Mill Bridge. Remnants of the bridge are still present at the 14 Mile site. Private sportsmen leased hunting rights in the late 1940s. The Loomis Brothers, who purchased the island in 1948, re-established the wildlife preserve and earlier land use practices present during the early years of the Pierce family ownership.

The potential for additional precolumbian archaeological sites remains unknown on barrier beach ridges seen in the island’s interior. Limited testing by White (2009) on several of these relict interior ridges did not yield any evidence of precolumbian occupation. She recorded a large Fort Walton shell midden on Big Bayou. Other sites may be present along Big Bayou, but this possibility remains an unknown until a systematic archaeological survey is performed.

SOCIOECONOMIC ENVIRONMENT

According to the U.S. Census Bureau, Franklin and Gulf Counties, which support refuge lands, are sparsely settled and economically depressed when compared to the state as well as the nation (Table 6). Franklin County, encompassing 348,800 acres (534.7 square miles) has one of the lowest populations in the state (64 out of 67 counties) with an estimated 11,549 people in 2010.

Approximately 70 percent of Franklin County is currently owned by the state or federal government. Gulf County also has a low population of people which supports 0.1 percent of Florida's population. Both counties are below the statewide and national averages for median household income as well as per capita income. The percent of individuals over the age of 25 with a high school degree in both counties is slightly below the state average (79 percent compared to 85 percent), with the percent with college degrees also below the state average (19 percent compared to 26 percent).

Over the last 50 years the population of both counties has had a slow upward trend with a majority Caucasian influence. The upward trend is expected to continue for the next 20 years increasing the population of both counties by 2,000 per county (Table 7).

Table 5. Socioeconomic profile

Characteristic	Franklin County	Gulf County	Florida	USA
2010 Population (number)	11,549	15,863	18,801,310	308,745,538
Population Density (pop./square mile)	22	28	351	87.4
2010 Total Land Area in square miles	535	564	53,624	3,531,905
Race/Ethnicity (2010 percent of Population) (Total can be greater than 100% because Hispanic can be counted in other races)				
Caucasian	82.6	78.1	75.0	72.4
African American	13.8	18.7	16.0	12.6
Hispanic or Latino	4.6	3.8	22.5	16.3
Native American	0.5	0.4	0.4	0.9
Asian	0.2	.3	2.4	4.8
Native Hawaiian and Other Pacific Islander	0.1	0.0	0.1	0.2

Characteristic	Franklin County	Gulf County	Florida	USA
Two or more races	1.7	1.8	2.5	2.9
Education (2000 Census)				
% Pop. Over 25 w/high school degree	79.8	77.7	85.3	85.0
% Pop. Over 25 w/college degree	19.3	13.6	25.6	27.9
Income				
2009 Median Household Income (\$)	\$33,956	\$39,178	\$44,755	\$51,914
2009 Per Capita Income (\$)	\$22,924	\$17,968	\$26,503	\$27,334
2009 persons below poverty	23.1%	19.5%	15.0%	13.8%

(U.S. Census Bureau: State and County QuickFacts, 2010).

Table 6. Population trends from 1970-2030

Population Trends		
Year	Franklin County	Gulf County
1970	7,065	10,096
1990	8,967	11,504
2010	12,432	16,841
2030	14,431	18,896

(Florida Legislature, Office of Economic and Demographic Research. 2009).

Historically, the economy of the local area has been based on the seafood industry, tourism, timber, turpentine, and some manufacturing. The St. Joe Company, owning significant acreage in both counties, has guided change in both counties from creating new developments, promoting tourism, and creating new businesses. In recent years, Gulf County has undergone serious changes with the closing of the St. Joe Paper Mill and most recently, the Arizona Chemical Plant. In 2005, Franklin County became the site for a new state prison facility, providing additional jobs to the county; however, in 2012 it will be closed. As of 2009, government operations supported the highest percent of jobs in both counties well above the statewide percentage (Table 8). St. George Island, Apalachicola, Indian Pass, and Cape Sand Blas communities support tourism, and vacation rental businesses providing many jobs opportunities throughout the counties. Apalachicola Bay produces 90 percent of Florida's oyster crop and 10 percent of the nation's oyster harvest continuing to provide jobs for the community. (BSL 1992).

Table 7. Employment by industry

2009 Employment by Industry (Percent)	Franklin County	Gulf County	Florida
Natural Resource and Mining	NA	1.1	1.2
Construction	4.5	8.5	6.7
Manufacturing	3.6	3.5	4.8
Trade, Transportation, and Utilities	16.5	14.7	20.5
Information	0.8	NA	2.0
Financial Activities	9.9	7.3	6.8
Professional & Business Services	3.8	5.2	14.9
Education and Health Services	4.3	9.8	13.2
Leisure and Hospitality	21.6	9.7	12.3
Other Services	2.5	1.5	3.3
Government	31.8	36.7	14.1

(Florida Legislature, Office of Economic and Demographic Research. 2009. (<http://EDR.state.fl.us>>))

The 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation shows that 87.5 million U.S. residents 16 years and older participated in wildlife-dependent recreation with a 6 percent increase in the number of wildlife-watching participants since 2001. The State of Florida played a key role in the 2006 survey statistics, showing an increase of 20 percent in total state resident participants in wildlife-dependent recreation inside and outside Florida when compared to the survey of 2001. However, over the 5-year survey period the nation lost 3.9 million participants in angler and hunter activities, but wildlife watching participants increased by 5 million. The overall total national wildlife-dependent recreation expenditures increased from \$108 billion in 2001 to \$122.3 billion in 2006, wildlife-watching expenditures increased by \$7.3 billion, and sportspersons' expenditures increased by \$6.7 billion in these 5 years.

Wildlife viewing has emerged as an important economic value to the State of Florida, generating an estimated \$3.1 billion in Florida. Wildlife watchers in Florida over a 5-year period (2001 to 2006) have increased by 1 million; however, there has been a decrease of 0.4 million sportspersons. Statewide, birding and associated activities are attracting a substantial dollar amount for Florida. The FWC also developed the Great Florida Birding and Wildlife Trail, a 2,000-mile trail that links bird watching sites in Florida. St. Vincent NWR is part of the panhandle section of the trail.

REFUGE ADMINISTRATION AND MANAGEMENT

LAND PROTECTION AND CONSERVATION

Minor Expansion Proposal (11 Mile)

A minor expansion proposal was approved for St. Vincent NWR in 2010. This expansion includes approximately 1,247 acres that form a narrow strip of coastal wetlands and uplands. This includes sensitive habitats along St. Vincent Sound and contributes to national and ecosystem goals through the restoration and management of habitat for migratory birds, neotropical migratory songbirds, species of management concern, and the recovery of threatened and endangered species. Acquisitions in this boundary would create connectivity between the refuge units, as well as connect the refuge with nearby state-managed lands of the St. Joe Bay State Buffer Preserve. The St. Vincent Island unit of St. Vincent NWR is only accessible by boat.

VISITOR SERVICES

Visitor Orientation

St. Vincent NWR has an office/visitor center located in Apalachicola, where visitors may pick up literature and ask refuge staff questions. There are highway directional signs to the office and to the boat landing at Indian Pass. Figure 12 depicts where the facilities are located on the refuge.

Hunting

Hunting permits are limited and are handled through the FWC for a small fee. Hunters are allowed to primitive camp on the island and only muzzleloading guns or archery equipment is permitted.

Fishing

St. Vincent NWR has a series of five interior brackish/freshwater lakes with varying seasons for fishing. Access with small jon/kayak style boats works the best. Maintaining the freshwater fishery is a constant challenge due to saltwater intrusion from high tides and storms.

Wildlife Observation/Photography

There are a number of sand roads that are open to foot and bicycle traffic; however, there are few trail signs, road signs or directional signs, so visitors are on their own exploring the island. Access to the primitive beaches, dense stands of cabbage palmettos, wild vistas over marshes, and Bay waters provide excellent wildlife viewing and photography for visitors.

Environmental Education

Limited staff time has restricted opportunities for environmental education. St. Marks NWR's environmental education specialist is working to create curriculum, contact educational organizations, and train volunteers to enhance this important program.

Interpretation

Information is currently provided at the office/visitor center, the annual Open House and other special events, the website, and at several kiosks at boat landings, 14 Mile, and on the island. Key resource issues for interpretation are: Sea turtles, red wolves, the importance of St. Vincent Island to the estuary system, migratory birds, the Refuge System, the history of the island, and the importance of fire in the ecosystem.

Volunteer program

Local and recreational vehicle camper volunteers assist with running the visitor center, monthly tours, special events, sea turtle nesting project, and red wolf tracking project. Of concern is the lack of one person handling all volunteer projects, so tracking volunteer activities and ensuring safety and direction of the program have been difficult.

Friends group

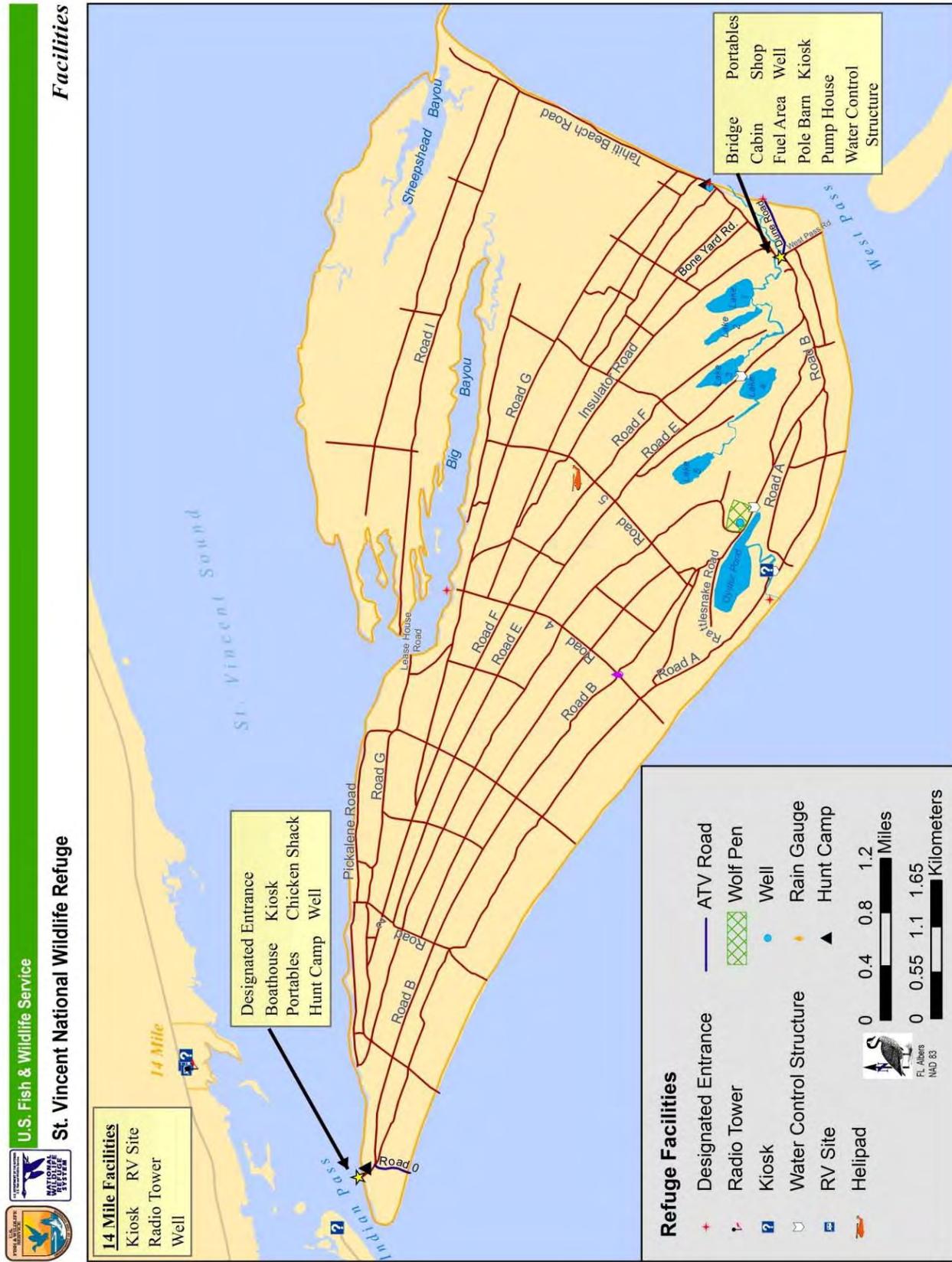
The Supporters of St. Vincent NWR, Inc., formed in 2006 and has roughly 150 members, with 60 to 70 percent from out-of-state. The focus of the Friends group is education and how to promote awareness of the refuge and refuge management to the public.

PERSONNEL, OPERATIONS, AND MAINTENANCE

St. Vincent NWR is administered as an independent refuge and part of a complex which is headquartered in St. Marks's, Florida, as part of the North Florida NWR Complex. The headquarters is approximately 75 miles to the east (about 1 hour and 45 minutes). The refuge has a good base of facilities and equipment to support management operations on site. The staff is responsible for maintaining over 219 assets including buildings, roads, parking lots, foot trails, interior lakes, water control structures, a bridge, and a fleet of heavy equipment, passenger vehicles, and small equipment. The refuge has 4 full-time employees.

The annual budget of St. Vincent NWR varies. In FY08 and FY09, basic refuge funding for St. Vincent NWR was \$223,440 and \$211,640, respectively. This does not include the fire program (\$55,300 and \$57,200 - FY08 and FY09 respectively, which is one staff member's annual pay) or deferred maintenance projects. Salary and benefits accounted for 87 percent of the base budget, leaving 13 percent or \$35,457 of the base funding for operations.

Figure 12. Facilities map



As of January 2012, St. Vincent NWR staff comprised the following:

Refuge Manager GS-0485-12
Office Assistant GS-0303-07
Biological Technician GS-0404-7
Forestry Technician GS-0462-06

No new positions are expected within the next five years. The staff at St Vincent NWR is currently challenged due to work force planning when the staff was reduced from seven staff members to four staff members. The staff will be challenged to provide effective administrative, management, and monitoring oversight.

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. The team also directed the process of obtaining public input through public scoping meetings, open planning team meetings, and personal contacts. Two public scoping meetings were held in July 2009, one at the St. Joe Bay State Buffer Preserve in Gulf County, Florida, and a second at the Apalachicola Community Building in Franklin County, Florida. The Gulf County meeting had 28 in attendance and six Service personnel. Sixteen citizens attended the Franklin County meeting, along with six Service personnel. Throughout the commenting period the refuge received 30 responses. 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 significant to the refuge. A summary of the significant issues follows.

- Control invasive exotic species (especially hogs) combined with education
- Need for more education, outreach, and awareness of the refuge
- Need to evaluate the appropriate size and staff needed to accomplish established purposes (i.e., consider biologist and federal wildlife officer positions)
- Need to broaden and strengthen relationships and partnerships internally and externally
- Need to better understand the potential impacts of climate change on refuge resources
- Evaluate limited accessibility issues
- Acquire additional funding to support refuge needs

The additional issues for the refuge to address during the 15-year life of the CCP are divided into five categories: fish and wildlife population management, habitat management, resource protection, visitor services, and refuge administration. They are summarized in the following sections.

PRIORITY RESOURCE ISSUES

FISH AND WILDLIFE POPULATION MANAGEMENT

Threatened and Endangered Species

The protection of threatened and endangered species is an important responsibility delegated to the Service and its national wildlife refuges. A number of federally listed threatened and endangered species use St. Vincent NWR. These include red wolf, sea turtles (loggerhead, leatherback, green, Kemp's Ridley), eastern indigo snake, wood stork, piping plover, Florida manatee, and Gulf sturgeon.

Migratory Birds

The primary purpose of the refuge is to provide resting, nesting, feeding, and wintering habitat for waterfowl and other migratory birds. Providing habitat (i.e., hardwood forest, pine forest, brackish marshes, and open water) for these birds is essential to fulfilling the purpose of the refuge. The operation and management of the refuge provides for the basic needs of these species, including feeding, resting, and breeding. Current management tools include prescribed burning and water level

management. Comments from the biological review team and the public expressed a desire to support and expand these efforts.

Resident Wildlife

While the Service's primary goal is the protection of federal trust species, the refuge also strives to improve natural diversity of resident fish and wildlife species. Therefore, it is the responsibility of the refuge to manage resident wildlife within the refuge boundaries. This management should be performed in conjunction with, and not to the detriment of, songbirds, shorebirds, and wading birds within the refuge. The most widely recognized species include white-tailed deer, raccoon, American alligator, and various snakes, frogs, and turtles.

HABITAT MANAGEMENT

Fire Management

As land-use patterns change and residential/commercial development intensifies near the refuge, consideration for both prescribed fire and wildfire management becomes a greater concern. It is more likely that smoke from prescribed fires will affect populated areas and wildfire starts threaten homes. Aesthetic quality and smoke exposure for local and visitors will become more of an issue. The benefit of prescribed fire is substantial in that it reduces fuel loads and lessens wildfires threats.

Water Level Management

There are currently six (Oyster Pond, and Lakes 1 to 5) impoundments on St. Vincent Island. Three of the impoundments (Lakes 1 to 3) are managed for slightly brackish to intermediate systems with draw downs that are beneficial to shorebirds and wading birds. Two of the impoundments (Lakes 4 to 5) are managed for fresh, deep-water conditions that support freshwater fish species. The Oyster Pond is managed naturally depending on weather with no set salinity levels. The management of these impoundments is closely tied to weather events and can be a challenge to manage with lack of staff in a primitive environment.

Forest Management

The timber on St. Vincent Island was harvested first in the 1940s and then again in the 1960s under private ownership. As a result of past timber harvesting, a majority of the island is an even-aged stand of slash pine. The timber stand should be evaluated for health and density to determine if future desired conditions are possible with current management.

RESOURCE PROTECTION

Exotic and Invasive Species Control

An "invasive species" is defined as one that is nonnative (or alien) to the ecosystem under consideration and whose interdiction causes or is likely to cause economic harm, environmental harm, or harm to human health (Executive Order 13112). These species are normally introduced by direct or inadvertent human actions.

Invasive species of both flora and fauna currently occur on the refuge. The primary animal species of concern is the feral hog. The most prolific invasive plant is the Chinese tallow tree. Management of tallow has been by physical, herbicidal, and prescribed fire activities. Continued monitoring is needed to evaluate the current invasive species populations as well as detect new invasive species.

Acquisition Boundary

A refuge acquisition boundary is an administrative line delineating areas in which the Service may consider negotiations for inclusion of those areas within the management of the particular national wildlife refuge in question. The Service's policy is to acquire property or interests in property only from willing sellers. Lands within a refuge acquisition boundary do not become part of the refuge unless and until a legal interest is acquired (e.g., through a management agreement, easement, lease, donation, or purchase). Properties within an acquisition boundary are not subject to any refuge regulations or jurisdiction unless and until an interest is acquired.

Land Acquisition

Acquiring ecologically important lands is one of the most effective ways in which to protect vulnerable habitat and associated wildlife species. The refuge is located in an area where obtaining land from willing sellers is still a viable option, as most neighboring lands are largely undeveloped.

Cultural Resources

The refuge lies within a culturally rich environment. The refuge is known to have oyster shell middens, historical structures and a marked grave. There have been limited archaeological investigations within the refuge. The staff must conduct all management activities in a manner that avoids compromising sensitive sites.

VISITOR SERVICES

General Use

Identified in the Improvement Act are six priority public uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) allowable on refuges, as long as appropriate and compatible with a specific refuge's purpose(s). St. Vincent NWR supports the six priority public uses on parts of the refuge in a primitive state. During public scoping, there were mixed opinions on public access opportunities. The impacts of visitor use on wildlife, plants, and habitats and the human carrying capacity on the refuge have not been assessed. These impacts should be evaluated and appropriate measures developed and implemented to minimize adverse impacts and provide direction for the amount of public access.

Fishing and Hunting

Fishing and hunting opportunities are of great public interest on St. Vincent Island. The refuge supports three managed hunts (white-tailed deer archery, white-tailed deer primitive, and sambar deer primitive). The refuge intends to maintain a quality, safe hunting opportunity.

The refuge provides diverse salt and freshwater habitats. These habitats serve as nursery areas as well as breeding and feeding grounds for shrimp, red drum, speckled sea trout, mullet, blue crabs, bluegill, largemouth bass, and other marine and aquatic organisms. Over the last several years on St. Vincent Island, saltwater fishing opportunities have been readily available; however, freshwater fishing opportunities have been limited. It is desired with the initiation of a 2008 freshwater fish stocking event the refuge will have a better freshwater fishing opportunity.

Wildlife Observation and Photography/Environmental Education and Interpretation

The refuge currently offers limited primitive wildlife observation, photography, environmental education and interpretation. During the past several years, environmental education and interpretation programs presented by refuge staff have declined due to lack of staff. The need to provide more public awareness, outreach opportunities, and environmental educational programs was noted from public scoping comments.

REFUGE ADMINISTRATION

Administrative Resources

Important issues related to refuge administration involve staffing, funding, and intergovernmental coordination. The lack of sufficient staffing and funding to address management concerns continues to be an important issue for the refuge. Given the complexity of management on the refuge and the need for the involvement of multiple partners in developing and implementing solutions, intergovernmental coordination was identified as one of the priority issues to be addressed in the CCP.

Law Enforcement

The refuge provides a generally safe primitive experience to the visiting public during daylight hours. However, over the last several years daily law enforcement patrol has decreased with loss of staff positions. The accelerating population growth of the surrounding area is likely to result in an increase of inappropriate and illegal activities on the refuge. The refuge's island areas are relatively remote and difficult to patrol. Increased law enforcement patrols are needed to protect and maintain the refuge's resources.

Partnerships

Developing partnerships with nearby universities and other government agencies is critical for assessing and monitoring resources and for evaluating land and wildlife management techniques over time. Refuge personnel should enhance partnerships with adjacent landowners and nearby government agencies to achieve goals and improve land management.

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. The Service has identified six priority wildlife-dependent public uses. These uses are: Hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

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

Three alternatives for managing the refuge were considered: Alternative A - Continue current management (No Action); Alternative B - Emphasize natural and primitive processes; and Alternative C - Expand resource management for native and imperiled species. Each of these alternatives is described in the Alternatives' section of the EA. The Service chose Alternative C as the proposed management direction.

Implementing the proposed alternative would result in increased fish and wildlife inventorying and monitoring to detect changes in species and habitats and to gain knowledge about species not surveyed in the past. A focus would be on gaining a better understanding of imperiled species and their habitat needs. With the additional knowledge, the refuge could better adapt to the changing environment to support the needs of the wildlife, fish, and plants. The refuge would also aggressively attempt to eradicate feral hogs from St. Vincent Island to reduce the habitat deterioration caused by feral hogs and to decrease loss of threatened and endangered species. The refuge would continue to support the six priority wildlife-dependent recreational uses and strive to enhance each of the programs. Also, partners would play a key role in assisting with meeting the goals of the refuge.

The Draft CCP/EA is ambitious with respect to available funding and our corresponding ability to execute the identified actions. Due to economic conditions, the Service is anticipating reductions, or at best, static budgets for the next few years. However this Draft CCP/EA would cover a 15-year span and budgets may improve during that period. To clarify what we expect to do under the current conditions versus actions in a better budget climate, strategies in the plan would identify two tiers - tier 1 would contain actions that would be done if our funding is static, and tier 2 would include those things that would be done only with added funding.

VISION

St. Vincent National Wildlife Refuge will be a prime example of a large, undeveloped barrier island with nearby coastal habitats which provide a unique natural diversity of plant and animal communities and buffers the important estuarine resources of Apalachicola Bay. Through partnerships, the refuge will link coastal ecosystems with a network of wildlands for the conservation of threatened and endangered species, migratory birds, and resident fish and wildlife for the benefit of future generations. The refuge will provide compatible, primitive, outdoor recreation and environmental

education opportunities, so that the public will understand and appreciate the importance of conserving its natural and cultural resources.

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 and are presented in hierarchical format. 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 St. Vincent NWR. The Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

FISH AND WILDLIFE POPULATION MANAGEMENT

Goal 1. Fish and Wildlife Population Management - Protect, maintain, enhance, and restore healthy and viable populations of migratory birds, resident wildlife, and fish.

Discussion: St. Vincent NWR is home to a large variety of resident fish and wildlife species and provides resting, nesting, and foraging habitat for many migratory species. Currently, the refuge has documented 277 bird species, 40 fish species, 42 reptile species, 11 amphibian species, and 28 mammal species that have used the refuge.

Objective 1.1: Migratory and Resident Bird Inventory and Monitor - Over the next 15 years, expand current surveying and monitoring studies of migratory birds to better understand species populations (trends and patterns) and habitat needs as related to the refuge and geographic population range of the species of land birds, including raptors, shorebirds, wading birds, marsh birds, and waterfowl, to support and conform to the Refuge System's inventorying and monitoring plan.

Discussion: The refuge conducts some surveys to gain knowledge of various bird species; however, with the changing environment additional surveys are needed. The key to the conservation and restoration of these species' populations is increased knowledge through inventorying and monitoring that can be used to direct adaptive management of critical habitats.

Strategies:

Tier 1:

- With support of refuge volunteers, continue to annually conduct Christmas Bird Counts, Breeding Bird Surveys, and point counts.
- Monitor and document annual activity of known wading bird rookeries.
- Seasonally monitor shorebird nesting activities along St. Vincent Island Beach and Tahiti Beach.
- Annually ground monitor active bald eagle nests and record any new nests.
- Coordinate with partners to perform surveys and research studies.
- Document and report notable die-offs (greater than five birds).

Tier 2:

- Increase point counts to have a minimum of 10 points per priority habitat type.
- Participate in the International Shorebird Survey program.
- Annually partner with FWC to conduct aerial bald eagle surveys and record any new nests.

-
- Initiate quarterly bird surveys of Pig Island.
 - Expand research studies to gain a better understanding of seaside sparrow and fire relationship in the marsh.
 - Explore opportunities with the Service's flyway biologist to conduct mid-winter aerial waterfowl surveys.
 - Establish ground and boat waterfowl survey routes to assess numbers/species composition in high use areas (Lakes 1,2,3,4 and Oyster Pond; Mallard Slough; Big Bayou; Sheepshead Bayou; and major seagrass/SAV areas in the nearby Sound).
 - Conduct monthly waterfowl survey routes during November – March.
 - Partner with FWC to support wood duck banding quotas for state (1,050) off refuge when funding is available.
 - Evaluate the potential to reintroduce eastern wild turkey.

Objective 1.2: Migratory and Resident Bird Protection - Over the next 15 years, promote increased productivity of migratory and resident bird species by avoiding unnecessary disturbance while providing increased nesting opportunities.

Discussion: The main purpose for establishing the refuge is for the benefit of migratory birds. The key concern for the refuge is to provide suitable habitat for migratory birds, as well as resident birds, to meet their needs.

Strategies:

Tier 1:

- Seasonally protect sensitive shorebird nest sites from human disturbance with public outreach, signs, and symbolic fencing along the beach.
- Close and monitor Tahiti Beach during least tern nesting season.
- Protect various wading bird rookeries from human disturbance.
- Ensure that bald eagle nesting areas are protected from disturbance by posting and closure of areas around the nest during the nesting season.
- Annually maintain and monitor 40 wood duck boxes on St. Vincent Island.

Tier 2:

- Provide predator control in and around bird nesting sites.
- Regularly monitor and remove ladder fuels around active bald eagle nests during the non-breeding season through the use of fire, mowing, or hand trimming to protect the nest tree from unwanted fire or root damage.
- Install two barn owl nest boxes at St. Vincent Island boathouse.
- Evaluate wood duck population and production trends.
- Coordinate with partners to perform research studies.

Objective 1.3: Native Mammals - Throughout the life of the CCP, maintain a healthy, balanced population of native mammals to prevent overpopulation, reduce disease, and prevent habitat destruction on refuge lands by using human manipulations.

Discussion: Big game mammals on St. Vincent Island have been inventoried and populations controlled for many years through a public hunt program. The refuge would continue to keep the population of these species in check; however, there are other mammals that are poorly understood and not as well researched. Additional work is needed to gain a better understanding of these other mammals and the role they play in the ecosystem.

Strategies:

Tier 1:

- Collect deer data through hunter check stations during managed hunts.
- Report marine strandings on the refuge.
- Coordinate with partners to perform research studies.

Tier 2:

- Conduct baseline mammal surveys and compare to past surveys.
- Conduct a systematic evaluation of small mammal communities on St. Vincent NWR.
- Continue to work with the Florida Bat Conservancy to survey and identify bat species throughout refuge.
- Evaluate the use of the current artificial bat roost sites and investigate the need for additional artificial bat roost sites.
- Perform white-tailed deer herd health checks with Southeastern Cooperative Wildlife Disease Study (SCWDS) when any sign of disease or overpopulation is observed.
- Install several deer grazing enclosure sites throughout habitat types to help gauge herd densities and impacts to refuge vegetative communities.
- Maintain current deer hunting program until biological data justifies modification.

Objective 1.4: Fish - Maintain a healthy variety of saltwater and freshwater fish in the various lakes (Lakes 1, 2, and 3 saltwater species and Lakes 4 and 5 freshwater species) on St. Vincent Island, over the next 15 years.

Discussion: The freshwater sport fishery (bluegill, redear sunfish, and largemouth bass) on St. Vincent Island has fluctuated widely throughout management history. Marine sportfish (spotted sea trout, red drum, forage species, Atlantic menhaden, and Atlantic croaker) are found in the more saline lakes on the refuge. Spotted gar, gizzard shad, golden shiner, and striped mullet occupy both freshwater and saltwater habitats. The "Hand Paint Bluegill," a unique color variation of the bluegill, is found in the Apalachicola River watershed and in freshwater habitats on St. Vincent Island.

Strategies:

Tier 1:

- Restock as needed to maintain quality fisheries in Lakes 4 and 5 with bass and bluegill.
- Update fish management plan by 2014 in coordination with FWC.

Tier 2:

- Annually survey and monitor Lakes 1 to 5 and Oyster Pond to detect changes in fish populations while maintaining a database.
- Conduct a contaminant study in the lakes to determine quality of fish health.
- Evaluate stocking native brackish species such as redfish to provide additional sportfishing opportunities in impoundments not managed as freshwater habitats.

Objective 1.5: Reptiles and Amphibians - With partnership support, continue to gain knowledge (species presence and absence, population trends and patterns) through inventorying and monitoring reptile and amphibian species on the refuge over the next 15 years.

Discussion: The reptile and amphibian populations on the refuge are not fully understood. A partnership with the Center for North American Herpetology has helped the refuge gain a better understanding of the herptile community. However, additional knowledge is needed to manage for these species.

Strategies:

Tier 2:

- Evaluate and monitor the eastern diamondback rattlesnake population on St. Vincent Island.
- Work with universities to gain a better understanding of reptiles and amphibians and their needs on St. Vincent Island.

Objective 1.6: Invertebrates - Over the next 15 years, with partnership support, conduct inventorying and monitoring to gain knowledge of invertebrates throughout the refuge.

Discussion: There is little knowledge of invertebrate species and their needs as it relates to the refuge and the ecosystem. Additional knowledge is needed to determine how the refuge should be managing and supporting the invertebrate population.

Strategies:

Tier 1:

- In 2012, initiate a monarch butterfly tagging and monitoring program with volunteers.

Tier 2:

- Work with universities to gain a better understanding of invertebrates, with an emphasis on pollinators and other key insects on St. Vincent Island.

Objective 1.7: Wildlife Inventory and Monitoring Plan - Develop and implement a wildlife inventorying and monitoring plan within 6 years of the CCP completion for the refuge.

Discussion: A plan will be developed to collect baseline information on plants, fish and wildlife; monitor, as resources permit, critical parameters and trends of selected species and species groups on the refuge; and base management on biologically and statistically sound data derived from such inventory and monitoring.

Strategy:

Tier 2:

- Develop and implement a wildlife inventorying and monitoring plan.

Goal 2. Rare, Threatened, and Endangered Species - Promote the recovery of rare, threatened, and endangered plants and animals.

Discussion: Recovery and protection of threatened and endangered plants and animals are important responsibilities delegated to the Service and its national wildlife refuges. Threatened and endangered state and federal listed plants and animals use St. Vincent NWR.

Objective 2.1: Red Wolf - Continue to remain a propagation site for the red wolf recovery program, managing a pack (adult pair and 2 consecutive pup litters) of red wolves on St. Vincent Island as long as necessary to meet recovery plan objectives.

Discussion: The refuge has participated as an island propagation site for the red wolf recovery program since 1990. The role of the refuge is to provide a safe place for red wolves to gain experience in a wild setting and to facilitate the propagation of red wolves. Wolves that have successfully gained wild experience on the island are typically transferred to mainland restoration sites to augment those populations.

Strategies:

Tier 1:

- Monitor and provide for the needs and safety of red wolves in the wild to ensure that they are alive and remain on the island using the guidelines set forth in the "Protocol for Island Propagation Projects."
- Maintain the red wolf pens and enclosure to ensure that red wolves are provided with health care, free access to fresh water, adequate food, shelter, and a clean, healthful environment using the guidelines set forth in "The Red Wolf Husbandry Manual" and "Protocol for Island Propagation Projects."
- Work with the recovery team to assist with trapping and health exams and to provide reports and updates.

Tier 2:

- Conduct an evaluation of food habits and habitat use of red wolves on St. Vincent Island.

Objective 2.2: Sea Turtles - Monitor sea turtle nesting daily from May through September and occasionally survey the beach areas for stranded sea turtles throughout the year.

Discussion: St. Vincent NWR has documented nest for loggerhead, green, and leatherback sea turtles on the beaches of St. Vincent Island. Loggerhead sea turtles frequently lay over fifty nests per year on refuge beaches. Green sea turtles occasionally nest on these beaches as well, whereas only two leatherback sea turtle nests have been documented on the refuge. The waters that surround the island provide important foraging and developmental habitat for these species, as well as for Kemp's Ridley sea turtles. The refuge relies heavily on volunteers to perform sea turtle monitoring.

Strategies:

Tier 1:

- Follow guidelines established in recovery plans, state and federal regulations, and the St. Vincent NWR sea turtle protocol.
- Evaluate nests for hatchling success rates.
- Continue to cooperate with the FWC by providing sea turtle nesting and stranding reports in a timely fashion.
- Cage all confirmed nests to reduce depredation.
- Target nest depredation issues with monitoring, targeted trapping, and humane euthanization of nuisance animals.
- Maintain the refuge's nesting beaches by restricting vehicle use on the beach, operating them on the hard-packed sand near the water's edge, and reducing beach driving to the amount necessary to conduct surveys.

-
- Restrict nighttime vehicle use on the beach with protocols to reduce the potential for disturbance to nesting and hatchling sea turtles.
 - Continue to hold annual sea turtle monitoring training for volunteers and staff and attend annual FWC training.
 - Implement a monofilament recovery and recycling program by installing and maintaining a monofilament recycling bin at the bridge over St. Vincent Creek.

Tier 2:

- Remove debris from the beach to reduce the impacts of discarded netting, traps, and other garbage on nesting and hatchling sea turtles.
- Evaluate data to determine habitats and nest locations.
- Maintain refuge website with annual nest information.
- In 2012, coordinate with FWC and University of Florida to rescue cold-stunned sea turtles near Pig Island.
- Work with the FWC to post signs regarding sea turtles and safe fishing practices (i.e., proper disposal of monofilament line and protocols to follow for hooked and entangled turtles) at the boat ramps.
- All exterior lighting associated with future new construction, visitor contact station/office locations or additional public toilet facilities should utilize full-cutoff (shielding) fixtures that allows no emission of light above the horizontal plane of the fixture and that does not allow short wavelength (white) light to be directly, reflectively, or cumulatively visible from the marine turtle nesting beach while meeting human safety needs.

Objective 2.3: Wood Storks - Inventory, monitor, and document wood stork activities on the refuge throughout the year to determine changes in behavioral patterns and trends while providing necessary habitat.

Discussion: St. Vincent NWR provides year-round habitat for the federally endangered wood stork. Wood storks utilize refuge wetlands throughout the year depending upon conditions of mainland habitats. No breeding has been documented on the refuge. Wood storks and other wading birds take advantage of concentrations of prey during wetland drawdowns and drought periods.

Strategies:

Tier 1:

- Document incidental sightings of wood storks.
- Conduct seasonal draw down on Lakes 1, 2, and 3 to provide favorable conditions for wood storks.

Tier 2:

- Annually conduct spring and fall population surveys for wood storks.

Objective 2.4: Snowy Plover - Annually inventory, monitor, and document snowy plover activities on St. Vincent Island throughout the year to determine trends and population while providing necessary habitat.

Discussion: The snowy plover is listed as a state listed threatened species. The majority of the breeding birds are located in the Panhandle, especially on public land (FWC 2003). The beach of St. Vincent Island is known to provide needed habitat for snowy plovers to rest, nest, and forage for food. The refuge has had at least 10 nesting pairs per year in recent years.

Strategies:

Tier 1:

- Support research studies to gather habitat and population information.
- Participate in Christmas Bird Counts and population surveys.
- Restrict staff beach driving speeds to 10 mph during the snowy plover nesting season.
- Ensure operation consistent with the FWC's guidelines for operating vehicles on the beach.

Tier 2:

- Conduct surveys during nesting season to determine need to modify or expand nesting closure areas.

Objective 2.5: Piping Plover - Annually inventory, monitor, and document piping plover activities on St. Vincent Island throughout the year to determine changes in behavioral patterns, trends, and population while protecting critical habitat areas.

Discussion: Piping plovers (federal and state threatened species) use the beaches and mudflat areas of the refuge during migratory and winter periods. Areas of the beach at Indian Pass, West Pass, St. Vincent Point, and Sheepshead Bayou have been designated as critical habitat for piping plovers. Less frequently, piping plovers will use other sections of the refuge's coastal areas as well.

Strategies:

Tier 1:

- Participate in annual Christmas Bird Counts
- Support population and habitat studies with partners.
- Support International Piping Plover Census program.
- Restrict staff beach driving and reduce speeds to 10 mph.
- Ensure operation consistent with the FWC's guidelines for operating vehicles on the beach.

Tier 2:

- Close beach and mudflat areas as needed to reduce boating and beach user activity during periods of piping plovers use.
- Monitor piping plover during the international shorebird surveys.

Objective 2.6: Gopher tortoise - Annually inventory, monitor and document gopher tortoise activities on St. Vincent Island throughout the year to determine changes in behavioral patterns, trends and population while providing necessary habitat.

Discussion: A small colony of gopher tortoises (state threatened species) exists on the southeast side of St. Vincent Island. Evidence suggests that historically there were some introductions of tortoises from the mainland. It is unknown if these tortoises augmented an existing natural population or founded a new population on the refuge. Recent investigations suggest that the population is stable or increasing at a slow rate.

Strategies:

Tier 1:

- Conduct periodic evaluations of gopher tortoise burrows for activity.
- Continue closure of tortoise use areas to disturbance with heavy equipment.

Tier 2:

- Support research to better understand gopher tortoises on St. Vincent Island.
- Aggressively control feral hog and raccoon populations.
- Evaluate the potential for stocking of additional tortoises on the island.
- Study population dynamics and status. Determine 10-year population trends.
- Burn habitat on a 2- to 4-year warm season rotation.
- Expand the use of warm season fire in management units adjacent to existing use areas to accommodate the expanding population.

Objective 2.7: Eastern Indigo Snake - Support the recovery of the declining species population by evaluating the various benefits and issues to stocking the species on St. Vincent Island over the next 10 years.

Discussion: The eastern indigo snake is a federal and state threatened species. It is unknown if there was a historic population of this species on St. Vincent Island. Three adult and 37 juvenile eastern indigo snakes were released on St. Vincent Island from 1980 to 1982. Subsequent searches in 1986 to 1989 revealed 0.9-snake captures per search day. No verified sightings have occurred in recent years.

Strategies:

- Determine if it is suitable or not to introduce the species on to St. Vincent Island.
- Aggressively control feral hog and raccoon populations.

Objective 2.8: Florida Manatee - Support the recovery of the Florida manatee population by assisting partners with public education and awareness about the species over the next 15 years.

Discussion: The Florida manatee, a federal and state endangered species is a subspecies of the West Indian manatee. They are found throughout Florida and neighboring states. During certain times of the year, primarily warm weather months, they have been known to use the waters adjacent to St. Vincent NWR. They have been documented at the refuge's mainland boat dock.

Strategies:

Tier 1:

- If requested and able, assist the Service and partnering agencies by providing available staff or refuge equipment/vehicles for use in stranding events (dead or injured animals) or research and monitoring studies.

Tier 2:

- Post awareness signs.

Objective 2.9: Gulf Sturgeon - Over the next 15 years assist partners with the recovery efforts of the Gulf sturgeon to meet the recovery objectives.

Discussion: Gulf sturgeons (federal threatened species) are anadromous, migrating into freshwater systems to spawn and returning to the marine waters in the fall to overwinter. Sub-adult and adult Gulf sturgeons do not feed while in fresh water; consequently, the marine portion of their life history where feeding and growth occur is very important. Gulf sturgeons have been documented using the coastal and bay waters adjacent to St. Vincent Island. In addition, Gulf sturgeons have been documented moving through the Indian Pass and West Pass corridors (two of four entries into the Gulf of Mexico) en route to offshore destinations.

Strategies:

Tier 2:

- Partner with the Service and other agencies to support research needs for recovery of species.
- Post awareness signs as needed or requested.

Objective 2.10: Federal and State Listed Plants - Throughout the life of the CCP, work with partners to inventory and monitor the refuge for sensitive plants to gain a better understanding of the population size, location, and habitat requirements.

Discussion: There are no known federally listed plants within the current refuge boundary. However, plants that occur on the refuge with state protection are Florida corkwood, West's flax, Gulfcoast lupine, and Florida beargrass. Little is known about the life-history requirements and distribution of these plants on the refuge.

Strategies:

Tier 2:

- Conduct a rare plant survey and map the distribution of these species.
- Determine management needs of sensitive plants and provide protection.
- Aggressively control feral hog populations.
- Survey 14 Mile site and Pig Island for sensitive plants.

HABITAT MANAGEMENT

Goal 3: Habitat Management - Protect, maintain, enhance, and restore suitable habitat for the conservation and management of migratory birds, resident wildlife, fish, and native plants, including all rare, threatened and endangered species.

Discussion: St. Vincent Island, the main unit of the refuge possesses an extraordinary degree of natural landscape heterogeneity, stemming from the dynamics of a barrier island surface geology, most importantly erosion and accretion of surface sediments. The landscape is a series of long, narrow, xeric dune ridges, pine flatwoods, and wet swales roughly paralleling the seaward beachfront. Pig Island consists of primarily pine flatwoods and scrub habitats surrounded by estuarine marsh. The 14 Mile site is mostly pine flatwoods and estuarine marsh.

Objective 3.1: Saltwater and Freshwater Marsh - For the next 15 years, restore and maintain 4,370 acres of marsh to ensure healthy and viable ecological communities, with emphasis on migratory birds and threatened and endangered species and with a focus on St. Vincent Island.

Discussion: St. Vincent NWR currently has 3,600 acres of saline and brackish estuarine marshes primarily in the Big Bayou, Sheepshead Bayou, and Mallard Slough areas. Naturally functioning estuarine marshes are important nursery areas and are usually considered more ecologically productive than other wetlands due to the energy interchanges associated with tidal waters. Throughout St. Vincent Island in the wet swales are 770 acres of freshwater marsh.

Strategies:

Tier 1:

- Continue restoration of hydrology with road removal and appropriate low water crossing and culvert placement.

Tier 2:

- Conduct 2-year rotational burns, alternating years on the area north of Big Bayou and Mallard Slough.
- Conduct research and studies to monitor impact to key species.

Objective 3.2: Open Water - Seasonally manipulate and manage the 170 acres of open water on St. Vincent Island to provide necessary habitat for migratory birds, threatened and endangered species, and freshwater and saltwater fish to maintain or enhance populations.

Discussion: For over a hundred years the water on St. Vincent Island has been manipulated with various types of structures. There are six large open water bodies (Lakes 1, 2, 3, 4, and 5 and Oyster Pond) on the island. Lakes 1, 2, and 3 are managed as brackish to intermediate systems and Lakes 4 and 5 as freshwater. Oyster pond is managed as a natural evolving system.

Strategies:

Tier 1:

- Monthly monitor water quality and water levels with more intense monitoring during seasonal draw downs.
- Continue to manage Lakes 1, 2, and 3 with emphasis on very shallow water at key periods. Use seasonal draw downs to support moist soil conditions and shorebirds, wading birds and habitat for migrating and wintering waterfowl.
- Manage Lakes 4 and 5 as deep freshwater (less than 3ppm salinity), with periodic drawdowns as prescribed in the step-down Habitat Management Plan.
- Continue to manage Oyster Pond as a natural system.

Tier 2:

- Annual summer (July to August) evaluation of vegetation to determine need to control nuisance species. Monitor the trends in open water at least every 10 years. Maintain the five water control structures on St. Vincent Island (i.e., A, B, E, and Rattlesnake Roads and St. Vincent Creek Bridge).
- Monitor the vegetation change in response to the water management program.

Objective 3.3: Beach and Dunes - Maintain 490 acres of beach and dune habitat on St. Vincent Island with minimal human disturbance to benefit migratory bird populations, threatened and endangered species for the next 15 years.

Discussion: St. Vincent Island Beach and associated dunes provides forage, nesting and resting habitat for many threatened and endangered species as well as other sensitive species. This habitat is critically important as surrounding area beach and dune habitat is being manipulated by human impacts.

Strategies:

Tier 1:

- Maintain limited access to the beach from the interior part of island to reduce dune deterioration avoiding areas of dune development.
- Restrict staff beach driving to essential management and reduce speeds to 10 mph.
- Manage downed trees on beach with chainsaws only.
- Patrol beach to reduce damaging litter.

Objective 3.4: Roads - Over the 15 year life of the CCP, maintain roads to provide access for necessary refuge management while converting abandoned roads to their original habitat to support a more natural hydrological system.

Discussion: For over a hundred years, St. Vincent Island's natural environment has been altered by a matrix of roads. Over the years the number of road miles increased to support management practices on the island. In 2005, the 90-mile road system was reduced to 45 functioning miles to support the needs of hydrological restoration efforts. The remaining 45 miles of roads, as well as the non-functioning roads, need alteration to support a more natural hydrological system.

Strategies:

Tier 1:

- Continue to restore the natural dune and swale habitat on previously closed roads to allow natural flow of water.
- Continue restoration of hydrology around existing roads with installation of appropriate low water crossings and culverts.
- Maintain the bridge over St. Vincent Creek near cabin site.

Tier 2:

- Evaluate road system to determine need for additional surface improvements.

Objective 3.5: Forest Management - Within 10 years of the completion of the CCP, conduct a forest habitat assessment on the 6,500 acres of upland habitat on St. Vincent Island and 14 Mile site to determine historical condition, current condition, and future desired condition.

Discussion: The first timber sale on St. Vincent Island was in the 1940s, followed by additional harvesting in the 1960s before it was sold to TNC and then to the Service. Both St. Vincent Island and the 14 Mile site have moderate- to over-stocked overstory of slash pine, little to no midstory, and a dense continuous layer of palmetto. Throughout the refuge are ridges of mature live oak stands.

Strategies:

Tier 1:

- Update Habitat Management Plan by 2017.
- Determine future desired condition by studying historical vegetation patterns on the refuge and develop management options.

Tier 2:

- Develop historical vegetation maps and investigate changes in vegetation over time.
- Conduct an analysis of large scale disturbances (e.g., hurricanes, wildfires) on vegetation structure.
- Establish long-term demographic studies of forest structure.

Objective 3.6: Fire Management - For the next 15 years, continue prescribed fire program using the current 15 burn units for St. Vincent Island and 14 Mile site with a focus on prescribed burning 3,000 to 5,000 acres per year, with 30 to 50 percent in the growing season.

Discussion: Most of the burning on St. Vincent NWR has been conducted during the dormant season, but an effort to shift toward lightning (growing) season burning has begun in recent years.

Strategies:

Tier 1:

- Operate under the fire management plan and prescribed fire monitoring plan.
- Annually write prescriptions for current years proposed burns.
- Wildfire will be contained at burn unit boundaries on St. Vincent Island.
- Wildfire will be contained at 14 Mile unit boundaries.
- Monitor wildfires on Pig Island.
- Conduct warm season burning to promote grassy-herbaceous understory.

Tier 2:

- Enhance habitat for species of concern, targeted species, and species of federal responsibility.
- Establish fuels monitoring program.
- Continue to study/monitor seaside sparrow and fire relationships.
- Develop a fuels map of the refuge, reflecting condition of fuels and successional trends.
- Conduct an analysis of the effectiveness and efficiency of the fire management program in terms of successes or failures of management objectives.
- Conduct an investigation of fire history and estimate natural fire frequency for community types on the refuge.
- Expand fire research related to effects on habitat and species.

Objective 3.7: Habitat Management Plan - Develop and implement a habitat management plan within 5 years of CCP completion for the refuge.

Discussion: A habitat management plan (HMP) is a step-down plan of the refuge CCP. The lifespan of the HMP is 15 years and parallels that of refuge CCPs. HMPs are reviewed every 5 years utilizing peer review recommendations, as appropriate, in the HMP revision process or when initiating refuge CCPs. Depending upon the refuge, an annual HMP may be needed to address habitat goals and objectives for the year.

Strategies:

Tier 1:

- Complete a 15-year HMP.

Tier 2:

- Complete annual habitat workplan.
- Develop a vegetation monitoring program to evaluate management practices.
- Develop a more refined ecological map of plant communities.

Goal 4: Exotic, Invasive, and Nuisance Species - Manage exotic, invasive, and nuisance species on the refuge to maintain and enhance the biological integrity of refuge habitats.

Discussion: In recent years, exotic species' invasions throughout North America have greatly impacted native species, ecosystem processes, the economy, and human health. As a result, the Service has made the monitoring and managing of invasive species a high priority. It is now believed that invasive exotic species (plants, animals, and pathogens) are the second biggest threat to the conservation of biodiversity, behind only habitat destruction (Tempel et al. 2003).

Objective 4.1: Feral Hogs - Over the next 10 years, work with partners to aggressively work to eradicate the feral hog population on St. Vincent Island.

Discussion: Feral hog is the most prolific and destructive of the exotic invasive species on the refuge. They can have an adverse effect on the habitat and productivity of most native wildlife using virtually all habitat components of the landscape and directly competing for food. The refuge is currently attempting to manage population levels through the three public hunts and opportunistic control by staff.

Strategies:

Tier 1:

- Conduct public outreach and educational programs related to removal of the feral hog population.
- Use various partners and techniques to assist with the eradication program.

Objective 4.2: Sambar Deer - For the next 15 years, continue to manage the sambar deer herd to maintain a population size range of 75 to 100 on St. Vincent Island.

Discussion: In 1908, four sambar deer (three hinds and one stag) were introduced to St. Vincent Island. By 1940 the herd had grown to several hundred individuals. During the mid-1970s, there was an attempt to eradicate the herd. After several research studies were conducted, it was determined that there was no indication the sambar deer represented a threat to white-tailed deer or other native species on the island. A management decision was made to maintain the herd between 75 to 100 head.

Strategies:

Tier 1:

- Maintain a limited hunt program

Tier 2:

- Evaluate partnering with the Service to conduct population surveys.

Objective 4.3: Coyotes - For the next 15 years, with partner support, continue to remove coyotes from St. Vincent Island immediately after the situation occurs.

Discussion: During the mid- to late-1800s the eastern North America landscape was undergoing rapid habitat alteration. As changes occurred the wolf populations declined and the more adaptable coyote populations began to increase. By 1990, the coyote had been established in all the eastern states and Canadian provinces as well as onto many large offshore islands (Parker 1995). St. Vincent Island has occasional sightings of coyotes.

Strategies:

Tier 1:

- Remove any known coyotes on St. Vincent Island.

Tier 2:

- Weekly survey and document potential coyote activity on St. Vincent Island.

Objective 4.4: Other exotic, invasive, and nuisance animals - During the life of the CCP, continue to inventory and monitor for other exotic, invasive, and nuisance animals eradicating new invasives, and controlling population levels of exotic and nuisance animals.

Discussion: As the ranges of exotic and invasive animals expand, it is important to maintain an understanding of the change that could occur on the refuge through inventorying and monitoring. When deemed detrimental to the management goals of the refuge, control measures should be taken to the fullest practical extent. With unknown future conditions, some native species populations may become unbalanced and adaptive management is needed to adjust the populations.

Strategies:

Tier 1:

- Monitor refuge and document signs of new or increased populations of exotic, invasive, and nuisance animals.
- Opportunistically control raccoons to prevent loss of sea turtle nests.

Objective 4.5: Exotic, invasive, and nuisance terrestrial and aquatic plants - During the life of the CCP, continue to inventory and monitor for other exotic, invasive, and nuisance terrestrial and aquatic plants, eradicating new invasives and controlling population levels of exotic and nuisance plants.

Discussion: There are numerous exotic/invasive species in Florida many which are expanding their range into the Panhandle. It is the role of the refuge to assist with reducing the spread of these species by inventorying, monitoring, and controlling exotic, invasive, and nuisance terrestrial plants species on the refuge. Currently, there are 33 exotic and or invasive species on St. Vincent Island. In recent years, the refuge has been able to eradicate the Japanese climbing fern and cogon grass populations. A key concern for the refuge is the eradication of Chinese tallow. Aquatic species of primary concern include cattails and *Phragmites*.

Strategies:

Tier 1:

- Implement program to prevent introductions of invasive exotic plants and follow protocols for cleaning equipment transported to the refuge.
- Continue to work towards eradication of the established Chinese tallow population.
- Continue to post awareness signs about exotic aquatic vegetation.

Tier 2:

- Annually monitor and maintain database of exotic, invasive and nuisance plants on the refuge.
- Conduct an extensive invasive species survey.
- Continue to monitor and manage cattails.
- Manage Lakes 4 and 5 to limit the coverage of aquatic vegetation to no more than 25 percent.
- Conduct a study to determine species of *Phragmites* and determine control needs.

Objective 4.6: Exotic, Invasive, and Nuisance Species Control Plan - Within the next 2 years, enhance and develop plans to address management techniques to handle exotic, invasive, and nuisance species on refuge lands.

Discussion: When St. Vincent Island was privately owned, it was well known for its variety of exotic fauna. Several species that inhabit the refuge are considered exotic or nuisance species. They include feral hogs, sambar deer, nine-banded armadillo, raccoon, and coyote. Introductions of feral cats, dogs, and other species have occurred although they pose no immediate threat at this time. The refuge must be diligent and respond immediately to future introductions as well as take appropriate measures to control or eradicate existing exotic, invasive, and/or nuisance species.

Strategies:

Tier 1:

- Update animal control plan by 2013.
- Develop a treatment plan to chemically and mechanically manage exotic, invasive, and nuisance plants.

Tier 2:

- Develop a management plan to control and eradicate exotic, invasive, and nuisance plants using approved chemical, mechanical, and biological methods by 2013.

RESOURCE PROTECTION

Goal 5: Climate Change - Adapt management consistent with the best available scientific projections regarding environmental changes in order to protect refuge resources.

Discussion: Global climate change poses risks to human health and to terrestrial and aquatic ecosystems. Important economic resources such as agriculture, forestry, fisheries, and water resources also may be affected. Warmer temperatures, more severe droughts and floods, and sea level rise could have a wide range of impacts. All these stresses can add to existing stresses on resources caused by other influences such as population growth, land-use changes, and pollution. The Service's key strategies to address climate change are adaptation, mitigation, and engagement.

Objective 5.1: Outreach and Education - As science, technology, and policy evolve, become more aggressive at educating partners and the public about the Service direction on climate change.

Discussion: The Service defines the engagement strategy for addressing climate change as reaching out to Service employees; local, national and international partners in the public and private sectors; key constituencies and stakeholders; and the broader citizenry of this country to join forces and seek solutions to the challenges to fish and wildlife conservation posed by climate change. The Service intends to build knowledge and share information about climate change in a comprehensive and integrated way.

Strategies:

Tier 1:

- Continue to provide staff with ways to gain an understanding and knowledge of the key issues related to climate change.
- Promote the Service's message on climate change to various audiences related to the refuge.

Objective 5.2: Research and Monitoring - During the life of the CCP, work with partners to gain a more indepth knowledge of climate change impacts to the refuge, with a focus on sea level rise, salinity levels, and changes in vegetation and wildlife species.

Discussion: Impacts to the refuge due to climate change could include changes in precipitation patterns, warmer temperatures, and possibly, an increase in the frequency of tropical cyclones, and distributional shifts of species, with more tropical species moving into the area and with the local extirpation of species with temperate origins (Emanuel 1987, McCarty 2001, Parmesan and Yohe 2003, Root et al. 2003, Emanuel 2005, Hannah et al. 2005, Webster et al. 2005, Mann and Emanuel 2006, Parmesan 2006, Intergovernmental Panel on Climate Change 2007, NOAA 2008). An increase in the projected intensity and/or frequency of tropical systems could increasingly impact the refuge with wind and flood damage. The change in rainfall and evapotranspiration rates could change the makeup of the lakes on St. Vincent Island. Sea level rise could change habitat types, thus changing species composition on the refuge. Because of the uncertainty of intensity and distribution of impacts caused by climate change, one of the best management tools the refuge can utilize is the gathering of information.

Strategies:

Tier 1:

- Coordinate with partners to establish benchmarks to measure sea level rise.
- As new information is available re-evaluate the future status of refuge lands.
- Adapt management as necessary.

Tier 2:

- Prioritize climate change impacts to rare, threatened, and endangered species. Coordinate with partners to monitor changes in salinity levels, associated vegetation species and wildlife species.
- Conduct a study on long-term effects of sea level rise on the ecological communities of St. Vincent NWR.

Goal 6: Resource Management and Protection - Maintain, preserve, and protect archaeological, cultural, historic, and natural resources representing the natural and cultural history of the local area.

Discussion: Protection and preservation of our Nation's cultural and historic resources are important parts in maintaining its heritage. Also, conserving, protecting, and enhancing fish, wildlife, plants, and their habitats is the mission of the Service. The Apalachicola area is rich in cultural and historical heritage as well as biological diversity. As a landowner within this area, the refuge plans to manage and protect resources and partner with others to support the needs of the local area for future generations to enjoy.

Objective 6.1: Visitor Safety and Resource Protection - Within a year after the approval of the CCP, determine amount of need (time, type of issues) and obtain sufficient law enforcement resources to ensure resource protection and a safe environment.

Discussion: Protecting the natural and cultural resources of St. Vincent NWR and ensuring the safety of all visitors are fundamental responsibilities of the Refuge System. In recent years, the refuge has lost three on-site collateral law enforcement positions. Currently, law enforcement support is administered by the law enforcement program at St. Marks NWR.

Strategies:

Tier 1:

- Seek partnerships with other agencies to support local area law enforcement.
- Annually maintain a disaster action plan.

Tier 2:

- Seek a Complex federal wildlife officer position with primary duty station at St. Vincent NWR to split time within the Complex.

Objective 6.2: Archaeological and Historical Site Protection - For the next 15 years, work with partners to gain a better understanding of the cultural resources on refuge lands while protecting known sites.

Discussion: The Service values and protects archaeological and historical resources as defined in the National Historic Preservation Act of 1966, the Native American Grave Protection and Repatriation Act of 1990, and the Archaeological Resources Protection Act of 1979. The refuge lies in an area that has a rich cultural history. However, only a small percentage of the refuge has been surveyed for archaeological and historical resources. Additional cultural resource surveys would help better protect these valuable resources.

Strategies:

Tier 1:

- Protect all known archaeological sites on the refuge from illegal take or damage in compliance with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act and the National Historic Preservation Act.
- Actively consult with regional archaeologist on known sites and any ground disturbing projects.

-
- Promote educational awareness to the public by providing an understanding and appreciation of the refuge's ecology and the human influence on the region's ecosystems. Insert a section into the visitor's brochure/map that indicates it is illegal to pick up artifacts and the penalties for breaking the law.
 - Provide staff and volunteers opportunities to gain a better understanding of laws and process of protecting archaeological sites.

Tier 2:

- Conduct a refuge-wide cultural resource survey. Include a primary cultural resources survey on Pig Island and the 14 Mile site.
- Work with archaeologists and repositories to achieve proper curation and management of archaeological collections from the refuge so they can be scientifically useful.
- Continue to build the partnership with University of South Florida and Florida State University as well as others to gain additional knowledge of the cultural resources.
- Start a program of periodic monitoring by refuge staff of the archaeological sites, both on a regular basis and after significant storms or other events that might expose new shoreline.
- Evaluate the efficacy of existing signage and other law enforcement tactics to deter illegal activity associated with cultural resources.
- Continue to digitize historic photographs, maps, and documents. The photographs include those taken to document refuge activities and subsequently used in the annual narratives.
- Develop a GIS layer for the refuge cultural resources sites that can overlay with other GIS layers including habitat types, vegetative cover, hydrology, and soils.
- Evaluate consulting an archaeological firm to generate a 1-foot topographic contour map and conduct a remote sensing archaeological survey of the Fort Mallory site to better understand the extent of the fortification.
- Procure pertinent scientific reports and articles and produce an annotated bibliography to document the region's history, geomorphology, and the utility of the scientific methodology.
- Evaluate the effects of fire management activities on cultural resources in the vicinity of those activities and modify activities so they will not disturb cultural resources.
- Continue geomorphic investigation of St. Vincent Island, the evolution of the beach ridge system, and factors critical in the formation and alteration of the barrier island.

Objective 6.3: Land Acquisition - Over the life of the CCP, pursue willing sellers and explore methods to protect land to fulfill the purpose for which the refuge was established.

Discussion: A refuge acquisition boundary is an administrative line delineating areas in which the Service may consider negotiations for inclusion of those areas within the management of a particular national wildlife refuge. The Service's policy is to acquire property or interests in property only from willing sellers. Lands within a refuge acquisition boundary do not become part of the refuge unless and until a legal interest is acquired (e.g., through a management agreement, easement, lease, donation, or purchase). The refuge has recently completed a Minor Expansion Plan (MEP), which allows for the potential purchase of lands up to 1,247 acres along Apalachicola Bay to support refuge management purpose.

Strategies:

Tier 1:

- Support state land acquisition program with SHC initiative and LCC.
- Determine relationship with state on the management of Flag Island/Bird Island.

Tier 2:

- Seek opportunities to acquire lands from willing sellers identified in the MEP.

Objective 6.4: Farm Service Agency (FSA) conservation easements - Annually work with the 21 conservation easement owners to protect the conservation easement as stated in the easement language.

Discussion: Currently, the refuge oversees 21 FSA conservation easements that total 1,625 acres. The easements are located in Calhoun, Holmes, Jackson, Okaloosa, Walton, and Washington Counties. These easements were acquired when FSA was originally named Farmers Home Administration (FmHA). Most of these easements were obtained through a debt-reduction program that placed a perpetual conservation easement on the property. After a Service review of the property, easements were established and the Service was named easement manager, administered as part of the Refuge System.

Strategies:

Tier 1:

- Annually conduct a compliance check on all easements.

Tier 2:

- Manage easements to fulfill guidance and recommendations supporting the SHC initiative /LCC concept.

VISITOR SERVICES

Goal 7: Visitor Services - Promote an understanding and appreciation of fish and wildlife resources and provide the public with quality and safe outdoor education and recreation experiences that are compatible with natural resource conservation and the primitive-use concept of the refuge.

Discussion: Currently, St. Vincent NWR receives approximately 8,000 to 10,000 visitors per year. The refuge is compatible with all six Service priority public use activities (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation).

Objective 7.1: Welcome and Orient Visitors - Within the 15-year life of the CCP, provide the public with a variety of ways to learn about the refuge while maintaining up to date information and signage.

Discussion: The refuge strives to provide clear information to guide the public as to where they can go, what they can do, and how to safely and ethically engage themselves into recreational and educational activities. With this thought, the refuge currently operates a contact station in Apalachicola that is open to the public Monday through Thursday. Also, there are various brochures and other information that can be obtained through the refuge website and at the contact station. The refuge provides directional, boundary, and regulatory signage to guide the public to the proper places on the refuge.

Strategies:

Tier 1:

- Maintain the public contact station in Apalachicola.
- By 2013, evaluate directional, entrance, boundary and regulatory signage, and implement annual maintenance plan and order new signs as needed.

-
- In 2012, update visitor information on refuge web site regarding programs and facilities and provide monthly updates.
 - Continue to evaluate and maintain existing kiosks and panels
 - By 2014, evaluate all refuge brochures for current information and maps.

Tier 2:

- By 2014, evaluate options for visitor contact station/office location with future desire to develop visitor contact station/office on refuge lands.
- Evaluate the need to install additional public toilet facilities on the refuge within the next 10 years.

Objective 7.2: Hunting - During the life of the CCP, continue to provide three hunting opportunities on St. Vincent Island as long as species population levels continue to remain stable.

Discussion: Hunting is an appropriate and compatible wildlife-dependent recreational opportunity on St. Vincent Island. The hunt program is structured to provide the hunter an opportunity to help maintain a healthy, balanced white-tailed deer herd, maintain the sambar deer herd population between 75 and 100, and support the removal of feral hogs and raccoons. Currently, the refuge provides three permitted hunts (archery and primitive weapons for white-tailed deer, feral hogs, raccoons and a lottery sambar deer primitive hunt including feral hogs and raccoons). There is currently no waterfowl hunting on the refuge.

Strategies:

Tier 1:

- Continue to provide three permitted hunts. Due to logistics and safety issues, hunters are permitted to camp in two designated areas (West Pass and Indian Pass) during white-tailed deer hunts and one area at West Pass for sambar deer.
- Provide public annual information on hunting opportunities.

Tier 2:

- As feral hogs are eradicated from the island, update the hunt program to reflect the change.
- Annually review and edit 50 CFR for regulation changes to hunting program.
- Within 5 years of the date of the final CCP, develop an evaluation to determine the effectiveness of the hunt program and complete an updated hunt plan.
- Immediately determine the need to create additional hunting informational signs to help hunters understand the hunt process.
- Within the next 2 years, work with FWC to reevaluate (with historic data) and determine carrying capacity to determine the number of permits to be issued to the hunters.
- Partner to conduct population surveys of game species.
- Survey and monitor to detect changes in white-tailed deer populations while maintaining a database.

Objective 7.3: Fishing - During the life of the CCP, provide the public with opportunities to freshwater and saltwater fish on St. Vincent Island while educating the public about the resource.

Discussion: Fishing is an appropriate and compatible wildlife-dependent recreational opportunity on St. Vincent Island. For many years, St. Vincent Island has been managed to support freshwater and saltwater fisheries programs. Depending on environmental conditions, some years are better than

others for fishing. The refuge allows fishing from the bank and boat (no gas motors). The refuge manages the fish populations in accordance with state regulations.

Strategies

Tier 1:

- Allow bank fishing year round in Lakes 1, 2, 3, 4, 5 and Oyster Pond.
- Continue to allow boat use (no gas motors) in Lakes 1, 2, 3, 4, 5 and Oyster Pond between May 15 to September 30.
- Continue crabbing and oystering in accordance with state regulations year-round from Oyster Pond water control structure to the Gulf and the St. Vincent Creek Bridge to the Bay.
- Continue restocking of native freshwater species in Lakes 4 and 5 as necessary.
- By 2014, update fishing brochure to include new fishing regulations and include labeling of lakes and open dates for fishing.

Tier 2:

- Over the next 5 years, explore opportunities to partner with at least two other agencies/groups to educate children and adults about fishing.
- Institute self-check program for anglers catch in island lakes.
- Conduct a contaminate survey in lakes to determine quality of fish health.

Objective 7.4: Environmental Education - Over the next 15 years, focus on environment education programs related to imperiled species and the unique barrier island history and the ecosystem as it relates to the coastal environment, and management style incorporating climate change effects.

Discussion: Environmental education is an appropriate and compatible wildlife-dependent recreational opportunity on St. Vincent NWR. With a small staff the refuge's environmental education program has been limited. The refuge has provided programs that meet the Florida Sunshine State Standards for education.

Strategies:

Tier 1:

- With support of St. Marks NWR staff, continue to work with partners (schools, governmental agencies and non-governmental agencies) to build stronger relationships to educate local students about natural resources.
- Establish a protocol and requirements for environmental education volunteers by 2012.
- Conduct environmental education training for all volunteers and conduct annual refresher trainings.

Tier 2:

- Within 3 years of the date of the final CCP, develop environmental program.
- Within the next 10 years, enhance environmental education program outlines and/or lesson plans incorporating Florida Sunshine State Standards.
- Complete environmental education sections of website by 2015 and maintain monthly updates.
- Work with partners to develop educator workshops and implement for targeted number of educators by 2022.
- During the 15-year life of the CCP, develop an evaluation to determine the effectiveness of the environmental education program.

Objective 7.5: Interpretation - Over the 15-year life the CCP, focus interpretation messages to relate to imperiled species and the unique barrier island ecosystem and history while including new key messages on global climate change, SHC initiative, and LCCs with on-and off-site programs.

Discussion: Interpretation is an appropriate and compatible wildlife-dependent recreational opportunity on St. Vincent NWR. The refuge provides the public with information at the open house, special events, website, brochures and kiosks, and at the office in Apalachicola.

Strategies

- Over the next 15 years, create three to five new interpretive panels to address the key interpretive message (imperiled species and the unique barrier island ecosystem and history) while maintaining existing panels.
- Within the next 10 years, create station specific video and virtual tours of the refuge as needed.
- Within the next 3 years, create a visitor services map tear sheet or brochure that indicates main roads, foot trails, main public use areas, etc.
- Complete interpretation opportunities on the website by 2015 and maintain monthly updates.

Objective 7.6: Wildlife Observation and Photography - Over the next 15 years, strive to maintain and enhance wildlife observation and photography opportunities by providing the public additional ways to connect with nature while continuing to protect the resources.

Discussion: Visitors of all ages and abilities have the opportunity to observe and photograph fish, wildlife, and plants on St. Vincent NWR. St. Vincent Island has multiple roads for observing and taking photographs. However, it is a primitive environment and visitors need to be prepared for the conditions. Currently, there is no structured refuge photography program but the opportunity for self-guided photo opportunities is endless. During certain times of the year there are opportunities for refuge supported wildlife observation opportunities.

Strategies:

Tier 1:

- Maintain hiking trails and primitive road system.

Tier 2:

- Evaluate offering monthly tours sponsored by friends group.
- Establish 5 key photo spots with Global Positioning Systems (GPS) points with accompanying maps and post on website by 2014.
- Within 5 years of the date of the CCP, evaluate a proposed observation platform with interpretative panels, viewing scope, a restroom, trail and kayak launch for 14 Mile site.
- With partners, host one photo class per year by 2016.
- Evaluate and consider expanding non-motorized trails (i.e., Indian Pass area) on refuge by 2015.
- By 2018, create a virtual tour of the refuge for the website. Work with partners such as St. Marks NWR Photo Club to accomplish.
- Explore the possibility of creating a refuge DVD.

Objective 7.7: Outreach - During the 15-year life of the CCP, actively seek and maintain communication between refuge staff and volunteers, local residents, visitors, and refuge supporters by providing awareness and educational materials to increase their knowledge of the refuge and its mission. The refuge's key message will focus on imperiled species and the unique barrier island

ecosystem and history while including new key messages on global climate change, SHC initiative, and LCCs with on and off site programs.

Discussion: Effective outreach depends on open and continuing communication and collaboration between the refuge and its many users. The refuge and the resources would benefit if more local area residents become aware of the refuge and its purposes and understand its conservation goals and objectives. Outreach efforts typically focus on awareness of activities occurring on the refuge.

Strategies:

Tier 1:

- Continue to strengthen public relations with local, state, and federal elected officials.
- Continue monthly article in The Apalachicola Times and expand to other nearby media outlets.
- As events occur, submit news release articles to the local media and issue public notices for proposed actions.
- Continue to maintain and expand on current media contact list while strengthening relations with local outreach organizations.
- By 2013, actively maintain current visitor information on refuge web site regarding programs and facilities.

Tier 2:

- Work with partners to annually support at least three local outreach activities/events promoting the refuge purpose and mission.
- Develop an outreach plan by 2018.
- Become member of Chamber of Commerce and Tourist Development Council organizations.

Objective 7.8: Volunteers - During the 15-year life of the CCP, provide opportunities for local and seasonal volunteers to assist the refuge in completing projects that meet the refuge mission.

Discussion: Volunteers provide the refuge with their gifts of time, skills, and energy. They are a key resource for the refuge to accomplish many tasks involving administrative support, biological assistance, and maintenance expertise. For the last several years the refuge has worked with an average of 25 volunteers a year and the State of Florida Department of Corrections, Bay City work camp crew.

Strategies:

Tier 1:

- Continue to support local and seasonal volunteers.
- Continue annual volunteer training and recognition program.
- Continue to follow Service policy and guidance to recruit volunteers and manage the volunteer program.
- Annually renew volunteer agreements and perform volunteer evaluations.
- Continue to support local RV volunteers to support refuge operations

Tier 2:

- Within 3 years of the date of the CCP, create a volunteer management plan.
- Evaluate carrying capacity of volunteers for certain tasks.

-
- Maintain and enhance 14 Mile RV trailer campsite area to include the installation of concrete pads for all sites with a common, screened picnic pavilion.

Objective 7.9: Friends Group - Partner with the refuge friends group (Supporters of St. Vincent NWR, Inc.) over the next 15 years, to address refuge needs (labor and materials) that support the refuge goals.

Discussion: Supporters of St. Vincent NWR, Inc. was established in November 2006. A cooperative agreement with the Service was signed in July 2007. The purposes for which the Supporters of St. Vincent NWR, Inc., was organized are to promote better understanding, appreciation, and conservation of the natural history and natural environment of the Florida panhandle, and in particular, St. Vincent NWR. The board members consist of a group of seven individuals.

Strategies:

Tier 1:

- A staff member will attend monthly Supporters of St. Vincent NWR, Inc., meetings to provide refuge updates to the group.
- Continue to provide Supporters of St. Vincent NWR, Inc., with office space for operations of the group if feasible.
- Annually provide Supporters of St. Vincent NWR, Inc., with a project proposal list with estimated budgetary needs.
- Annually conduct a retreat with Supporters of St. Vincent NWR, Inc., board, and staff to establish goals that support the refuge mission.

Tier 2:

- In 2012, work with Supporters of St. Vincent NWR, Inc., to complete Supporters of St. Vincent NWR, Inc., website.
- Provide training for staff and board to increase their knowledge and understanding of board and member recruitment, financial management, and other Service policy and guidance.

Objective 7.11: Access - Clearly define to the public all legal public access to St. Vincent NWR and access across the island within 3 years of CCP approval. Maintain the public boat landing access at the west end of St. Vincent Island for daylight use that is compatible with refuge purposes.

Discussion: The entire refuge is currently open to the public during daylight hours throughout the year unless restricted by refuge operations or wildlife activity. There are three public mainland boat ramps (Ten foot hole in Apalachicola, Two-Mile site, and Indian Pass county ramp) that primarily support travel to St. Vincent Island. There is a refuge dock at the west end of the island where boats can load and unload. Visitors are also allowed to beach their own boats along areas of the island unless area closed by signage. Visitors are allowed non-motorized access across the island on marked roads and trails. Roads running north/south are numbered; roads running east/west are labeled with letters.

Strategies:

Tier 1:

- Clearly state legal access for visitors on refuge website and in all refuge publications.

Tier 2:

- Improve signage at public boat ramps on the mainland and the loading/unloading dock on St. Vincent Island to clarify access and permitted uses on the refuge.

Objective 7.12: Visitor Services Plan - Within 5 years of the date of the CCP, prepare and begin to implement a Visitor Services Plan to provide overall management guidance of public use on the refuge.

Discussion: A visitor services plan is a management plan that contains specific strategies that the refuge plans to accomplish to meet the visitor service goals and objectives which integrates wildlife-dependent and other recreational uses on a refuge. Understanding the resource needs and the relation with the public is a key component of the plan in such a unique primitive environment as St. Vincent Island.

Strategies:

Tier 2:

- By 2016, complete a Visitor Services Plan that reflects current legislation; Director's orders; initiatives; policy; and the mission of the refuge, the Refuge System, and the Service. The plan should also address the current and future visitor services and recreation needs of refuge visitors throughout the North Florida NWR Complex.
- By 2017, prepare and develop a site/use plan for 14 Mile site.
- By 2015, contract with researchers to initiate and complete a study establishing a maximum carrying capacity limit of visitors on St. Vincent Island.

REFUGE ADMINISTRATION

Goal 8: Refuge Administration - Obtain resources necessary to ensure that the goals and objectives for refuge habitats, fish and wildlife populations, land conservation, and visitor services are achieved.

Discussion: Implementation of this CCP will depend on adequate resources (i.e., funding, staff, equipment, facilities, and infrastructure) to follow through on objectives and strategies. In late summer 2005, St. Vincent NWR was merged with St. Marks NWR to create the North Florida NWR Complex. However, with the loss of 4 positions since 2003, the refuge has been challenged with adequately handling all necessary operations.

Objective 8.1: Personnel Management - Add an additional 6 full-time positions to the current refuge staff to achieve the refuge goals.

Discussion: Currently, St. Vincent NWR has 4 positions on the organizational chart consisting of a refuge manager, office assistant, forestry technician, and a biological science technician.

Strategies:

Tier 2:

- Add 6 permanent positions:
 - Assistant Manager (GS-7/9)
 - Wildlife Biologist (GS-9)
 - Maintenance Worker (WG-5)

-
- Complex Federal Wildlife Officer (GS-7/9)
 - Visitor Services Specialist (GS-7/9)
 - Boat Operator (WG-8)
 - Wildlife biologist Student Conservation Employment Program (SCEP) student (GS-5)
 - Explore Student Conservation Association (SCA) and AmeriCorps program opportunities.
 - Support the Youth Conservation Corps (YCC) program.

Objective 8.2: Partners - During the 15-year life of the CCP, continue to maintain and improve coordination and cooperation with governmental agencies, non-governmental agencies, community groups, businesses, and schools to support the needs of the refuge and the LCC.

Discussion: Partners play a key role in supporting the refuge's mission. St. Vincent NWR is part of a long-term partnership with the Apalachicola National Estuarine Research Reserve (ANERR) that started in 1979. St. Vincent NWR also maintains many other relationships with other governmental agencies, non-governmental agencies, community groups, businesses, and schools/universities/colleges.

Strategies:

Tier 1:

- Continue to operate with partners such as but not limited to ANERR, FWC, FFS, TNC, DEP, USDA Wildlife Services, USFS, and universities/colleges.
- Continue association with Apalachicola Regional Stewardship Alliance (ARSA).
- With partners, strive to promote SHC initiative, LCC concept, and global climate change management strategies.
- Work with partners to eradicate priority exotic and invasive species.

Tier 2:

- Coordinate with partners to survey, monitor, and study various wildlife species and their needs.
- Protect seagrass beds by partnering with agencies responsible for seagrass management.
- Work with partners to ensure that migratory bird objectives are being coordinated and achieved throughout the LCC.
- Work with partners to expand fire research related to effects on habitat and species.
- Seek new grant and partnership ideas

Objective 8.3: Property Management - Throughout the year, maintain, repair and/or replace facilities, equipment, and roads to provide safe and efficient operations to support the refuge goals.

Discussion: The refuge contact station/office is currently under a lease through GSA with the city of Apalachicola. The remaining facilities are on the 14 Mile site and St. Vincent Island. Most equipment is kept on St. Vincent Island.

Strategies:

Tier 1:

- Maintain SAMMS database.
- Maintain facilities and equipment on the refuge with support of St. Marks NWR resources.

Tier 2:

- Replace equipment as needed.
- Evaluate options for visitor contact station/office location.
- Maintain and enhance 14 Mile RV trailer campsite area to include the installation of concrete pads for all sites with a common, screened picnic pavilion.
- Within 5 years of the date of the final CCP, evaluate a proposed observation platform with interpretive panels, viewing scope, a restroom, trail, and kayak launch for 14 Mile site.
- Equipment needs would include a dump truck, small motor boat, and a jet dock.

V. Plan Implementation

INTRODUCTION

Refuge lands are managed as defined under the Improvement Act of 1997. 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 St. Vincent NWR, this section identifies projects, funding and personnel needs, volunteers, partnerships 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 objectives and strategies. The primary linkages of these projects to those planning elements are identified in each summary.

Project 1: Develop and Implement a Wildlife Monitoring Program

Monitoring wildlife and their habitats is an integral part of planning management actions and evaluating their effectiveness. Standardize monitoring for presence and distribution of rare, threatened, and endangered species, migratory and resident birds, native mammals, fish, reptiles, amphibians, native and non-native plants, and invertebrates. Conducting systematic monitoring based on focal species and structure-based indicators to determine the diversity of available habitats for priority wildlife species provides baseline data to assist managers in management practices. Included in these efforts would be the development of partnerships to conduct monitoring efforts to determine the potential impacts of climate change on the refuge. A full-time wildlife biologist would be employed to assist in implementing the monitoring program.

Linkages: Objectives: 1.1-2.10, 3.5-6, 5.1-2, 7.7-9, 8.1-2

Project 2: Habitat

The refuge contains a wide variety of habitats important to wildlife. This project would include restoration of hydrology with road removal and appropriate low water crossing and culvert placement, and conducting research and studies to monitor impact to key species. This project would improve beach and dunes by maintaining limited access to the beach, and managing downed trees on the beach. The habitat management plan would be updated and studies would be conducted on forest structure and large scale disturbances of vegetation. This project would also include conducting a Forest Habitat assessment on the refuge. An assistant manager and wildlife biologist position would be employed to assist with this project.

Linkages: Objectives: 1.2-2.10, 3.1-7, 5.1-2, 8.1

Project 3: Develop Geographic Information System (GIS)

This project would be developed to build and maintain databases containing wildlife resources, habitat management activities such as forestry and prescribed fire, cultural and historical resources, service facilities, infestations of invasive species, land use patterns on and off the refuge. This project would develop an up-to-date data management, storage, and retrieval system; obtain spatial information from appropriate sources; develop geographic layers for refuge management programs; and facilitate spatial analysis and creation of maps by the refuge staff. The system would be used for evaluation for land protection plans. Spatial analysis would allow the integration of wildlife census and surveys with habitat management treatments. This project would allow the evaluation of management treatments and potential effects of surrounding land use patterns and climate change.

Linkages: Objectives: 1.1-2.10, 3.1-7, 4.1-6, 5.2, 6.2-5, 7.2-5, 7.7, 7.10, 7.12, 8.1-2, 8.4

Project 4: Invasive and Exotic Species Control

The refuge's biological integrity is threatened by a variety of invasive species. This project would develop and implement an integrated pest management program (IPM) to control invasive and nuisance plants and animals. Some of the more common invasive species that create issues with habitat management are feral hogs, Japanese climbing fern, Chinese tallow, and cogon grass. A strategic program to identify, locate, and control nonnative and nuisance species is needed to effectively protect the resources on the refuge. The project would support an extensive invasive species survey, implementing program to prevent introduction of invasive plants, eradicating Chinese tallow populations, posting awareness signs, and removing feral hogs. An assistant manager position would be employed to assist meeting the objectives of this project.

Linkages: Objectives: 4.1-4.6, 5.1-2, 7.4, 7.7-9, 8.1, 8.4

Project 5: Fire Management for Wildlife Habitat

This project implements fire management to maintain and regenerate pine stands, scrub, and marsh habitats that support healthy wildlife populations. The project includes: annual updates of the fire management plan and subsequent prescribed fire prescriptions, preparation of burn units, burning the units, and post fire monitoring, developing a GIS data base, as well as maintaining training qualifications for staff. Additional resources are needed to implement shorter burn cycles and growing season prescribed fire. Fire would be used as a tool for managing invasive plants where appropriate. Fire staff from the North Florida NWR Complex would provide the bulk of the fire management staffing. Hiring an on-site boat operator and maintenance worker would provide the increased resources needed to accomplish this project.

Linkages: Objectives: 3.1-6, 4.1-5, 5.1-2, 7.4, 7.7, 8.1, 8.4

Project 6: Climate Change

Global climate change poses risks to human health and to terrestrial and aquatic ecosystems. This project would provide funding to work with research partners to assess the changes to refuge resources associated with climate change and evaluate the potential changes in habitat or species diversity that may be irreversible; potential refuge management activities that could mitigate or minimize the impact to refuge purposes; as well as strategies that can be implemented to assist key species in adapting to climate changes. This project would also support a study on long-term effects of sea level rise on the ecological communities of St. Vincent NWR.

Linkages: Objectives: 1.1, 5.1, 5.2, 7.4, 7.7-9, 8.1, 8.4

Project 7: Land Acquisition

The refuge has recently completed a MEP which allows for the potential purchase of lands up to 1,247 acres along Apalachicola Bay to support refuge management purposes. This project would support the purchase of a marina site at 11 Mile and restore the marina by dredging and rebuilding the sea wall with replacement of pilings and other structures for boat slips.

Linkages: Objectives: 6.3

Project 8: Improve Visitor Welcome and Orientation

This project would focus on improving welcoming and orientation of visitors to the refuge. This would include updating and adding signs, brochures, visitor facilities, and the website to meet current standards. Also, a station-specific video/DVD would be created, virtual tours of the refuge loaded on the website, regular media outreach and a visitor-services tear sheet map designed and produced. A new park ranger position supports this project and maintenance of the visitor services program.

Linkages: 2.9, 4.5, 5.1, 7.1-2, 7.7, 7.10-11

Project 9: Improve Environmental Education and Interpretation Programs

This project would increase opportunities for environmental education and interpretation on key resource issues that would include adding and upgrading kiosks, develop environmental education guidelines and policy for the public, create environmental education program outlines and/or lesson plans incorporating Florida Sunshine State Standards, complete education website sections, develop educator workshops, and evaluations to meet program objectives. The park ranger will support and maintain the program as well as train volunteers.

Linkages: Objectives: 7.4-5, 7.7-9, 7.12, 8.1, 8.4

Project 10: Expand Wildlife Observation and Photography Opportunities

This project would enable the refuge to expand wildlife observation and photography opportunities for visitors by establishing five key photo spots, evaluating the 14-mile site for a proposed observation platform and trail, hosting one photo class per year, and exploring expanding the non-motorized trails on the refuge. The park ranger will support and maintain the program.

Linkages: Objectives: 7.6, 7.12, 8.1, 8.3-4

Project 11: Expand the Volunteer, Friends Group, and Partner Programs

The project would strengthen the volunteer program on the refuge, expand involvement with the Supporters of the St. Vincent Island, Inc., and enhance existing partnerships and build new partners strategically to support the refuge mission. This would include establishing an annual volunteer training and recognition program, creating a volunteer management plan, performing background checks on volunteers as needed, expanding the RV campground, attending monthly Friends' meetings, coordinating project lists for Friends' support, and continue to enhance new and existing partners to accomplish the refuge mission. The park ranger position will support and maintain these programs as well as train volunteers.

Linkages: Objectives: 2.2, 5.1-2, 6.2, 6.5, 7.8-9, 8.2, 8.4

Project 12: Resource Protection

In recent years, cultural resource raiding, trespassing, easement violations, disturbance of sensitive wildlife areas, poaching and other inappropriate or illegal activities have increased due to the remoteness of the refuge and the lack of regular law enforcement patrols. The increased law enforcement presence of one full-time wildlife officer would result in improved visitor safety and services. Regular law enforcement patrols would deter vandalism, trespass, loitering, and other activities that disturb wildlife, and address law enforcement situations when they occur.

Linkages: Objectives: 6.1-5, 8.1, 8.3-4

Project 13: Cultural Resources

St. Vincent NWR lies in an area of rich history. The project would include conducting a refuge-wide cultural resource survey including Pig Island and the 14 Mile site. It would also provide for the protection of all known archaeological sites on the refuge from illegal take or damage, and establishing a refuge-wide cultural resource survey. This project would also promote educational awareness to the public as well as providing staff and volunteer opportunities to gain better understanding of laws and process of protecting archaeological sites.

Linkages: Objectives: 6.1-5, 7.8-9, 8.1, 8.3-4

Project 14: Facilities and Infrastructure

This project would include maintaining all facilities and equipment, replace equipment as needed, enhancing the 14 Mile RV trailer campsites and concrete pads for all sites, developing a visitor contact station on refuge lands, maintain roads. This project would include maintenance of five water control structures on St. Vincent Island. This would also include maintenance of the bridge over St. Vincent Creek. Equipment needs would include dump truck, small motor boat, and a jet dock. This project requires the hiring of one full time maintenance worker and boat operator to complete essential rehabilitation and maintenance work on the refuge to better meet the obligations of wildlife stewardship, habitat management, and visitor services.

Linkages: Objectives: 8.1-4

FUNDING AND PERSONNEL

Implementation of the CCP would require increased funding and personnel support that would come from a variety of internal and external sources. New projects and maintenance needs for existing facilities and projects are identified through the Service Asset Maintenance Management System (SAMMS). Figure 13 identifies the proposed St. Vincent NWR organization chart and staffing required to help achieve the goals, objectives, and strategies outlined in this CCP. Table 9 lists the proposed projects described above and their costs and associated staffing. The CCP, when final, would not constitute a commitment (from Congress) for staffing increases, operational and maintenance increases, or funding for future land acquisition, but represents wildlife resource needs based on sound biological science and input from the public.

Figure 13. Proposed organizational chart

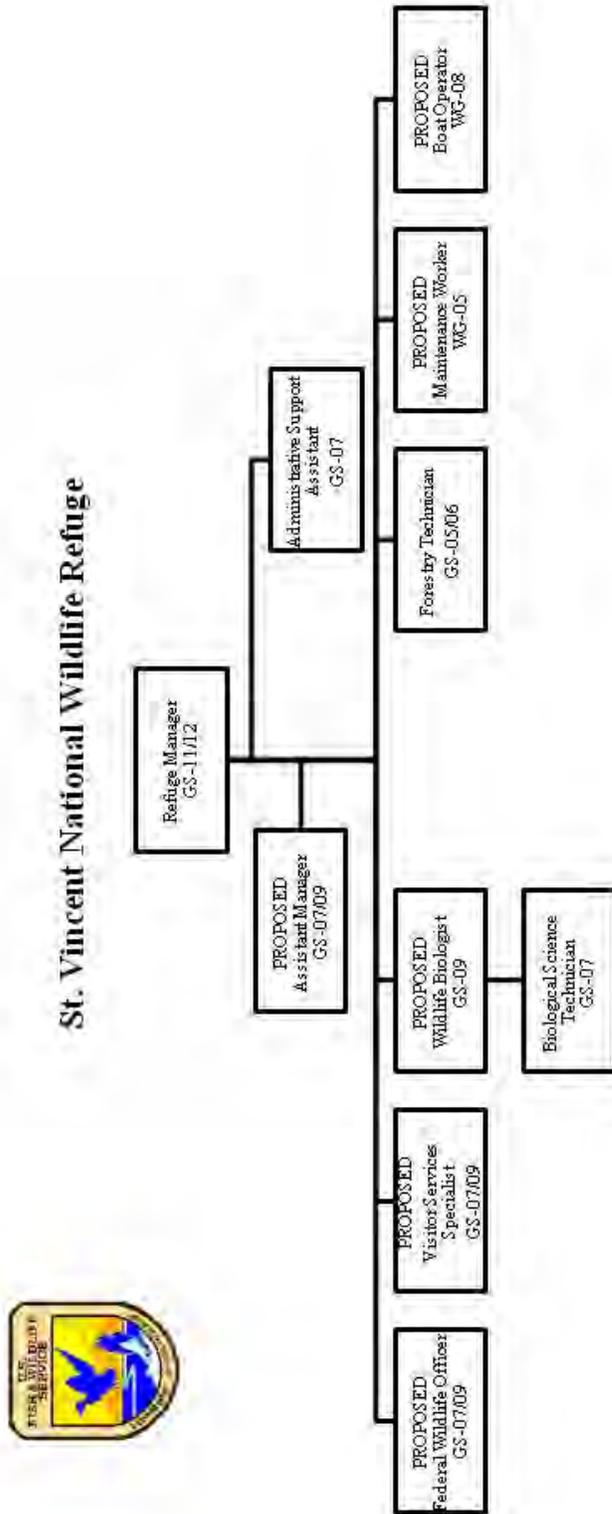


Table 8. Summary of projects

PROJECT NUMBER	PROJECT TITLE	FIRST YEAR COST	RECURRING ANNUAL COST	STAFF (FTE'S)
1	Develop and Implement a Wildlife Monitoring Program	180,000	116,000	1
2	Habitat	115,000	85,000	.75
3	Develop Geographic Information System (GIS)	45,000	5,000	Contract
4	Invasive and Exotic Species Control	200,000 20,000	10,000	Contract
5	Fire Management for Wildlife Habitat	130,000	130,000	.25
6	Climate Change	10,000	5,000	Contract
7	Land Acquisition	1,300,000		
8	Improve Visitor Welcome and Orientation	72,500	30,000	.25
9	Improve Environmental Education and Interpretation Programs	34,000	25,000	.25
10	Expand Wildlife Observation and Photography Opportunities	26,500	20,000	.25
11	Expand the Volunteer, Friends group, and Partner programs	21,500	25,000	.25
12	Resource Protection	112,500	112,500	.75
13	Cultural Resources	180,000	37,500	.25
14	Facilities and Infrastructure	400,000	180,000	2

PARTNERSHIP/VOLUNTEER OPPORTUNITIES

A key element of this comprehensive conservation plan is to establish partnerships with local volunteers, landowners, private organizations, and state and federal natural resource agencies. In the immediate vicinity of the refuge, opportunities exist to enhance partnerships with Franklin and Gulf Counties Commission, Franklin and Gulf Counties Tourist Development Council, Franklin and Gulf Counties Chamber of Commerce, and local landowners. At regional and state levels, partnerships may be established or enhanced with organizations, such as the Apalachicola Regional Stewardship Alliance, Apalachicola National Estuarine Research Reserve, Florida Fish and Wildlife Conservation Commission, Florida Forest Service, The Nature Conservancy, Florida Department of Environmental Protection, and universities.

STEP-DOWN MANAGEMENT PLANS

A CCP is a strategic plan that guides the direction of the refuge. A step-down management plan provides specific guidance on activities, such as habitat, fire, and visitor services. These plans (Table 10) are also developed in accordance with the National Environmental Policy Act, which requires the identification and evaluation of alternatives and public review and involvement prior to their implementation.

Table 8. Step-down management plans

Step-down Plan	Completion Date
Fire Management Plan	2012
Exotic, Invasive, Nuisance Control Plan	2014
Integrated Cultural Resources Plan	2014
Law Enforcement Plan	2014
Visitor Services Plan	2016
Habitat Management Plan	2017
Wildlife Inventory and Monitoring Plan	2018

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, inventory, 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 a Landscape Conservation

Cooperative group 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 comprehensive conservation plan will be revised. Specific monitoring and evaluation activities will be described in the step-down management plans.

PLAN REVIEW AND REVISION

The CCP, when final, 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 comprehensive conservation plan and the step-down management plans will be subject to public review and NEPA compliance.

SECTION B. ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

The Service prepared this EA for St. Vincent NWR in compliance with the NEPA and the 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 St. Vincent NWR's management actions and decisions over the next 15 years, provide understanding about the refuge and management activities, and incorporate information and suggestions from the public and refuge partners.

This Draft CCP/EA proposes a management direction, which is described in detail through a set of goals, objectives, and strategies. This 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 this 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 refuge. 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 this refuge.

This Draft CCP/EA 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 this EA is to meet the purpose(s) of the refuge and the goals identified in the CCP (for which we evaluate each alternative). The purpose of the CCP is to ensure that St. Vincent NWR conserves threatened and endangered species; protects fish and wildlife resources and natural diversity; conserves wetlands to meet migratory bird treaty obligations; addresses the spread and impacts of exotic, invasive, and nuisance species; investigates the impacts of climate change on refuge resources; promotes appropriate and compatible wildlife-dependent public use activities; promotes awareness and protection of natural resources; promotes support for refuge management activities, coordinating with a wide variety of government and non-government partners; protects and preserves archaeological and historical resources; and provides for appropriate and compatible scientific research.

This EA addresses the need to adopt a 15-year management plan for the St. Vincent NWR that provides guidance for future refuge management and meets the requirements 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 St. Vincent NWR. 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 refuge was 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

St. Vincent NWR was established in 1968 "...for use as an inviolate sanctuary, or any other management purpose, for migratory birds (16 U.S.C. 715D). "Management has been guided by the goals expressed in the statement of the refuge's mission: "To manage and preserve the natural barrier island and associated native plant and animal communities; provide resting, nesting, feeding and wintering habitat for waterfowl and other migratory birds; protect endangered and threatened species and their habitats; provide for biodiversity; and increase public opportunities for outdoor recreation and environmental education." The 12,490-acre refuge is located in Franklin and Gulf Counties, about 22 miles southwest of Apalachicola, Florida.

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 the National Environmental Policy Act of 1969. The refuge staff achieved compliance with the Improvement Act through the involvement of the public and the incorporation of an environmental assessment in this document, with a description of the alternatives considered and an analysis of the environmental consequences of the alternatives (Chapters III and IV in this section). When fully implemented, the CCP will strive to achieve the vision and purposes of St. Vincent NWR.

The Draft CCP/EA's overriding consideration is to carry out the purposes for which the refuge was established. The laws that established the refuge and provided the funds for acquisition state the purposes. 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 Improvement Act, 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.

In compliance with the Improvement Act, compatibility determinations have been completed and can be found in Appendix F.

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 this Draft CCP/EA for St. Vincent NWR. This Draft CCP/EA 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 St. Vincent NWR. 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 refuge.

Preplanning activities began on January 15, 2009. A wildlife and habitat management review was conducted in May 2000, followed by a Cultural Resources Review in May 2002 (updated 2009). A visitor services review was conducted in May 2009. Preplanning continued with information gathering and the identification of data gaps. A notice of intent (NOI) to prepare a comprehensive conservation plan for the refuge was published in the *Federal Register* on April 8, 2009.

On May 21, 2009, an intergovernmental scoping meeting was held at the Apalachicola National Estuarine Research Reserve office in Apalachicola, Florida. Eight intergovernmental partners attended and developed a list of priority issues.

Public scoping meetings were held on July 15, 2009, at St. Joseph Bay State Buffer Preserve in Port St. Joe, Florida. There were 28 public attending and six Service personnel. Another public scoping meeting was held on July 19, 2009, at Apalachicola Community Building in Apalachicola, Florida. At this meeting, 16 members of the public attended as well as six Service personnel.

A wide range of issues, concerns, and opportunities was identified and addressed during the planning process. All public and advisory team comments were considered; however, some issues that are important to the public are beyond the scope of the Service's authority and cannot be addressed within this planning process. The planning team did consider all issues that were raised throughout the planning process, and has developed a plan that attempts to balance the competing opinions regarding important issues.

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

II. Affected Environment

For a description of the affected environment, see 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 the refuge's purpose and vision, and the goals identified in the CCP; the priorities and goals of the Refuge System; and the mission of 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 refuge's 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 the 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 11.

DESCRIPTION OF ALTERNATIVES

Serving as a basis for each alternative, a number of goals and sets of objectives were developed to help achieve the 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 the refuge over a 15-year time frame while still meeting the refuge purposes and goals. The three alternatives are summarized below. A comparison of each alternative follows the general description.

ALTERNATIVE A (CURRENT MANAGEMENT - NO ACTION)

This alternative represents "status quo". Under this alternative, there would be no new actions taken to improve or enhance the refuge's current habitat, wildlife and public use management programs. Species of federal responsibility, such as threatened and endangered species and migratory birds, would continue to be monitored at present levels. Additional species monitoring would occur as opportunistic events when contacts outside the refuge staff offer support. Current habitat management including prescribed fire and hydrological restoration would continue when outside resources are available to help refuge staff. Management of exotic, invasive, and nuisance animal and plant species would continue to be opportunistic. All public use programs of hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation would continue at present levels.

Acquisition of lands into the refuge would occur when funding is appropriated and willing sellers are interested in selling lands that are necessary for refuge operations and/or critical habitats for sensitive species. Staff would consist of a manager, office assistant, forestry technician, and a biological science technician, along with supplementary support from the remainder of the North Florida NWR Complex staff when available, as well as support from volunteers and partners.

ALTERNATIVE B

The focus on Alternative B is to emphasize the natural and primitive processes while still adhering to policy, mandates, and mission of the Service and the refuge. The refuge would continue to support actions necessary to protect and manage for species of federal responsibility, such as threatened and endangered species and migratory birds. Additional key species would be monitored as the refuge transitions into a more natural and primitive environment.

There would be an aggressive attempt to restore the hydrology to natural conditions with the removal of additional roads on St. Vincent Island. All water control structures including the impoundment system on St. Vincent Island would be open to allow natural flow of water to and from the bay and the Gulf. Under this alternative, prescribed burning would be discontinued on St. Vincent Island and allow natural fire events to occur unless human life or property is involved. Since the purchase of the refuge there has been minimal emphasis on timber condition, so a forest habitat assessment would be conducted on refuge lands. The eradication of exotic species (i.e., feral hogs and sambar deer) would be a key component to this alternative.

Wildlife-dependent recreational uses would continue with some major changes. The hunt program would only consist of a quality white-tailed deer and raccoon hunt (sambar deer and feral hogs would be phased out as eradication of these species occur). As this alternative focuses on natural and primitive processes, camping during hunts would be discontinued and self check in stations would be installed. The fishing opportunities would be based on natural processes since restocking of freshwater fish would be discontinued. Wildlife observation, photography, and environmental education and interpretation would continue to focus on a natural and primitive process with a discontinuation of vehicle tours.

The refuge would continue to maintain and build relations with partners, volunteers, and the friends group as it relates to managing the resource, supporting the SHC initiative, and the LCC. There would continue to be a need for research and studies on the refuge to gain a better understanding of the resource and the changes occurring from environmental and human events.

The refuge would be staffed at current levels plus an assistant manager, a wildlife biologist, a maintenance worker, and a federal wildlife officer.

ALTERNATIVE C (PROPOSED ALTERNATIVE)

This alternative expands Alternative A with an increased effort to manage and protect the refuges native and imperiled species. With this alternative the refuge would continue to survey and monitor species of federal responsibility, such as threatened and endangered species and migratory birds, and key native species but would also gain a better understanding of native species not currently identified by the refuge. Additional efforts would be made to protect and support nesting opportunities for key species, as well as gain a better understanding of population dynamics of some species. There would be evaluations to determine if it is suitable to reestablish populations of eastern indigo snake, gopher tortoise, and eastern wild turkey to St. Vincent Island.

The refuge would continue to manage Lakes 1, 2, and 3 with seasonal draw downs to support the needs of shorebirds and wading birds. Lakes 4 and 5 would continue to support deep water for a freshwater fisheries program with occasional draw down to manage the vegetation within the system. Since the purchase of the refuge there has been minimal emphasis on timber condition, so a forest habitat assessment would be conducted on refuge lands. The management of exotic, invasive, and nuisance animal and plants would be a focus, with an emphasis on aggressively eradicating feral hogs.

Wildlife-dependent recreational uses of the refuge would be expanded. The hunt program would consist of a white-tailed deer, raccoon, and sambar deer hunt (hog hunting would be phased out as population is eradicated). Fishing would consist of saltwater and freshwater opportunities. Wildlife observation, photography, and environmental education and interpretation would be enhanced to focus on imperiled species, the unique barrier island history and ecosystem as it relates to the coastal environment, and management style incorporating climate change effects. The refuge would enhance the environmental education program to incorporate Florida Sunshine Standards while establishing guidelines for public programs. Vehicle tours that meet management objectives would continue as long as staff can support the program. The refuge would be staffed at current levels plus an assistant manager, a wildlife biologist, a maintenance worker, a federal wildlife officer, a visitor services specialist, and a boat operator. Under this alternative the refuge would hire a wildlife biologist SCEP student, continue the YCC program, and explore SCA and AmeriCorps program opportunities.

Even with an increased staffing the refuge would continue to support the need for volunteer assistance as well as the need to build stronger relations with the friends group and partners as it relates to managing the resource, supporting the SHC initiative, and the LCC. As climate change affects the refuge, increased research and studies would need to be conducted to continue to understand the species and habitat changes to support the best management decisions through adaptive management.

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.

- Imperiled species - Each alternative would provide protective conservation measures for federally listed species and their habitats on the refuge.
- Migratory birds - The refuge would support the need to survey, monitor, and protect migratory birds.
- Control feral hogs - Each alternative seeks to attempt to eradicate the population of feral hogs from St. Vincent Island.
- Management plans - Each alternative includes the development and implementation of a habitat management plan and a visitor services plan.
- Hydrology restoration - Throughout each alternative the need to restore the hydrology of St. Vincent Island is a focus.
- Oyster Pond - The water management of oyster pond would continue to stay as a natural process.
- Maintain capitalized equipment - All alternatives contain maintenance of refuge equipment, which is required to meet safety standards.
- Law Enforcement - Each alternative recognizes the need to protect the refuge resources and visitors.

-
- Partnerships - Currently established partnership with agencies, organizations, and individuals would continue to support refuge management programs.
 - Research opportunities - To gain a better understanding of the refuge resources and habitats there would continue to be a need to study and monitor refuge lands.

COMPARISON OF THE ALTERNATIVES BY ISSUE

Table 9. Comparison of alternative by management issues for St. Vincent NWR

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Goal 1: Fish and Wildlife Population Management - Protect, maintain, enhance, and restore healthy and viable populations of migratory birds, resident wildlife, and fish.			
Land Birds	Annually conduct bird surveys (i.e., BBS, Christmas Bird Counts). Coordinate with partners to perform research studies.	Expand Alternative A. Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.	Expand Alternative B. Evaluate the potential to reintroduce eastern wild turkey.
Raptors	Annually ground monitor active bald eagle nests while partnering with FWC for aerial surveys. Record any new nests. Maintain bald eagle seasonal closure boundaries. Annually conduct bird surveys (i.e., BBS, Christmas Bird Counts). Coordinate with partners to perform surveys and research studies.	Expand Alternative A. Annually partner with FWC to conduct aerial surveys for bald eagles. Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.	Expand Alternative B. Install barn owl nest boxes at boathouse.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Shorebirds, Wading Birds & Marshbirds	<p>Seasonally protect sensitive nest sites (i.e. located at Indian Pass & Oyster Pond) from human disturbance.</p> <p>Protect active rookeries from human disturbance.</p> <p>Annually conduct bird surveys (i.e., BBS, Christmas Bird Counts).</p> <p>Coordinate with partners to perform research studies.</p>	<p>Expand Alternative A.</p> <p>Monitor and document change in known rookeries and note new rookeries.</p> <p>Seasonally close and monitor Tahiti Beach for protection of least tern nests.</p> <p>Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative B.</p> <p>Expand surveys of beaches for shorebird nesting and protect nest sites.</p> <p>Participate in international Shorebird Survey program.</p> <p>Predator control in and around bird nest sites.</p> <p>Further study/monitor seaside sparrow and fire relationship.</p>
Waterfowl	<p>Annually maintain and monitor wood duck boxes.</p> <p>Partner with FWC to support wood duck banding quotas for state.</p> <p>Monitor for Avian Influenza.</p> <p>Annually conduct bird surveys (i.e., BBS, Christmas Bird Counts).</p> <p>Coordinate with partners to perform research studies.</p>	<p>Phase out wood duck box program.</p> <p>Annually conduct bird surveys (i.e., BBS, Christmas bird counts).</p> <p>Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative A.</p> <p>Maintain 40 refuge wood duck boxes to support populations. Evaluate population and production trends.</p> <p>Explore opportunities with the Service Flyway Biologist to conduct mid-winter aerial waterfowl surveys</p> <p>Establish ground and boat survey routes. Conduct monthly survey routes during November – March.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Native Mammals	<p>Perform occasional white-tailed deer herd health checks with SCWDS.</p> <p>Collect deer data through hunter check stations during managed hunts.</p> <p>Maintain current deer hunting program.</p> <p>Report marine strandings on refuge.</p> <p>Work to exclude bats from the cabin.</p> <p>Coordinate with partners to perform research studies.</p>	<p>Expand Alternative A.</p> <p>Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative B.</p> <p>Conduct baseline mammal surveys and compare to past surveys.</p> <p>Evaluate the use of the current artificial bat roost sites and investigate the need for additional artificial bat roost sites. Continue to work with the Florida Bat Conservancy to survey and identify bat species throughout refuge.</p>
Freshwater Fish	<p>Restock as needed to maintain quality fisheries, in Lakes 4, & 5 with bass and bluegill (hand-painted bream).</p> <p>Annually survey and monitor Lakes 1-5 and Oyster Pond to detect changes in fish populations while maintaining a database.</p>	<p>Discontinue the restocking of fish in Lakes 4 and 5.</p> <p>Water control structures throughout St. Vincent Island will be open allowing natural process to occur.</p>	<p>Expand Alternative A.</p> <p>Update fish management plan in coordination with FWC.</p> <p>Evaluate stocking native brackish species such as redfish to provide additional sportfishing opportunities in impoundments not managed as freshwater habitats.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Reptiles & Amphibians	Annually coordinate with partners to survey and monitor species.	Expand Alternative A. Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.	Expand Alternative B. Evaluate and monitor the eastern diamondback rattlesnake population on St. Vincent Island. Work with universities to gain a better understanding of reptiles and amphibians and their needs on St. Vincent Island.
Invertebrates	No active management.	Survey and monitor to detect changes in key species as they relate to restoration projects while maintaining a database.	Baseline evaluation of invertebrates with emphasis on pollinators and other key insects. Initiate a monarch butterfly tagging and monitoring program with volunteers.
Wildlife Inventory and Monitoring Plan	Operating under a plan created in 1986.	Develop Wildlife Inventory and Monitoring Plan.	Develop Wildlife Inventory and Monitoring Plan.
Goal 2: Rare, Threatened and Endangered Species - Promote the recovery of rare, threatened, and endangered plants and animals.			
Red Wolf	Monitor and maintain a pack (adult pair and 2 consecutive pup litters) of wolves on St. Vincent Island to support recovery program at Alligator River NWR.	Same as Alternative A.	Expand Alternative A. Conduct a food habit study.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
<p>Sea Turtles (Loggerhead, Green, Leatherback, and Kemp’s Ridley)</p>	<p>Conduct 5-7 surveys per week from May- September. Survey as needed in October and November. Completion of surveys dependent upon volunteers and partners.</p> <p>Evaluate nest for hatchling success rates.</p> <p>Partner with FWC to record nests, species and success rates.</p> <p>Cage all confirmed nests to reduce depredation.</p> <p>Target nest depredation issues with monitoring, targeted trapping and humane euthanization of nuisance animals.</p> <p>Restrict staff beach driving and reduce speeds to 10 mph.</p>	<p>Conduct 5-7 surveys per week from May- September. Survey as needed in October and November. Completion of surveys dependent upon volunteers and partners.</p> <p>Evaluate nest for hatchling success rates.</p> <p>Partner with FWC to record nests, species and success rates.</p> <p>Aggressively control feral hog populations.</p> <p>Survey and monitor to detect changes in species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative A.</p> <p>Conduct 7 surveys per week.</p> <p>Evaluate data to determine habitats and nest locations.</p> <p>Maintain the Refuge website with annual nest information.</p> <p>Coordinate with FWC and University of Florida to rescue cold-stunned sea turtles near Pig Island</p> <p>Implement a monofilament recovery and recycling program.</p> <p>Work with FWC to post signs regarding sea turtles and safe fishing practices.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Wood Stork	<p>Incidental sightings recorded.</p> <p>Continue water level management.</p>	<p>Incidental sightings recorded.</p> <p>Open water control structures.</p> <p>Survey and monitor to detect changes in species as they relate to restoration projects while maintaining a database.</p>	<p>Incidental sightings recorded.</p> <p>Annually conduct spring and fall population surveys.</p> <p>Seasonal water management.</p>
Snowy Plover	<p>Support nest surveys with partners.</p> <p>Support nest protection areas with partners.</p> <p>Participate in Christmas Bird Counts and population surveys.</p> <p>Restrict staff and volunteer beach driving and reduce speeds to 10 mph.</p>	<p>Expand Alternative A.</p> <p>Survey and monitor to detect changes in species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative A.</p> <p>Support research studies to gather habitat and population information.</p> <p>Conduct surveys during nesting season to determine need to modify or expand nesting closure areas.</p> <p>Ensure operation consistent with the Florida Fish and Wildlife Conservation Commission's guidelines for operating vehicles on the beach.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Piping Plover	<p>Protect designated critical habitat areas for wintering piping plovers.</p> <p>Participate in annual Christmas Bird Counts.</p> <p>Support population and habitat studies with partners.</p> <p>Monitor piping plover during the international shorebird survey</p> <p>Restrict staff beach driving and reduce speeds to 10 mph.</p>	<p>Expand Alternative A.</p> <p>Survey and monitor to detect changes in species as they relate to restoration projects while maintaining a database.</p>	<p>Expand Alternative A.</p> <p>Support International Piping Plover Census program.</p> <p>Seasonally close beach and mudflats areas where species is occurring.</p> <p>Restrict staff beach driving and ensure operation consistent with the Florida Fish and Wildlife Conservation Commission's guidelines for operating vehicles on the beach.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Gopher tortoise	<p>Conduct periodic evaluations of gopher tortoise burrows for activity.</p> <p>Support research to better understand gopher tortoises on St. Vincent island.</p> <p>Burn habitat on a two to four year rotation.</p> <p>Continue closure of tortoise use areas to disturbance with heavy equipment.</p>	<p>Expand Alternative A.</p> <p>Aggressively control feral hog and fire ant populations.</p>	<p>Expand Alternative A.</p> <p>Aggressively control feral hog and raccoon populations.</p> <p>Evaluate the potential for stocking of species on the island.</p> <p>Study population dynamics and status. Determine 10-year population trends.</p> <p>Expand the use of warm season fire in management units adjacent to existing use areas to accommodate the expanding population.</p>
Eastern Indigo Snake	<p>No individuals sighted on the refuge in recent years.</p> <p>Support surveys conducted by researchers.</p> <p>No current active management.</p>	<p>Expand Alternative A.</p> <p>Evaluate the potential to reintroduce species on the island.</p> <p>Aggressively control feral hog populations.</p>	<p>Same as Alternative B.</p> <p>Aggressively control feral hog and raccoon populations.</p>
Florida Manatee	<p>No current Management</p>	<p>Post awareness signs.</p>	<p>Same as Alternative B.</p>
Gulf Sturgeon	<p>Partner with the Service and other agencies to support research needs for recovery of species.</p>	<p>Expand Alternative A.</p> <p>Post awareness signs.</p>	<p>Same as Alternative B.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
State-listed plants	No current management.	Partner with agencies and universities to gather additional knowledge of populations and locations.	Expand Alternative B. Survey 14 Mile and Pig Island for sensitive plants. Determine management needs of each species on St. Vincent Island and provide protection.
Goal 3: Habitat Management - Protect, maintain, enhance, and restore suitable habitat for the conservation and management of migratory birds, resident wildlife, fish, and native plants, including all rare, threatened and endangered species.			
Marsh (Salt & freshwater)	Conduct two-year rotational burns in alternating years on the area north of Big Bayou and Mallard Slough. Restoration of hydrology with road removal and appropriate low water crossing and culvert placement.	Reduce road system to 10-20 miles to support only necessary management. Continue restoration of hydrology with road removal and appropriate low water crossing and culvert placement. Conduct research and studies to monitor impact to key species.	Expand Alternative A. Conduct research and studies to monitor impact to key species.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Open Water (including impoundments)	<p>Periodically monitor water quality and water levels.</p> <p>Manage Lakes 1, 2, and 3 with seasonal draw downs (March-May) for shorebird, wading birds and migrating waterfowl.</p> <p>Manage Lakes 4 and 5 as deep water to provide a public fishing opportunity.</p> <p>Manage Oyster Pond as a natural system.</p>	<p>Open water control structures to allow natural flows.</p> <p>Periodically monitor water quality and water levels.</p> <p>Protect seagrass beds by partnering with agencies responsible for seagrass management.</p>	<p>Monthly monitor water quality and water levels with more intense monitoring during seasonal draw downs.</p> <p>Continue to manage Lakes 1, 2, and 3 with seasonal draw downs to support moist soil conditions, shorebirds, wading birds and habitat for migrating and wintering waterfowl.</p> <p>Manage Lakes 4 and 5 as deep water with periodic drawdowns as prescribed in the step-down Habitat Management Plan.</p> <p>Continue to manage Oyster pond as a natural system.</p> <p>Annual summer (July-August) evaluation of vegetation to determine need to control nuisance species. Monitor the trends in open water at least every 10 years.</p> <p>Protect seagrass beds by partnering with agencies responsible for seagrass management.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Beach & Dunes	<p>Maintain limited access to beach from island interior to reduce dune deterioration avoiding areas of dune development.</p> <p>Restrict staff beach driving to UTV type vehicles for essential management and reduce speeds to 10 mph.</p> <p>Manage downed trees on beach with chainsaws only.</p> <p>Patrol beach to reduce litter damaging the resource.</p>	<p>No management of downed trees on beach.</p> <p>Restrict beach driving to UTVs only for essential management and reduce speeds to 10 mph.</p> <p>Patrol beach to reduce litter damaging the resource.</p>	Same as Alternative A.
Roads - restoration	<p>Restore approximately 45 miles of previously closed roads to allow natural flow of water.</p> <p>Improve hydrology around existing roads (approximately 45 miles) with installation of low water crossings and appropriate sized culverts.</p>	<p>Reduce road system to 10-20 miles to support only necessary management.</p> <p>Continue restoration of hydrology with road removal and appropriate low water crossing and culverts.</p>	<p>Expand Alternative A.</p> <p>Continue restoration of hydrology with road removal and appropriate low water crossings and culverts.</p> <p>Evaluate road system to determine need for additional surface improvements.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Forest Management	No current management.	<p>Conduct forest habitat assessment for St. Vincent Island and 14 Mile site.</p> <p>Update forest management plan.</p> <p>Determine future desired condition by studying historical vegetation patterns on the refuge and develop management options.</p>	<p>Expand Alternative B.</p> <p>Develop historical vegetation maps and investigate changes in vegetation over time.</p> <p>Conduct an analysis of large scale disturbances (e.g., hurricanes, wildfires) on vegetation structure.</p> <p>Establish long term demographic studies of forest structure.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Fire Management	<p>Operate under fire management plan and prescribed fire monitoring plan prepared in 2010. Annually write prescriptions for current years proposed burns.</p> <p>Manage and maintain current fire management programs to achieve healthy and viable wildlife and plants on the refuge and reduce fuels on St. Vincent Island and 14 Mile site.</p> <p>No current management on Pig Island.</p> <p>Annually prescribe burn 3,000-5,000 acres.</p> <p>Burn on 2 and 4 year rotations of the 15 burn units focusing on warm season burns.</p>	<p>Modify fire management plan prepared in 2010 to reflect the change in prescribed burn program.</p> <p>On St. Vincent and Pig Islands, allow wildfires to burn with minimal suppression. Monitor fires and take action only to prevent loss of human life or property.</p> <p>Phase out prescribed burn program on St. Vincent Island once fuels loads have been decreased and allow natural process to occur.</p> <p>At 14 Mile site continue to prescribe burn to maintain habitats.</p> <p>Establish fuels monitoring program.</p> <p>Monitor wildfire effects on the islands.</p> <p>At 14 Mile site expand fire research on effects on habitat and species.</p>	<p>Operate under the fire management plan and prescribed fire monitoring plan prepared in 2010. Annually write prescriptions for current years proposed burns.</p> <p>Continue prescribed fire program using the current 15 burn units for St. Vincent Island and 14 Mile site. Wildfire will be contained at burn unit boundaries. Prescribed burn 3,000-5,000 acres per year, with 30%-50% growing season.</p> <p>Monitor fires on Pig Island.</p> <p>Enhance habitat for species of concern, targeted species, and species of federal responsibility.</p> <p>Establish fuels monitoring program.</p> <p>Continue to study/monitor seaside sparrow and fire relationships.</p> <p>Expand fire monitoring to study effects on habitat and species.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Habitat Management Plan	Complete annual habitat work plan (AHWP). Develop and implement a habitat management plan within 5 years of CCP completion.	Same as Alternative A.	Same as Alternative A.
Goal 4: Exotic, Invasive, and Nuisance Species - Manage exotic, invasive, and nuisance species on the refuge to maintain and enhance the biological integrity of refuge habitats.			
Control of Feral Hogs	Feral hogs are removed opportunistically by refuge staff and limited harvest during existing refuge public deer hunts.	Aggressive attempt to eradicate over the next 10 years. Conduct public outreach and educational programs.	Same as Alternative B.
Control of Sambar deer	Manage public hunt to maintain a herd population of 75-100.	Aggressive attempt to eradicate over the next 10 years. Conduct public outreach and educational programs.	Expand Alternative A. Evaluate partnering with the Service to conduct population surveys.
Control of Coyotes	Survey and remove any known coyotes on St. Vincent Island.	Same as A.	Same as A.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Control of other exotic, invasive and nuisance animals	<p>Monitor refuge and document signs of new or increased populations of exotic, invasive and nuisance animals.</p> <p>Aggressively control, and remove as appropriate any exotic, invasive and nuisance species.</p>	<p>Monitor refuge and document signs of new or increased populations of exotic, invasive and nuisance animals.</p> <p>Aggressively control, and remove as appropriate any exotic, invasive and nuisance species.</p>	Same as Alternative A.
Control of exotic, invasive and nuisance terrestrial plants	<p>Opportunistically monitor old invasive sites (climbing fern, cogon grass, Chinese tallow) for reoccurrence of species and treat as necessary.</p> <p>Monitor refuge and document signs of new or increased populations of exotic, invasive and nuisance terrestrial plant.</p> <p>Aggressively control and remove as appropriate any exotic, invasive and nuisance species.</p>	<p>Annually monitor and maintain database of exotic plants on the refuge.</p> <p>Aggressively control and remove as appropriate any exotic, invasive and nuisance species.</p>	<p>Annually monitor and maintain database of exotic, invasive, and nuisance plants on the refuge.</p> <p>Aggressively control and remove as appropriate any exotic, invasive and nuisance species.</p> <p>Develop a treatment plan to chemically and mechanically manage exotic, invasive, and nuisance plants.</p> <p>Implement program to prevent introductions of invasive exotic plants via equipment transported to the refuge.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Control of exotic, invasive and nuisance aquatic plants	No current management.	Annually monitor and maintain database of exotic aquatic plants on the refuge. Remove all exotic species from the refuge.	Manage Lakes 4 & 5 to limit the coverage of aquatic vegetation to no more than 25%. Conduct a study to determine species of <i>Phragmites</i> and determine control needs. Annually monitor and maintain database of exotic, invasive, and nuisance aquatic plants on the refuge. Develop a management plan to control and eradicate exotic, invasive, and nuisance plants.
Exotic, Invasive, and Nuisance Species Control Plan	Operating under plan created in 1993.	Update plan.	Same as Alternative B.
Goal 5: Climate Change - Adapt management consistent with the best available scientific projections regarding environmental changes in order to protect refuge resources.			
Outreach & Education	Opportunistically share knowledge on climate change. Staff continues to gain understanding and knowledge of the key issues related to climate change.	Expand Alternative A. As science, technology, and policy evolve, become more aggressive at educating partners and the public the Service direction on climate change.	Same as Alternative B.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Research & Monitoring	No current management Completed Sea Level Affecting Marshes Model (SLAMM) study.	Increase information and research to enable adaptive management to cope with long-term climate change impacts.	<p>Prioritize climate change impacts to rare, threatened, and endangered species. Coordinate with partners to monitor changes in salinity levels, associated vegetation species, and wildlife species.</p> <p>Coordinate with partners to establish benchmarks to measure sea level rise.</p> <p>As new information is available reevaluate the future status of research on refuge lands.</p> <p>Adapt management as necessary.</p>
Goal 6: Resource Management and Protection - Maintain, preserve and protect archaeological, cultural, historic, and natural resources representing the natural and cultural history of the local area.			
Provide visitor safety, protect resources and ensure public compliance with refuge regulations	Periodic law enforcement provided by St. Marks NWR LE Staff.	<p>Evaluate the amount of need for law enforcement and determine how to handle emergency issues.</p> <p>Seek a complex Federal Wildlife Officer position with primary duty station at St. Vincent to split time with the complex.</p> <p>Seek partnerships with other agencies to support local area law enforcement.</p>	Same as Alternative B.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
<p>Archaeological and Historical site protection</p>	<p>Conduct archaeological surveys as opportunity arises.</p> <p>Develop partnerships to aid in the management of the refuge cultural resources.</p> <p>Actively consult with regional archaeologist.</p> <p>Protect all known archaeological sites on the refuge from illegal take or damage in compliance with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act and the National Historic Preservation Act.</p>	<p>Expand Alternative A.</p> <p>Conduct a refuge-wide cultural resource survey.</p> <p>Promote educational awareness to the public by providing an understanding and appreciation of the refuge's ecology and the human influence on the region's ecosystems.</p>	<p>Expand Alternative B.</p> <p>Develop a GIS layer for the refuge cultural resources sites.</p> <p>Evaluate consulting an archaeological firm to generate a one-foot topographic contour map and conduct a remote sensing archaeological survey of the Fort Mallory site to better understand the extent of the fortification.</p> <p>Procure pertinent scientific reports and articles and produce an annotated bibliography to document the region's history, geomorphology, and the utility of the scientific methodology.</p> <p>Evaluate the effects of fire management activities on cultural resources in the vicinity of those activities and modify activities so they will not disturb cultural resources.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Land Acquisition	A Minor Expansion Plan (MEP) was approved in 2010 for 1,247 acres.	<p>Seek opportunities to acquire lands from willing sellers identified in the MEP.</p> <p>Support State land acquisition program with SHC initiative and LCC.</p> <p>Determine relationship with State on the management of Flag Island/Bird Island.</p>	Same as Alternative B.
FSA conservation easements	<p>Occasional law enforcement checks.</p> <p>Respond to landowner request.</p>	<p>Annually check all 21 easements.</p> <p>Partner with FWC to write management plans</p> <p>Manage easements to the SHC initiative /LCC concept.</p>	Same as Alternative B.
Goal 7: Visitor Services - Promote an understanding and appreciation of fish and wildlife resources and provide the public with quality and safe outdoor education and recreation experiences that are compatible with natural resource conservation and the primitive-use concept of the refuge.			

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Welcome and Orient	<p>Maintain the public contact station in Apalachicola.</p> <p>Continue to provide visitors with updated informational brochures about the refuge.</p> <p>Maintain and replace directional, entrance, boundary and regulatory signage as needed.</p> <p>Maintain current visitor information on refuge web site regarding programs and facilities.</p> <p>Annually evaluate and maintain existing kiosks and panels.</p>	Same as Alternative A.	<p>Expand Alternative A.</p> <p>Install public use informational signage at needed locations on the refuge.</p> <p>Evaluate options for visitor contact station/office location with future desire to develop visitor contact station/office on refuge lands.</p> <p>Develop a site and use plan for 14 Mile site.</p> <p>Monthly update current visitor information on refuge web site regarding programs and facilities.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Hunting	<p>Operate with current hunt plan.</p> <p>Provide three permitted hunts (archery and primitive weapons for white-tailed deer, hogs, raccoons, and a lottery sambar deer primitive hunt including hogs and raccoons). Due to logistics and safety issues, hunters are permitted to camp in 2 designated areas (West Pass and Indian Pass) during white-tailed deer hunts and 1 area (West Pass) for sambar deer.</p> <p>Annually review and edit 50 CFR for regulation changes to hunting program.</p> <p>Provide public annual information on hunting opportunities.</p> <p>Waterfowl hunting is not allowed.</p>	<p>Develop an evaluation to determine the effectiveness of the hunt program and complete an updated hunt plan.</p> <p>Hunt program will only support a quality white-tailed deer herd. Sambar deer hunt phased out as the species is eliminated. Attempt to eradicate hogs over the next 10 years reducing hog hunt opportunities.</p> <p>Minimize staff and resource involvement during hunts (hunts would discontinue camping opportunities, game harvest support, etc.) and install self check stations on the mainland.</p> <p>Survey and monitor to detect changes in white-tailed deer populations while maintaining a database.</p> <p>Annually review and edit 50 CFR for regulation changes to hunting program.</p>	<p>Expand Alternative A.</p> <p>Attempt to eradicate hogs over the next 10 years reducing hog hunt opportunities.</p> <p>Develop an evaluation to determine the effectiveness of the hunt program and complete an updated hunt plan.</p> <p>Immediately determine the need to create additional hunting informational signs to help hunters understand the hunt process.</p> <p>Work with FWC to re-evaluate (with historic data) and determine carrying capacity of hunters as to determine the number of permits to be issued to the hunters.</p> <p>Partner to conduct population surveys of game species.</p> <p>Survey and monitor to detect changes in white-tailed deer populations while maintaining a database.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Fishing	<p>Bank fishing allowed year round in Lakes 1, 2, 3, 4, 5 & Oyster Pond. Boating with no gas motors.</p> <p>Restocking of native freshwater species in Lakes 4 and 5 as necessary.</p> <p>Crabbing and oystering is allowed in accordance with state regulations year round from Oyster Pond water control structure to the Gulf and the St. Vincent Creek bridge to the Bay.</p> <p>Annually survey and monitor to detect changes in fish populations while maintaining a database.</p> <p>Provide annual public awareness of various fishery related activities including opening and closing fishing dates.</p> <p>Annually review and edit 50 CFR for regulation changes to fishing program.</p>	<p>Expand Alternative A.</p> <p>With no restocking of freshwater fish, opportunity for fishing will be based on natural process.</p> <p>Institute self check program for anglers catch in island lakes.</p> <p>Conduct a contaminate study in the lakes to determine quality of fish health.</p> <p>Non-lead weights required in all refuge waters.</p>	<p>Expand Alternative A.</p> <p>Update fishing brochure to include new fishing regulations and include labeling of lakes and open dates for fishing.</p> <p>Explore opportunities to partner with at least two other agencies/groups to educate children and adults about fishing.</p> <p>Conduct a contaminate study in the lakes to determine quality of fish health.</p> <p>Institute self check program for anglers catch in island lakes.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Environmental Education	<p>Provide programs for schools by request to focus on environment education programs related to imperiled species and the unique barrier island ecosystem and history.</p> <p>With support of St. Marks NWR staff, continue to work with partners (schools, governmental agencies and non-governmental agencies) to build stronger relationships to educate local students about natural resources.</p> <p>Support the assistance of volunteers in the environmental education program by providing them with tools and training to be successful educators.</p>	<p>Expand Alternative A.</p> <p>Include programs on and off refuge geared to the natural and primitive processes.</p> <p>Establish a protocol and requirements for environmental education volunteers. Conduct annual refresher trainings.</p> <p>Complete environmental education sections of website and maintain weekly update.</p> <p>Work with partners to develop educator workshops and implement for targeted number of educators.</p>	<p>Focus on environment education programs on and off refuge related to imperiled species and the unique barrier island history and ecosystem as it relates to the coastal environment, and management style incorporating climate change effects.</p> <p>Develop environmental program guidelines. Enhance environmental education program outlines and/or lesson plans incorporating Florida Sunshine State Standards.</p> <p>Work with partners to build stronger relationships to educate local students about natural resources. Establish a protocol and requirements for environmental education volunteers. Conduct annual refresher trainings.</p> <p>Complete environmental education sections of website and maintain monthly updates. Develop an evaluation to determine the effectiveness of the environmental education program.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Interpretation	<p>Maintain current limited interpretive opportunities, primarily non-personal interpretation (panels, kiosks).</p> <p>Key messages are sea turtles, red wolves, importance of the island to the estuary system, migratory birds, NWRS, history, and fire.</p>	<p>Key messages will now focus on natural and primitive processes include new key messages on global climate change, SHC initiative, and LCC with on and off site programs.</p> <p>Complete interpretation opportunities of website and maintain monthly update.</p> <p>Create station specific video and virtual tours of the refuge as needed.</p> <p>Discontinue vehicle tours of island.</p>	<p>Focus interpretation to relate to imperiled species and the unique barrier island ecosystem and history while including new key messages on global climate change, SHC initiative, and LCC with on and off site programs.</p> <p>Create 3-5 new interpretive panels to address the key interpretive message (imperiled species and the unique barrier island ecosystem and history) while maintaining existing panels.</p> <p>Create station specific video and virtual tours of the refuge as needed.</p> <p>Create a visitor services map tear sheet.</p> <p>Complete interpretation opportunities on website and maintain monthly updates.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Wildlife Observation and Photography	<p>Maintain hiking trails and primitive road system.</p> <p>Currently offer monthly tours sponsored by friends group.</p> <p>No current management for photography.</p>	<p>Establish 5 key photo spots with GPS points with accompanying maps and post on website.</p> <p>Evaluate and consider expanding non-motorized trails (i.e. Indian Pass area) on refuge.</p> <p>Discontinue vehicle tours of island.</p>	<p>Expand Alternative A.</p> <p>Establish 5 key photo spots with GPS points with accompanying maps and post on.</p> <p>Evaluate a proposed observation platform with interpretative panels, viewing scope, a restroom, trail and kayak launch for 14 Mile site.</p> <p>With partners host one photo class per year.</p> <p>Evaluate and consider expanding non-motorized trails (i.e. Indian Pass area) on refuge.</p> <p>Create a virtual tour of the refuge to be uploaded to the website and work with St. Marks Photo Club to accomplish.</p> <p>Explore creating a refuge DVD.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Outreach	<p>Continue to strengthen public relations with local, state and federally-elected officials.</p> <p>As events occur submit news release articles to the local media and issue public notices for proposed actions.</p> <p>Maintain and expand current media contact list while strengthening relations with local outreach organizations.</p> <p>Work with partners to annually support at least 3 local outreach activities/events promoting the refuge purpose and mission.</p> <p>Submits a monthly article to The Apalachicola Times.</p>	<p>Expand Alternative A.</p> <p>Key messages will now focus on natural and primitive processes include new key messages on global climate change, SHC initiative, and LCC with on and off site programs.</p> <p>Actively maintain current visitor information on refuge web site regarding programs and facilities.</p> <p>Develop an outreach plan.</p> <p>Become a member of Chamber of Commerce and Tourist Development Council organizations.</p>	<p>Expand Alternative A.</p> <p>Key message will focus on imperiled species and the unique barrier island ecosystem and history while including new key messages on global climate change, SHC initiative, and LCC with on and off site programs.</p> <p>Actively maintain current visitor information on refuge web site regarding programs and facilities.</p> <p>Develop an outreach plan.</p> <p>Become a member of Chamber of Commerce and Tourist Development Council organizations.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Volunteers	<p>Continue to promote local and seasonal volunteers.</p> <p>Refuge provides 3 RV trailer campsites.</p> <p>Continue annual volunteer training and recognition program.</p> <p>Annually follow policy and guidance to recruit volunteers and manage the volunteer program.</p>	<p>Expand Alternative A.</p> <p>Create a volunteer management plan.</p> <p>Annually renew volunteer agreements and perform volunteer evaluations.</p> <p>Continue to support local RV volunteers to support refuge operations.</p> <p>Maintain and enhance 14 Mile RV trailer campsite area to include the installation of concrete pads for all sites with a common, screened picnic pavilion.</p>	<p>Same as Alternative B.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Friends Group	<p>Supporters of St. Vincent NWR, Inc. was established in 2006.</p> <p>Attend monthly Friends group meetings providing refuge updates to the group.</p> <p>Provide Friends group office space for operations of the group.</p> <p>Annually provide Friends group with a project proposal list with estimated budgetary needs.</p>	<p>Expand Alternative A.</p> <p>Schedule a retreat to establish sound target goals for the group for the next 15 years.</p> <p>Work with Friends group to immediately complete Friends group website.</p> <p>Annually conduct a retreat with Friends Group board and staff to establish goals that support the refuge mission.</p>	<p>Same as Alternative B.</p>
Access	<p>Access to St. Vincent Island and Pig Island are by private vessel during daylight use.</p> <p>Docking around the perimeter of the islands is acceptable except at the Indian Pass point on St. Vincent Island.</p>	<p>Same as Alternative A.</p>	<p>Expand Alternative A.</p> <p>Improve signage at public boat ramps on the mainland and the loading/unloading dock on St. Vincent Island to clarify access and permitted uses on the refuge.</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Visitor Services Plan	No current Visitor Services Plan.	<p>Prepare and begin to implement a Visitor Services Plan to provide overall management guidance of public use on the refuge.</p> <p>Work with researchers to establish a maximum carrying capacity limit of visitors on St. Vincent Island.</p> <p>Assess and determine amount of staff hours needed from the Complex staff to support refuge.</p>	Same as Alternative B.

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Goal 8: Refuge Administration - Obtain resources necessary to ensure that the goals and objectives for refuge habitats, fish and wildlife populations, land conservation, and visitor services are achieved.			
Property Management	<p>Maintain SAMMS database.</p> <p>Limited maintenance on facilities and equipment.</p> <p>Limited replacement of equipment.</p>	<p>Expand Alternative A.</p> <p>Reduce road system to 20-30 miles to support only necessary management.</p> <p>Evaluate options for visitor contact station/office location.</p> <p>Evaluate a proposed observation platform with interpretative panels, viewing scope, a restroom, trail and kayak launch for 14 Mile site.</p> <p>Maintain and enhance 14 Mile RV trailer campsite area to include the installation of concrete pads for all sites with a common, screened picnic pavilion</p>	<p>Expand Alternative A.</p> <p>Evaluate options for visitor contact station/office location.</p> <p>Evaluate a proposed observation platform with interpretative panels, viewing scope, a restroom, trail and kayak launch for 14 Mile site.</p> <p>Maintain and enhance 14 Mile RV trailer campsite area to include the installation of concrete pads for all sites with a common, screened picnic pavilion</p>

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Personnel Management	Staff of 4 permanent positions Refuge Manager, Office Assistant, and Forestry Technician, and Biological Science Technician	Expand Alternative A. Add 4 permanent positions: Assistant Manager Wildlife Biologist Maintenance worker Federal Wildlife Officer	Expand Alternative A. Add a total of 6 permanent positions: Assistant Manager Wildlife Biologist Maintenance worker Federal Wildlife Officer Boat operator VS Specialist Hire a Wildlife biologist SCEP student Support the YCC program. Explore SCA and AmeriCorps program opportunities.
Partners	Continue to operate with partners such as but not limited to ANERR, FWC, FFS, TNC, DEP, USDA Wildlife Services, USFS, and universities/colleges. Continue with Apalachicola Regional Stewardship Alliance (ARSA). Coordinate with partners to perform research studies.	Expand Alternative A. With partners, strive to promote SHC initiative, LCC, and global climate change management strategies.	Same as Alternative B. Expand fire research related to effects on habitat and species. Seek new grant and partnership ideas.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

The alternatives development process under NEPA and the Improvement Act is designed to allow consideration of the widest possible range of issues and potential management approaches. During the alternatives development process, many different solutions were considered. The following alternative components were considered but not selected for detailed study in this draft comprehensive conservation plan and environmental assessment for the reason(s) described.

Alternative D – Custodial Management

The alternative was eliminated from further consideration early in the planning process. Alternative D was not seriously considered. Custodial management would end any biological, habitat, and public use management occurring on the refuge. No new staff would be hired and existing partnerships would be dissolved. This alternative was eliminated because it would not provide basic protection of the refuge resources.

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 environmental assessment. Conclusions are based on best available scientific information, internal consultation, peer review, and professional judgment of the CCP planning team members. Appendix B of the CCP provides an extensive list of references that were reviewed in preparation of the Draft CCP/EA.

The CCP is a programmatic document intended to analyze proposed actions over a 15 year-time frame on a conceptual level to guide management direction and priorities. It should be noted that these are anticipated effects. Due to the conceptual nature of projects proposed in this plan, actual effects will be detailed later in any step-down management plan or project proposal, which would involve federal, state, regional, and/or local consultation and NEPA compliance.

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.

HEALTH AND SAFETY

Wildfires could have a negative effect on human health and safety. There is a chance of increased health effects associated with smoke and the conducting of prescribed fire under the alternatives. Any increase in time in the field would increase the possibility of injuries to refuge staff. With regular training and safety precautions, field operation hazards will be minimized.

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 EA 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

Department of the Interior Secretarial Order 3226 states that there is a consensus in the international scientific community that global climate change is occurring and that it should be addressed in governmental planning and decision making. S.O. 3226 was amended on January 16, 2009; however, S.O. 3285 issued on March 11, 2009 replaced Amendment Number 1 and re-instated some of the provisions of the 2001 Order. S.O. 3285 established a Climate Change Response Council within the Office of the Secretary, DOI. Its purpose is to facilitate a Department-wide approach for applying scientific tools to increase the agency's understanding of climate change and to coordinate an effective response to the impacts of climate change upon tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department manages. It also made production and transmission of renewable energy on public lands a priority for the Department. The Order calls for the incorporation of climate change considerations into long-term planning documents such as the CCP.

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 CCP 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 subsurface mineral reservations, 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 within the approved acquisition boundary of St. Vincent NWR would come from the Land and Water Conservation Fund; the Migratory Bird Conservation Fund; USACE 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 refuge 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 refuge acquisition boundary 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. It is Service policy that acquisition of private lands is entirely contingent upon 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 the refuge's cultural and historic resources. Potentially negative effects could include logging, construction of new trails or facilities, and development of water impoundments. 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.

REFUGE REVENUE-SHARING

Annual refuge revenue-sharing payments to Franklin and Gulf Counties would continue at similar rates under each alternative.

OTHER EFFECTS

Each of the alternatives would have similar effects or minimal to negligible effects on soils, water quality and quantity, noise, transportation, human health and safety, children, hazardous materials, waste management, aesthetics and visual resources, and utilities and public services.

SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative. Table 12 summarizes and addresses the likely outcomes for the specific issues, and is organized by broad issue categories.

ALTERNATIVE A (CURRENT MANAGEMENT - NO ACTION)

This alternative would maintain the status quo, which would have net positive beneficial impacts on the human environment, wildlife populations, and wildlife habitat. Implementation of Alternative A is anticipated to result in net positive environmental benefits but is not considered to be the most effective management strategy for achieving the goals and objectives of the refuge.

The refuge would continue to collect wildlife population information that contributes to good adaptive management. Protection would be given for sensitive nest sites for shorebirds, wading birds and marshbirds. The wood duck nesting box program would continue. Hunting would continue to be a management tool for maintaining a balanced healthy white-tailed deer population. The fisheries

program would continue. Reptiles and amphibians would be surveyed with the help of partnerships. There would be no active management for invertebrates.

The red wolf population would continue to be monitored and maintained on the refuge. Sea turtle nests would be protected from predators and surveys would be conducted during nesting. Water level management would continue for wood stork populations with sightings documented. Critical habitat would be protected for piping plovers and populations would be surveyed through partnerships. Snowy plover nests would be protected from disturbance. Habitat for gopher tortoise populations would be enhanced and protected. There would be no active management for Eastern indigo snakes, Florida manatee, or state-listed plants. Gulf sturgeon populations would be monitored through partnerships.

The refuge would maintain a periodic prescribed fire regime and restore marsh habitat. Management of open water including impoundments would remain the same. The refuge would maintain the current rate of dune habitat damage with limited beach access points and continue to apply strict staff beach driving rules. Habitat restoration of closed roads and habitat improvement of open roads would continue. There would be no active forest management. Annual prescribed burns would be conducted to benefit wildlife and plant needs and reduce fuel loads.

There would be limited removal of feral hogs on the refuge. The refuge would continue to maintain a population of sambar deer. Removal of coyotes would continue. All known areas of exotic, invasive, and nuisance animals and terrestrial plants would be aggressively controlled and monitored as needed. There would be minimal management of exotic, invasive, or nuisance aquatic plants. Knowledge would continue to be gained and shared with the public concerning climate change.

Law enforcement for visitor safety, resource protection, and compliance with refuge regulation would remain periodic. Archaeological and historical sites would continue to be protected but surveying for unknown sites would be minimal. There would be occasional involvement with landowners concerning FSA conservation easements.

The refuge would continue maintaining an informational relationship with the public through a contact station, signage, brochures, websites, and kiosks. Current hunting and fishing programs would be maintained. The refuge would provide limited environmental education and interpretation programs. Opportunities for wildlife observation and photography would be maintained. There would be no structured photography program. The public would continue to be informed of refuge issues, opportunities, and proposed actions. The refuge would continue to promote local and season volunteers and support the friends group. Access to the refuge would remain the same.

The refuge would continue day-to-day operations with minimal staffing, funding, facilities and equipment. Good communication with partners would continue. The refuge would not have an updated wildlife inventory and monitoring plan, habitat management plan, animal control plan, and visitor services plan.

ALTERNATIVE B (EMPHASIZE NATURAL AND PRIMITIVE PROCESSES)

Alternative B would emphasize natural and primitive processes on the refuge. Implementation of Alternative B is anticipated to result in net positive environmental benefits.

The refuge would increase surveying and monitoring of land birds, raptors, shorebirds, wading birds, marshbirds, waterfowl, reptiles, amphibians, and invertebrates through partnerships. There would be a potential for less management and no prescribed burning to support land bird and raptor habitat.

The wood duck box program would be phased out which could reduce nesting opportunities. The refuge would continue to maintain a balanced healthy white-tailed deer population through hunting. Surveys, monitoring, and documentation of other mammal activity would increase. The water flow would be returned to a natural process which could result in a loss of habitat for freshwater fish.

The refuge would continue to monitor and maintain a red wolf pack on the refuge. Volunteers would be used to conduct nest surveys for sea turtles. Removal of native predators would not occur on the refuge which could result in high populations of raccoons. The refuge would document sightings of wood stork and increase surveys. There would be increased information gathering on snowy plover and piping plover populations through partnerships. Habitat for gopher tortoise populations would be enhanced and protected. The refuge would evaluate the potential for restocking Eastern indigo snakes and aggressively control feral hog populations. There would be active management with partners to support the recovery of Florida manatee. Gulf sturgeon populations would be monitored through partnerships. The refuge would seek partnership opportunities to survey and monitor populations and locations of state-listed plants.

The refuge would restore marsh habitat and monitor effects to key species. Impoundments would be opened to allow for natural water flow which could affect habitat for bird species. The refuge would maintain the current rate of dune habitat damage with limited beach access points and continue to apply strict staff beach driving rules. Habitat restoration of closed roads and habitat improvement of open roads would continue. Road miles would be reduced. There would be an evaluation of active forest management. No prescribed burns would be conducted on St. Vincent and Pig Island and monitoring would be increased to evaluate the effects. There would be population removal of feral hogs, sambar deer, and coyotes. All known areas of exotic, invasive, and nuisance animals and plants would be aggressively controlled and monitored as needed. The refuge would increase knowledge of climate change and share that information with the public. There would be an increase of research to support management for climate change.

The refuge would gain an additional federal wildlife officer to provide increased law enforcement for visitor safety, resource protections, and public compliance with refuge regulations. Archaeological and historical site protection would be expanded and surveys would be conducted to increase knowledge of unknown sites. The refuge would acquire lands that provide resource and public use values from willing sellers through fee title purchase, donation, mitigation, purchase and transfer, or other viable means. There would be annual involvement with landowners concerning FSA conservation easements.

The refuge would continue informing with the public through a contact station, signage, brochures, websites, and kiosks. The hunt program would continue with limited staff. The fishing program would continue without restocking of freshwater fish. Fishing would be based on natural processes. The refuge would increase environmental education and interpretation programs that focus on natural and primitive processes. Vehicle tours would be discontinued. Opportunities for wildlife observation and photography would be expanded with a focus on natural and primitive processes. The refuge would enhance and promote local and seasonal volunteers and support the friends group. Access to the refuge would remain the same.

The refuge would continue day-to-day operations with enhanced staffing, funding, facilities and equipment. Good communication with partners would continue and include SHC and LCC initiatives. The refuge would complete a wildlife inventory and monitoring plan, habitat management plan, animal control plan, and visitor services plan.

*ALTERNATIVE C (EXPAND RESOURCE MANAGEMENT FOR NATIVE AND IMPERILED SPECIES
– PROPOSED ALTERNATIVE)*

Alternative C would expand resource management for native and imperiled species on the refuge. Implementation of Alternative C is anticipated to result in net positive environmental benefits.

The refuge would enhance nesting habitat and increase surveying and monitoring of land birds, raptors, shorebirds, wading birds, marshbirds, waterfowl, reptiles, amphibians, and invertebrates through partnerships. The wood duck nesting box program would continue. The refuge would continue to maintain a balanced healthy white-tailed deer population through hunting. Surveys, monitoring, and documentation of other mammal activity would increase. The refuge would continue with the fisheries management program and evaluate the health of the fish populations.

The refuge would continue to monitor and maintain a red wolf pack on the refuge. Sea turtle nests would be protected from predators and surveys would be conducted during nesting. The refuge would increase surveys of wood stork. There would be increased information gathering on snowy plover and piping plover populations through partnerships. Habitat for gopher tortoise populations would be enhanced and protected. The refuge would evaluate the potential for restocking Eastern indigo snakes and aggressively control feral hog and raccoon populations. There would be active management with partners to support the recovery of Florida manatee. Gulf sturgeon populations would be monitored through partnerships. The refuge would seek partnership opportunities to survey and monitor populations and locations of state-listed plants.

The refuge would restore marsh habitat, maintain periodic prescribed fire, and monitor effects to key species. Water levels in impoundments would be managed with increased monitoring of water quality and vegetation responses. The refuge would maintain the current rate of dune habitat damage with limited beach access points and continue to apply strict staff beach driving rules. Habitat restoration of closed roads and habitat improvement of open roads would continue. There would be an evaluation of active forest management. Annual prescribed burns would be conducted based on fuel loads, wildlife, and plant needs. There would also be an increase of research and monitoring of effects of prescribed burns.

There would be population removal of feral hogs. The refuge would continue to maintain a population of sambar deer. Removal of coyotes would continue. All known areas of exotic, invasive, and nuisance animals and plants would be aggressively controlled and monitored as needed. The refuge would increase knowledge of climate change and share that information with the public. There would be an increase of research to support management for climate change.

The refuge would gain an additional federal wildlife officer to provide increased law enforcement for visitor safety, resource protections, and public compliance with refuge regulations. Archaeological and historical site protection would be expanded and surveys would be conducted to increase knowledge of unknown sites. The refuge would acquire lands that provide resource and public use values from willing sellers through fee-title purchase, donation, mitigation, purchase and transfer, or other viable means. There would be annual involvement with landowners concerning FSA conservation easements.

The refuge would continue and expand information sharing with the public through a contact station, signage, brochures, websites, and kiosks. Current hunting programs would continue as in Alternative A. The refuge would also evaluate the carrying capacity of hunters on the refuge. The fishing program would be maintained as in Alternative A. Catch data would be recorded. The refuge would increase environmental education and interpretation programs that incorporate Florida Sunshine Standards which focus on imperiled species, the unique barrier island history, and ecosystems

including climate change effects for students and teachers. An evaluation program would be developed. Opportunities for wildlife observation and photography would be expanded including facility improvements. The public would be better informed of refuge issues, opportunities, and proposed actions. The refuge would enhance and promote local and seasonal volunteers and support the friends group. Access to the refuge would remain the same.

The refuge would continue day-to-day operations with enhanced staffing, funding, facilities and equipment. Good communication with partners would continue and include SHC and LCC initiatives. The refuge would complete a wildlife inventorying and monitoring plan, habitat management plan, animal control plan, and visitor services plan.

Table 10. Summary of environmental effects by alternative for St. Vincent NWR

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Goal 1: Fish and Wildlife Population Management - Protect, maintain, enhance, and restore healthy and viable populations of migratory birds, resident wildlife, and fish.			
Land Birds	Information gathered contributes to good adaptive management for the species. Neutral to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Potential for less management and no prescribed burning. Negative to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Enhance nesting habitat. Positive
Raptors	Information gathered contributes to good adaptive management for the species. Neutral to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Potential for less management and no prescribed burning. Negative to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Enhance nesting habitat. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Shorebirds, Wading Birds, and Marshbirds	Information gathered contributes to good adaptive management for the species. Provide protection of known sensitive nest sites. Neutral to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Increase protection of known sensitive nest sites. Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Increase protection of known sensitive nest sites. Positive
Waterfowl	Information gathered contributes to good adaptive management for the species. Continue with wood duck box program. Neutral to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Phase out wood duck box program. Neutral to Negative	Information gathered contributes to good adaptive management for the species. Continue with wood duck box program. Establish additional surveys. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Native Mammals	Maintain a balanced healthy white-tailed deer herd through the use of the hunt program. Survey, monitor, and document other mammal activity that provides for additional knowledge of the species and its needs. Neutral to Positive	Maintain a balanced healthy white-tailed deer herd through the use of the hunt program. Increase the amount of surveys, monitoring, and documentation of other mammal activity that provides for additional knowledge of the species and its needs. Neutral to Positive	Maintain a balanced healthy white-tailed deer herd through the use of the hunt program. Increase the amount of surveys, monitoring, and documentation of other mammal activity that provides for additional knowledge of the species and its needs. Neutral to Positive
Freshwater Fish	Continue with fisheries management program but an updated fish management plan is needed. Neutral to Positive	Return water flow back to natural process allowing species to reproduce in a more natural system. Reducing freshwater fish populations and habitat. Negative	Continue with fisheries management program with an updated fish management plan. Evaluate the health of the fish population. Positive
Reptiles and Amphibians	Work with partners to gathered information about a species contributes to good adaptive management for the species. Neutral to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Neutral to Positive	With partner support increase surveying and monitoring of specific species to enhance knowledge that can support sound management for the species. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Invertebrates	No active management. Negative to Neutral	Work with partners to gathered information about a species contributes to good adaptive management for the species. Neutral to Positive	With partner support increase surveying and monitoring of specific species to enhance knowledge that can support sound management for the species. Neutral to Positive
Wildlife Inventorizing and Monitoring Plan	Outdated Plan. Negative to Neutral	Operate under an updated plan. Positive	Operate under an updated plan. Positive
Goal 2: Rare, Threatened and Endangered Species - Promote the recovery of rare, threatened, and endangered plants and animals.			
Red Wolf	Monitor and maintain a red wolf pack on St. Vincent Island. Positive	Monitor and maintain a red wolf pack on St. Vincent Island. Positive	Monitor and maintain a red wolf pack on St. Vincent Island. Conduct studies to gain a better understanding of the red wolf. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Sea Turtles (Loggerhead, Green, Leatherback, and Kemp's Ridley)	Partner to conduct nest surveys and determine success rates to support the population. Protect nests from depredation. Positive	Partner to conduct nest surveys and determine success rates to support the population. Nesting is focused on a more natural process (i.e., predator versus prey relationship). Increased population of raccoons. Negative to Positive	Partner to increase number of days per week to conduct nest surveys and determine success rates to support the population. Protect nests from depredation. Positive
Wood Stork	Manage water levels and document sightings. Negative to Positive	Allow natural water flow process to occur and document sightings. Increase amount of survey and monitoring activity. Negative	Manage water levels and increase amount of survey and monitoring activity. Neutral to Positive
Snowy Plover	Work with partners to gain information about the species which contributes to good adaptive management for the species. Protect nests from disturbance. Positive	Increase the opportunity to work with partners to gain additional information about the species. Protect nests from disturbance. Positive	Increase the opportunity to work with partners to gain additional information about the species. Protect nests from disturbance. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Piping Plover	Work with partners to gain information about the species which contributes to good adaptive management for the species. Protect critical habitat areas. Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Protect critical habitat areas. Positive
Gopher tortoise	Work with partners to gain information about the species which contributes to good adaptive management for the species. Enhance and protect key habitat areas. Neutral to Positive	Work with partners to gain information about the species which contributes to good adaptive management for the species. Enhance and protect key habitat areas. Neutral to Positive	With partner support increase surveying and monitoring to gain knowledge that can support sound management for the species. Enhance and protect key habitat areas. Positive
Eastern Indigo Snake	No current management. Neutral	Evaluate the potential for restocking the species and aggressively control feral hog populations. Neutral to Positive	Evaluate the potential for restocking the species and aggressively control feral hog and raccoon populations. Neutral to Positive
Florida Manatee	No current management. Neutral	Work with partners to support the recovery of the species. Neutral to Positive	Work with partners to support the recovery of the species. Neutral to Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Gulf Sturgeon	Support management goals of sturgeon and their critical habitats through partnerships. Positive	Support management goals of sturgeon and their critical habitats through partnerships. Positive	Support management goals of sturgeon and their critical habitats through partnerships. Positive
State-listed plants	No current management. Negative to Positive	With partner support survey and monitor to enhance knowledge of populations and locations. Negative to Positive	With partner support increase surveying and monitoring to enhance knowledge that can support sound management for the species. Positive
Goal 3: Habitat Management - Protect, maintain, enhance, and restore suitable habitat for the conservation and management of migratory birds, resident wildlife, fish, and native plants, including all rare, threatened and endangered species.			
Marsh (Salt and freshwater)	Maintain periodic prescribed fire regime. Restore marsh habitat. Positive	Restore marsh habitat and monitor effects to key species. Neutral to Positive	Maintain periodic prescribed fire regime. Restore marsh habitat and monitor effects to key species. Positive
Open Water (including impoundments)	Maintain existing management regimes of impoundments. Positive	Allow natural water flow process. Negative to Positive	Manage water levels in impoundments with increased monitoring of water quality, water levels and vegetation. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Beach and Dunes	Maintain current rate of dune habitat damage with limited beach access points and apply strict staff beach driving rules. Negative to Neutral	Maintain current rate of dune habitat damage with limited beach access points and apply strict staff beach driving rules. Negative to Neutral	Maintain current rate of dune habitat damage with limited beach access points and apply strict staff beach driving rules. Neutral
Roads - restoration	Habitat restoration of closed roads and habitat improvement of open roads. Positive	Reduce road miles. Habitat restoration of closed roads and habitat improvement of open roads. Positive	Habitat restoration of closed roads and habitat improvement of open roads. Positive
Forest Management	No current management. Negative to Neutral	Evaluate forest condition and update management plan. Neutral to positive	Evaluate forest condition and update management plan. Neutral to positive
Fire Management	Annual prescribed burns conducted based on fuel loads and wildlife and plant needs. Manage wildfire within burn unit blocks. Neutral to Positive	Allow natural processes on St. Vincent and Pig Islands (i.e. no prescribed burns). Increase research and monitoring of effects. Negative to Positive	Annual prescribed burns conducted based on fuel loads and wildlife and plant needs. Manage wildfire within burn unit blocks. Increase research and monitoring of effects. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Habitat Management Plan	No current HMP. Negative to Neutral	Operate under a HMP including an AHMP. Positive	Operate under a HMP including an AHMP. Positive
Goal 4: Exotic, Invasive, and Nuisance Species - Manage exotic, invasive, and nuisance species on the refuge to maintain and enhance the biological integrity of refuge habitats.			
Control of feral hogs	Limited removal. Positive	Population removal. Positive	Population removal. Positive
Control of sambar deer	Maintain a population of 75- 100. Negative to Neutral	Population removal. Positive	Maintain a population of 75-100. Negative to Neutral
Control of Coyotes	Removal of all known occurrences. Positive	Removal of all known occurrences. Positive	Removal of all known occurrences. Positive
Control of other exotic, invasive, and nuisance animals	Monitor and document population changes. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Positive	Monitor document population changes. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Positive	Monitor document population changes. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Control of exotic, invasive, and nuisance terrestrial plants	Monitor old sites and document new populations. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Positive	Monitor old sites and document new populations. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Positive	Monitor old sites and document new populations. Aggressively control, and remove as appropriate any exotic, invasive and nuisance species. Develop a treatment plan. Positive
Control of exotic, invasive, and nuisance aquatic plants	No current management. Negative	Monitor and document populations. Removal of all exotics. Positive	Monitor and document populations. Develop a treatment plan. Positive
Exotic, Invasive, and Nuisance Species Control Plan	Outdated plan. Neutral to Positive	Operate under updated plan. Positive	Operate under updated plan. Positive
Goal 5: Climate Change - Adapt management consistent with the best available scientific projections regarding environmental changes in order to protect refuge resources.			
Outreach and Education	Gain and share knowledge of climate change. Neutral to Positive	Increase knowledge of climate change and share with public including partners. Positive	Increase knowledge of climate change and share with public including partners. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Research and Monitoring	SLAMM study report. Neutral to Positive	Increase information and research to support management. Neutral to Positive	Increase information and research to support management. Neutral to Positive
Goal 6: Resource Management and Protection - Maintain, preserve and protect archaeological, cultural, historic, and natural resources representing the natural and cultural history of the local area.			
Provide visitor safety, protect resources and ensure public compliance with refuge regulations	Periodic law enforcement. Negative	Obtain additional law enforcement support. Neutral to Positive	Obtain additional law enforcement support. Neutral to Positive
Archaeological and Historical site protection	Continue to protect sites. Minimal involvement in gaining additional knowledge of known sites and surveying the rest of the refuge for sites. Neutral to Positive	Expand protection and knowledge of archaeological and historic sites and promote educational awareness. Positive	Expand protection and knowledge of archaeological and historic sites and promote educational awareness. Positive
Land Acquisition	Establish Minor Expansion Plan. Positive	Acquire land that provides resource and public use values from willing sellers by: fee title purchase, donation, mitigation, purchase and transfer, or other viable means. Positive	Acquire land that provides resource and public use values from willing sellers by: fee title purchase, donation, mitigation, purchase and transfer, or other viable means. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
FSA conservation easements	Occasional involvement with easement and landowners. Negative to Neutral	Annual involvement with easement and landowners with management plans for all easements. Neutral to Positive	Annual involvement with easement and landowners with management plans for all easements. Neutral to Positive
Goal 7: Visitor Services - Promote an understanding and appreciation of fish and wildlife resources and provide the public with high quality and safe outdoor education and recreation experiences that are compatible with natural resource conservation and the primitive-use concept of the refuge.			
Welcome and Orient	Maintain an informational relationship with the public through a contact station, signage, brochures, website and kiosks. Neutral to Positive	Maintain an informational relationship with the public through a contact station, signage, brochures, website and kiosks. Neutral to Positive	Maintain an update informational relationship with the public through a contact station, signage, brochures, website and kiosks. Evaluate and expand program as appropriate. Positive
Hunting	Maintain current hunting program with three hunts (archery and primitive weapons for white-tailed deer, feral hogs, and raccoons, a lottery primitive weapons sambar deer with hogs and raccoons). Evaluate hunt program. Positive	Hunt program with limited staffing support for white-tailed deer and raccoons. Sambar deer and feral hogs will be eradicated. Evaluate hunt program. Negative to Positive	Hunt program with three hunts (archery and primitive weapons for white-tailed deer and raccoons, a lottery primitive weapons sambar deer with raccoons). Feral hogs will be eradicated. Evaluate hunt program including carrying capacity of hunters. Negative to Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Fishing	Maintain existing fishing program. Neutral to Positive	Continue fishing program but no restocking of freshwater fish. Fishing will be based on natural process. Negative	Maintain existing fishing program but with catch data recorded and more educational awareness. Positive
Environmental Education	Provide limited environmental education programs related to imperiled species and the unique barrier island ecosystem and history. Positive	Conduct on and off refuge environmental education programs that focus on natural and primitive process for students and teachers. Positive	Conduct on and off refuge environmental education programs that incorporate Florida Sunshine Standards which focus on imperiled species, the unique barrier island history and ecosystem including climate change effects for students and teachers. Develop an evaluation program. Positive
Interpretation	Maintain current limited interpretive opportunities with key message focused on sea turtles, red wolves, relationship of island to estuary, migratory birds, NWRS, history, and fire. Positive	Key messages will focus on natural and primitive processes with vehicle tours discontinued. Negative to Positive	Key messages will focus on imperiled species, and the unique barrier island ecosystem and history including climate change, SHC, and LCC information for on and off site programs. Increase interpretive materials for public to gain additional information. Evaluate program. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Wildlife Observation and Photography	Provide opportunity for wildlife observation and photography but no structured photography program. Neutral to Positive	Expand opportunity for wildlife observation and photography but with natural and primitive process in mind. Vehicle tours discontinued. Negative to Positive	Expand opportunity for wildlife observation and photography including facility improvements. Evaluate program. Positive
Outreach	Public informed of refuge issues, opportunities and proposed actions. Positive	Better inform public of refuge actions. Positive	Better inform public of refuge actions. Positive
Volunteers	Promote local and seasonal volunteer support. Positive	Enhance volunteer program. Positive	Enhance volunteer program. Positive
Friends Group	Support Friends group. Neutral to Positive	Strengthen Friends group to help achieve refuge mission. Positive	Strengthen Friends group to help achieve refuge mission. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Access	Access to St. Vincent Island and Pig Island is by private vessel during daylight use. There is a public boat dock facility at the west end of St. Vincent Island however docking around the perimeter of the islands is acceptable except at the Indian Pass point on St. Vincent Island . Neutral to Positive	Access to St. Vincent Island and Pig Island is by private vessel during daylight use. There is a public boat dock facility at the west end of St. Vincent Island however docking around the perimeter of the islands is acceptable except at the Indian Pass point on St. Vincent Island . Neutral to Positive	Access to St. Vincent Island and Pig Island is by private vessel during daylight use. There is a public boat dock facility at the west end of St. Vincent Island however docking around the perimeter of the islands is acceptable except at the Indian Pass point on St. Vincent Island . Neutral to Positive
Visitor Services Plan	No current plan. Negative	Develop and implement a Visitor Service Management Plan with carrying capacity analysis. Neutral to Positive	Develop and implement a Visitor Service Management Plan with carrying capacity analysis. Neutral to Positive
Goal 8: Refuge Administration - Obtain resources necessary to ensure that the goals and objectives for refuge habitats, fish and wildlife populations, land conservation, and visitor services are achieved.			
Property Management	Provided with minimal facilities and equipment. Negative	Enhance facilities and equipment. Positive	Enhance facilities and equipment. Positive

Issues	Alternative A Current Management No Action Alternative	Alternative B Emphasize natural and primitive processes	Alternative C (Proposed Alternative) Expand resource management for native and imperiled species
Personnel Management	Inadequate staff and management capability to achieve refuge mission. Response to issue generally on a reactive not proactive basis. Negative	Increased staff would allow refuge to achieve the goals and objectives of this plan. Positive	Increased staff would allow refuge to achieve the goals and objectives of this plan. Positive
Partners	Good communication and interaction positively impacts refuge planning and programs. Positive	Good communication and interaction positively impacts refuge planning and programs. Expand partnerships to include SHC and LCC initiative. Positive	Good communication and interaction positively impacts refuge planning and programs. Expand to include SHC and LCC initiative and fire partnerships. Positive
Financial Resources	Minimal to meet refuge operations. Negative to Neutral	Enhance to meet refuge goals and objectives of this plan. Positive	Enhance to meet refuge goals and objectives of this plan. Positive

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 will continue to impact refuge resources.

Alternative C, 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 water management activities; road and levee maintenance; and the construction of observation towers, boat ramps, and a headquarters and visitor center is expected to be minor and of short duration. To further reduce potential impacts, the refuge would use best management practices to minimize the erosion of soils into water bodies.

Foot traffic on new and extended foot trails is expected to have a negligible impact on soil erosion. To minimize the impacts from public use, the refuge would include informational signs that request trail users to remain on the trails, in order to avoid causing potential erosion problems.

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. Providing access for fishing opportunities allows the use of a renewable natural resource without adversely impacting other resources. Hunting would also be managed with restrictions that ensure minimal impact on other resources. General wildlife observation may result in minimal disturbance to wildlife. If the refuge determines 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 their length. This is expected to be a minor short-term impact.

Increased visitor use may increase the potential for the introduction of new exotic species into areas when visitors do not comply with boating regulations at the boat ramps and other access points, or with requests to stay on trails. The refuge would minimize this impact by enforcing the regulations for access to the refuge's water bodies, and by installing informational signs that request users to stay on the trails.

USER GROUP CONFLICTS

As public use increases, unanticipated conflicts between different user groups could occur. If this should happen, the refuge would adjust its programs, as needed, to eliminate or minimize any public use issues. The refuge would use methods 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 ADJACENT LANDOWNERS

Implementation of the proposed alternative is not expected to negatively affect the owners of private lands adjacent to the refuge. Positive impacts that would be expected include higher property values, less intrusion of invasive exotic plants, and increased opportunities for viewing more diverse wildlife.

However, some negative impacts that may occur include a higher frequency of trespass onto adjacent private lands, and noise associated with increased traffic. To minimize these potential impacts, the refuge would provide informational signs that clearly mark refuge boundaries; maintain the refuge's existing parking facilities; use law enforcement; and provide increased educational efforts at the visitor center.

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 refuge's approved acquisition boundary are currently undeveloped. If these lands are acquired as additions to the refuge, they would be maintained in a natural state, managed for native wildlife populations, and opened to wildlife-compatible public uses, where feasible.

Potential development of the refuge's buildings, trails, 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. The visitor center would be constructed to be aesthetically pleasing to the community and to avoid any additional impacts to native plant communities. 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 Code of Federal Regulations, 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 would 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 would likely happen to it.

A few activities or actions in the proposed management plan are anticipated to have minor to negligible cumulative impacts. These are discussed as follows.

EFFECTS ON THE PHYSICAL ENVIRONMENT

All the alternatives provide for habitat restoration and enhancement projects and land acquisition. For instance the road restoration project designed to reduce and restore road areas to allow a more natural flow of water across St. Vincent Island has required a lot of detailed study, analysis and planning and would continue to be evaluated as the projects continues. Collectively, over time, and in working with other conservation partners, these actions would improve the refuges native habitats.

The majority of the refuge lands is part of a series of barrier islands along the coastline of the panhandle of Florida. With the increasing effects of climate change, (impacts by hurricanes, storm surges, sea-level rise, etc.) there is a need for detailed studies, analysis and planning to gain a better understanding of the refuge land’s role as part of the chain of islands. A close working relationship with other conservation partners to achieve additional knowledge of the role the barrier island would be necessary.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

Although the degree of habitat quality and improvement differs under the three alternatives, all are intended to improve fish and wildlife habitat and populations. For species that are threatened, endangered, candidate, rare or have declining populations, this improvement is important to their overall population and genetic diversity.

Under the proposed alternative, it is anticipated that the prescribed burn program would have a minimal negative cumulative effect. In the panhandle of Florida it is a natural process to have fire in the various habitat types. With the use of prescribed burns, conducted under agency policies and approved fire management plan it would help control fire behavior to reduce risk of undesirable conditions that could affect lives, and resources. In addition, the managed burns reduce fuel loads, help prevent catastrophic wildfires and support habitat needs for a variety of species. Throughout the life of the management plan, studies would be conducted to evaluate the effects of fire on the landscape.

The proposed eradication program for the feral hog on St. Vincent Island is not expected to have a significant cumulative effect. Feral hogs are an extremely invasive, introduced non-native species and have been considered a game species in the State of Florida since 1956. Feral hogs compete

with native wildlife for hard mast. Feral hogs can cause damage in forested areas with the consumption of tree seeds and seedlings. Feral hogs have also been recorded consuming nests and young reptiles, ground-nesting birds, and mammals (Guiliano and Tanner 2005). Rooting and wallowing behavior can cause damage to habitat and water quality. The removal of feral hogs is not likely to impact refuge biota, habitats, or conflict with other wildlife-dependant recreational uses.

EFFECTS ON THE SOCIO-ECONOMIC ENVIRONMENT

Because of concerns expressed about the cumulative effects of hunting on certain national wildlife refuges, this section discusses in some detail the cumulative impacts of the hunting program at St. Vincent NWR.

White-tailed deer is a game mammal in the State of Florida and is protected by State statutes and Florida Wildlife Conservation Commission rules. Home ranges of these deer are restricted so regional impacts to populations are not likely to occur. White-tailed deer can become destructive to habitats when densities become too high for the habitat to support. High densities can also result in a negative impact on deer health. The management of deer through hunting is often necessary and also provides economic return for local economies and provides funding to state programs that benefit all wildlife (Schaefer and Main 1997). Hunter numbers are limited and no motorized vehicles are allowed. Negative impacts on habitat are not likely to occur. Since breeding seasons largely occur outside of deer hunting season, no cumulative effects are anticipated on resident wildlife, migratory birds, and non-hunted wildlife.

Sambar deer are an exotic species from southeast Asia that were introduced in 1908 prior to the refuge's establishment. Sambar and white-tailed deer do compete for certain foods but generally occupy very different ecological niches. However the results of research studies indicate there is no immediate threat to white-tailed deer or other native species presently on St. Vincent Island (Flynn et al. 1990). During the research study the highest population density occurred in freshwater habitat. Under the proposed alternative the sambar deer would remain on the island and managed through the refuge hunt program. There is no intent to populate the deer outside of St. Vincent Island. The sambar deer is not a state protected species or a managed game animal.

Raccoons are primary carriers of rabies in Florida and may also carry distemper and tuberculosis. Depredation by raccoons on eggs and hatchlings of federally protected sea turtles can significantly decrease hatchling productivity. However, it is unknown whether removal of raccoons may have additional ecological consequences (Ratnaswamy and Warren 1998).

Non-hunted resident wildlife would include resident birds, small mammals such as moles, mice, and bats; reptiles and amphibians such as snakes, turtles, salamanders, frogs and toads; and invertebrates such as butterflies, moths, insects and spiders. Due to limited home ranges of these animals, regional impacts would not occur. Locally there may be temporary displacement of resident birds. Disturbance of many small mammals, reptiles, or amphibians would be minimal due to inactivity during hunt seasons. Invertebrates also limit activity during the hunting season when temperatures are lower. The refuge anticipates no measureable negative cumulative impacts to resident non-hunt wildlife populations locally or regionally.

With increased wildlife-dependent recreation opportunities, user group conflicts may occur. The refuge's visitor use programs would be adjusted as needed to eliminate or minimize occurrences to provide quality wildlife-dependent recreational opportunities.

Hunting on the refuge does not pose any threat to historic properties on and or near 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 vehicular traffic.

Other indirect effects that may result from implementing the proposed alternative include minor impacts from siltation due to the disturbance of soils and vegetation while expanding the water control structures, as well as expanding or creating new foot trails; construction of the observation tower and visitor center; and providing greater visitor access through improvements to the boat ramps.

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 plan 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 refuge's 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 the refuge's natural resources. The plans 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 its preparation.

The following meetings, contacts, and presentations were undertaken by the Service during the preparation of this Draft CCP/EA:

CCP PLANNING TEAM (ALL U.S. FISH AND WILDLIFE SERVICE)

James Burnett, Project Leader, North Florida NWR Complex
Shelly Stiaes, Refuge Manager, St. Vincent NWR
Charlotte Chumney, Office Assistant, St. Vincent NWR
Bradley Smith, Biological Science Technician, St. Vincent NWR
Robin Will, Public Use Specialist, St. Marks NWR
Joe Reinman, Wildlife Biologist, St. Marks NWR
Greg Titus, Fire Management Officer, St. Marks NWR
Frank Parauka, retired Fisheries Biologist, Panama City Ecological Services Office
Harold Mitchell, Biologist, Panama City Ecological Services Office
Monica Harris, former Natural Resource Planner, Jacksonville, NC
Laura Housh, Natural Resource Planner, Regional Office

WILDLIFE AND HABITAT MANAGEMENT REVIEW TEAM

Monica Harris, FWS, former Refuge Manager, St. Vincent NWR; Frank Bowers, retired FWS, Regional Office, Atlanta, GA
Roger Boykin, retired FWS, Regional Office, Atlanta, GA
Dave Brownlie, former FWS, Tallahassee
Randy Cordray, former FWS, St. Vincent NWR
Marc Epstein, former FWS, Merritt Island NWR
Ron Freeman, FWS, Auburn, AL
Robert Gay, former FWS, St. Vincent NWR
Tommy Gay, former FWS, St. Vincent NWR
Susan Grace Wilder, former National Wetlands Research Center, Lafayette, LA
Rob Kelsey, retired FWS, Regional Office, Atlanta, GA
Paul Lang, FWS, Panama City Field Office
Thom Lewis, former FWS, St. Vincent NWR
Roy Ogles, Apalachicola National Estuarine Research Reserve, Florida Department of Environmental Protection (FDEP)
Frank Paruka, retired FWS, Panama City Field Office
Terry Peacock, former FWS, St. Vincent NWR
Steve Shea, former St. Joe Timberlands Company
Dale Shiver, FWS, St. Vincent NWR
George Wallace, Florida Fish and Wildlife Conservation Commission (FWC)

VISITOR SERVICES REVIEW TEAM (ALL FWS)

Garry Tucker, Visitor Services and Outreach Specialist, Regional Office, Atlanta, GA
Monica Harris, former Natural Resource Planner, Jacksonville, NC
Robin Will, Public Use Specialist, St. Marks NWR
David Moody, Volunteer Coordinator, St. Marks NWR
Lori Nicholson, Environmental Education Specialist, St. Marks NWR
Harold Mitchell, Biologist, Panama City Ecological Services Office
Charlotte Chumney, Office Assistant, St. Vincent NWR

CULTURAL RESOURCES REVIEW TEAM

Rick Kanaski, FWS, Regional Archaeologist and Historic Preservation Officer,
Savannah Coastal Refuges
Tom Prusa, retired FWS, Assistant Refuge Manager, Regional Office, Atlanta, GA
Karen Mayo, Graduate Student, Department of Anthropology, University of South Florida
Kelly Hockersmith, Graduate Student, Department of Anthropology, University of South Florida
Daniel T. Penton, Senior Archaeologist, Post Buckley, Schuh, and Jernigan, Tallahassee, Florida
Terry Peacock, FWS, former Refuge Manager, St. Vincent NWR
Monica Harris, FWS, former Assistant Refuge Manager, St. Vincent NWR
Thom Lewis, former Wildlife Biologist, St. Vincent NWR
Robert Gay, former Heavy Equipment Operator, St. Vincent NWR
Mary Morris, Natural Resource Planner, Tallahassee

WILDERNESS REVIEW TEAM

Monica Harris, FWS, former Natural Resource Planner, Jacksonville, NC
Shelly Stiaes, FWS, Refuge Manager, St. Vincent NWR
Robin Will, FWS, Public Use Specialist, St. Marks NWR
Joe Reinman, FWS, Wildlife Biologist, St. Marks NWR
Greg Titus, FWS, Fire Management Officer, St. Marks NWR
Frank Parauka, FWS, Fisheries Biologist, Panama City Ecological Services Office
JerryPitts, FWC, Manager, Box R Wildlife Management Area

INTERGOVERNMENTAL COORDINATION PLANNING TEAM

James Burnett, FWS, Project Leader, North Florida NWR Complex
Joe Reinman, FWS, Wildlife Biologist, St. Marks NWR
Greg Titus, FWS, Fire Management Officer, St. Marks NWR
Frank Parauka, FWS, Fisheries Biologist, Panama City Ecological Services Office
Harold Mitchell, FWS, Biologist, Panama City Ecological Services Office
Monica Harris, FWS, former Natural Resource Planner, Jacksonville, NC
Phil Manor, FWC, Apalachicola Wildlife and Environmental Area Manager
Jean Huffman, FDEP, Manager, St. Joseph Bay State Buffer Preserve
Greg Jubinsky, FWC, Invasive Plant Management
Mark Curenton, Assistant Planner, Franklin County Planner
Wendy Jones, Wildlife Biologist, Tyndall Air Force Base
Victor Rowland, FDACS, Forest Area Supervisor, Tate's Hell State Forest
Seth Blitch, FDEP, Administrator, Apalachicola National Estuarine Research Reserve
Kawika Bailey, FDACS, Forester

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

SYMBOLS, ACRONYMS AND ABBREVIATIONS

§	Section
-	to
%	percent
°C	Degrees Celsius
°F	Degrees Fahrenheit
m ³ /s	cubic meters per second
SO ₂	sulfur dioxide
<	less than
>	greater than
AHWP	annual habitat work plan
ANERR	Apalachicola National Estuarine Research Reserve
ARPA	Archaeological Resource Protection Act of 1979
ARSA	Apalachicola Regional Stewardship Alliance
AQI	Air Quality Index
BBS	breeding bird survey
BCC	Birds of Conservation Concern
BCE	before Common Era
BCR	Bird Conservation Region
BRT	Biological Review Team
ca	circa
CAA	Clean Air Act (federal)
CAMA	Coastal and Aquatic Managed Areas
CCP	Comprehensive Conservation Plan
CE	Common Era
CFR	Code of Federal Regulations
cfs	cubic feet per second
CNAH	Center for North American Herpetology
CRBA	Coastal Resources Barrier Act
CRBS	Coastal Resources Barrier System
DM	Department of Interior Manual
DOF	Florida Division of Forestry
DOI	Department of the Interior
DU	Ducks Unlimited
E	Endangered
EA	Environmental Assessment
EE	environmental education
e.g.	for example
EIS	Environmental Impact Statement
EO	Executive Order of U.S. President
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAC	Florida Administrative Code
FBCI	Florida Bird Conservation Initiative
FCWCS	Florida Comprehensive Wildlife Conservation Strategy
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FNAI	Florida Natural Areas Inventory

FONSI	finding of no significant impact
FR	Federal Register
FS	Florida Statutes
FWRI	Fish and Wildlife Research Institute
FSA	Farm Service Agency
FTE	full-time equivalent
FW	Fish and Wildlife Service Manual
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish and Wildlife Service (also Service)
FY	fiscal year
GEMS	Gulf Ecological Management Site
GIS	Geographic Information System
GMP	Gulf Management Program
GPS	Global Positioning System
GS	grade scale
GSA	General Services Administration
HMP	habitat management plan
IPCC	Intergovernmental Panel on Climate Change
LCC	Landscape Conservation Cooperative
MAB	Man and Biosphere Program
MEP	Minor Expansion Proposal
MPA	Marine Protected Area
mph	miles per hour
MYA	million years ago
NAAQS	National Ambient Air Quality Standards
NABCI	North American Bird Conservation Initiative
NAGRPA	Native American Graves Protection and Repatriation Act
NAMS	National Ambient Monitoring Stations
NAWCP	North American Waterbird Conservation Plan
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NGO	non-government organization
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NRHP	National Register of Historic Places
NWFWMD	Northwest Florida Water Management District
NWPS	National Wilderness Preservation System
NWR	National Wildlife Refuge
NWRIA	National Wildlife Refuge System Improvement Act
NWRS	National Wildlife Refuge System
NWRIA	National Wildlife Refuge System Improvement Act of 1997
OFW	Outstanding Florida Waters
OPA	Otherwise Protected Area under CRBA
PFT	Permanent Full Time
PM	particulate matter
ppm	parts per million
PUNA	Public Use Natural Area
RM	Refuge Manual
RNA	Research Natural Area
RO	Regional Office

ROD	Record of Decision
RONs	Refuge Operating Needs System
RRP	Refuge Roads Program
RV	recreational vehicle
SAMMS	Service Asset and Maintenance Management System
SAV	submerged aquatic vegetation
SC	species of concern.
SCA	Student Conservation Association
SCEP	Student Conservation Employment Program
SHC	Strategic Habitat Conservation
SCWDS	Southeastern Cooperative Wildlife Disease Study
Service	U.S. Fish and Wildlife Service
SLAMM	Sea Level Affecting Marshes Model
SLAMS	State and Local Ambient Monitoring Stations (air quality)
SUP	special use permit
T	Threatened
TFT	Temporary Full Time or term appointment
TNC	The Nature Conservancy
UNESCO	United Nations Education, Scientific, and Cultural Organization
U.S.	United States of America
U.S.C	United States Code
USGS	U.S. Geological Survey
THPO	Tribal Historic Preservation Officer
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UTV	utility vehicles
WSA	Wilderness Study Area
YCC	Youth Conservation Corps (federal)

Appendix B. References and Literature Citations

- Anderson, L. 1986. Noteworthy plants from Florida. II. *Sida* 11(4): 379-384.
- Anderson, L. 1987. *Boltonia apalachicolensis* (Asteraceae): a new species from Florida. *Systematic Botany* 12: 133-138.
- Anderson, L. 1988. Noteworthy plants from north Florida. III. *Sida* 13(1): 93-100.
- Bindoff, N. L., J. Willebrand, V. Artale, A. Cazenave, J. Gregory, S. Gulev, K. Hanawa, C. Le Quere, S. Levitus, Y. Nojiri, C. K. Shum, L. D. Talley and A. Unnikrishnan. 2007. Observations: Oceanic Climate Change and Sea Level. *In: Climate Change 2007: the Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.*
- Boggs, S. Jr. 2000. *Principles of Sedimentology and Stratigraphy* (3rd ed.), Prentice Hall, Upper Saddle River, New Jersey. 726 p.
- Bureau of Submerged Lands and Preserves. 1992. *Apalachicola Bay Aquatic Preserve Management Plan*. Department of Natural Resources. Tallahassee, Florida. 186pp. <http://www.dep.state.fl.us/coastal/sites/apalachicola-ap/>
- Carver, E. and J. Caudill. 2007. *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation*. Division of Economics. U.S. Fish and Wildlife Service. Washington, D.C. 435 pp.
- Center for Invasive and Aquatic Species. 2011. <http://aquat1.ifas.ufl.edu/welcome.html>.
- Center for North American Herpetology (CNAH). <http://cnah.org/>
- Chapel, G. L. Unknown date. *A Brief History of the Apalachicola Area*. Apalachicola Area Historical Society, Inc. Apalachicola, Florida. 12 pp.
- Davis, J.H., and M.F. Mokray. 2000. *Assessment of the Effect of Road Construction and Other Modifications of Surface-water Flow at St. Vincent National Wildlife Refuge, Franklin County Florida: U.S. Geological Survey Water Resource Investigations Report 00-4007*.
- Donoghue, J. F. 1993. Late Wisconsinan and Holocene depositional history, northeastern Gulf of Mexico. *Marine Geology* 112:185-205.
- Donoghue, J.F. and W.F. Tanner. 1994. *Effects of Near-Term Sedimentologic Evolution of the Lifetime of Estuarine Resources. Apalachicola River and Bay National Estuarine Research Preserve: NOAA Technical Memorandum, NOS-SRD-27*. 57 pp.

-
- Donoghue, J. F., and N. M. White. 1995. Late Holocene sea-level change and delta migration, Apalachicola River region, northwest Florida, USA: *Journal of Coastal Research*, 11(3): 651-653.
- Doyle, T. W. 1998. Modeling global climate change effects on coastal forests, *in* G.R. Guntenspergen and B. A. Vairin, eds., *Vulnerability of coastal wetlands in the southeastern United States: Climate change research results, 1992-97*: U.S. Geological Survey, Biological Resources Division Biological Science Report USGS/BRD/BSR -1998-0002, pp. 105.
- Edmiston, L. H. 2008. *A River Meets the Bay: The Apalachicola Estuarine System*. Apalachicola National Estuarine Research Reserve. Apalachicola, Florida. 190 pp.
- Emanuel, K.A. 1987. The Dependence of Hurricane Intensity on Climate. *Nature* 326: 483-485.
- Emanuel, K.A. 2005. Increasing Destructiveness of Tropical Cyclones Over the Past Thirty Years. *Nature* 436: 686-688.
- Florida Administrative Code. 2006. Surface Water Quality Standards, Rule 62-302. Florida Department of Environmental Protection. Tallahassee, Florida.
- Florida Bat Conservancy. 2011. <http://www.floridabats.org/>
- Florida Department of Environmental Protection, Apalachicola National Estuarine Research Reserve. 1998. Apalachicola National Estuarine Research Reserve Management Plan 1998-2003. Tallahassee, Florida. 277 pp.
- Florida Department of Environmental Protection, Division of Air Resource Management. 2006. 2006 Florida Air Monitoring Report. Tallahassee, Florida. http://www.dep.state.fl.us/air/air_quality/techrpt/amr06.pdf
- Florida Department of Environmental Protection. 2008. Florida's Gulf Ecological Management Sites (GEMS). Tallahassee, Florida. <http://www.dep.state.fl.us/coastal/programs/gems.htm>
- Florida Department of Environmental Protection. 2009. Air Quality Monitoring. Tallahassee, Florida. http://www.floridadep.org/air/air_quality/monitoring.htm
- Florida Department of Environmental Protection. 2009. Florida's Aquatic Preserves. Office of Coastal and Aquatic Managed Areas. Tallahassee, Florida. <http://www.dep.state.fl.us/coastal/programs/aquatic.htm>
- Florida Department of Environmental Protection. 2011. Gulf Ecological Management Site (GEMS) <http://www.dep.state.fl.us/coastal/programs/gems.htm>.
- Florida Department of Natural Resources (now Florida Department of Environmental Protection), Bureau of Submerged Lands and Preserves, Division of State Lands. January 1992. Apalachicola Bay Aquatic Preserve Management Plan. Tallahassee, Florida. 168 pp.
- Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute. Red Tides in Florida. St. Petersburg, Florida. [http://research.myfwc.com/features/view_article.asp?id"24936](http://research.myfwc.com/features/view_article.asp?id)

-
- Florida Fish and Wildlife Conservation Commission. 2003. January 6. Florida's Breeding Bird Atlas: A Collaborative Study of Florida's Birdlife. <http://www.myfwc.com/bba>.
- Florida Fish and Wildlife Conservation Commission. March 2009. FWC Fast Facts. <http://www.myfwc.com/About/AboutFastFacts.htm>
- Florida Fish and Wildlife Conservation Commission. 2005. Florida's Wildlife Legacy Initiative. Florida's Comprehensive Wildlife Conservation Strategy. Tallahassee, Florida. 472 pp. http://myfwc.com/WILDLIFEHABITATS/Legacy_StrategyDownload.htm
- Florida Fish and Wildlife Conservation Commission. 2009a. Florida's Endangered Species, Threatened Species, and Species of Special Concern. Florida Fish and Wildlife Conservation Commission. Tallahassee, Florida. 6 pp. http://www.myfwc.com/docs/WildlifeHabitats/Threatened_Endangered_Species.pdf
- Florida Fish and Wildlife Conservation Commission. 2009b. 2009-2010 Programs of the FWC. Tallahassee, Florida. 28 pp.
- Florida Legislature, Office of Economic and Demographic Research. 2009. County Profiles. Tallahassee, Florida. <http://edr.state.fl.us/county%20profiles.htm>
- Florida Natural Areas Inventory. 1990. Guide to the Natural Communities of Florida. Florida Natural Areas Inventory. Tallahassee, Florida. 111 pp.
- Florida Natural Areas Inventory. 2009. Tracking List of Rare, Threatened, and Endangered Plants and Animals and Exemplary Natural Communities in Florida. Tallahassee, Florida. <http://www.fnai.org/trackinglist.cfm>
- Florida State University. 2003. A Population and Employment Forecast for Franklin County. The Department of Urban and Regional Planning. Tallahassee, Florida. 78 pp.
- Flynn, L. B. 1990. Ecology of Sambar Deer on St. Vincent National Wildlife Refuge. Bulletin of Tall Timbers Research Station. Tallahassee, Florida. 107 pp.
- Forrest, B. M. 2007. Evolution of the beach ridge strandplain on St. Vincent Island, Florida. Ph.D. Dissertation. Florida State University. Tallahassee, Florida. 288 pp.
- Giuliano, W.M., and G.W. Tanner. 2005. Ecology of Wild Hogs in Florida. WEC-191. Department of Wildlife Ecology and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences. University of Florida. Gainesville, Florida.
- Grace, S.L. 2000. A Final Report of the Vegetation Survey and Map Project for St. Vincent National Wildlife Refuge, Apalachicola, Florida. A USFWS-USGS Research Partnership Program Project. U.S. Geological Survey. Lafayette, LA. 78pp.
- Hannah, L., T.E. Lovejoy, and S.H. Schneider. 2005. Biodiversity and Climate Change in Context. In Hannah, L. and T.E. Lovejoy., eds., Climate Change and Biodiversity. Yale University Press. New Haven, Connecticut.
- Helms, J. A. 1998. The Dictionary of Forestry. Society of American Foresters. Bethesda, Maryland. 210 pp.

-
- Holland, G.J., and P.J. Webster. 2007. Heightened tropical cyclone activity in the North Atlantic: natural variation or climate trend. *Philosophical Transactions of the Royal Society A*. <http://www.mmm.ucar.edu/people/holland/files/NaturalVariabilityOrClimateTrend.pdf> .
- Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability* in M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. Cambridge, United Kingdom. 976 pp.
- Kanaski, R. S. 2007. Historic Structure Documentation of the Pierce Complex, St. Vincent National Wildlife Refuge, Franklin County, Florida. On file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Hardeeville, South Carolina.
- Lamont, M.M., H.F. Percival, L.G. Pearlstine, S.V. Colwell, W.M. Kitchens, and R. R. Carthy. 1997. The Cape San Blas Ecological Study: US Geological Survey/Biological Resources Division, Florida Cooperative Fish and Wildlife Research Unit. Technical Report No. 57. 209 pp.
- Lopez, G.I. and W.J. Rink. 2008. New quartz optical stimulated luminescence ages for beach ridges on the St. Vincent Island Holocene strandplain, Florida, United States. *Journal of Coastal Research*, 24(1A), 49–62.
- Mann, M.E. and K.A. Emanuel. 2006. Atlantic Hurricane Trends Linked to Climate Change. *Eos, Transactions of American Geophysical Union* 87(24): 233, 238, 241.
- McAtee, W.L. 1913. A List of Plants Collected on St. Vincent Island, Florida. *Proceedings of the Biological Society of Washington, Smithsonian Institute* 25: 39-52.
- McCarty, J. P. 2001. Ecological Consequences of Recent Climate Change. *Conservation Biology* 15: 320-331.
- McKeown, H. A., P. J. Bart, and J. B. Anderson. 2004. High resolution stratigraphy of a sandy, ramp-type margin, Apalachicola, FL, U.S.A. In J.B. Anderson and R. H. Fillon, eds. *Late Quaternary stratigraphic evolution of the northern Gulf of Mexico margin*. Special Publication – Society for Sedimentary Geology, vol. 79, pp.25-41.
- Miller, J. J., J. W. Griffin, M. L. Fryman, and F. W. Stapor. 1981. Archeological and Historical Survey of St. Vincent National Wildlife Refuge, Florida. U.S. Fish and Wildlife Service, Contract A-5831(79). Tallahassee, Florida. 101 pp.
- Natural Resources Conservation Service. 2010. Web Soil Survey. US Department of Agriculture. <<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>>
- National Oceanic and Atmospheric Administration and U.S. Fish and Wildlife Service. 2003. Designation of Critical Habitat for the Gulf Sturgeon: Final Rule, March 19, 2003. *Federal Register* 68(53):13370-13495.
- National Oceanic and Atmospheric Administration. 2008. Global Climate Change Impacts in the U.S. (Draft). Department of Commerce. <http://www.climate-science.gov/Library/sap/usp/public-review-draft/>

-
- Natural Resources Defense Council. 2001. Feeling the Heat in Florida: Global Warming on the Local Level. 27 pp. <<http://www.nrdc.org/globalwarming/florida/flainx.asp>>
- National Oceanic and Atmospheric Administration. 2009. National Estuarine Research Reserve System. <http://nerrs.noaa.gov/>
- Natural Resources Conservation Service. 2010. Web Soil Survey. U.S. Department of Agriculture. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>
- Nicholls S., B. Amelung, and D. Viner. 2007. Implications of Global Climate Change for Tourism Flows and Seasonality *Journal of Travel Research* 45: 285-296.
- Parker, G. 1995. *Eastern Coyote: The Story of Its Success*. Nimbus Publishing. Halifax, Nova Scotia, Canada. 254 pp.
- Parmesan, C. and G. Yohe. 2003. A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems. *Nature* 421: 37-42.
- Parmesan, C. 2006. Ecological and Evolutionary Responses to Recent Climate Change. In *Annual Review of Ecology, Evolution, and Systematics*. 37: 637-669.
- Raney, D. C., I. Huang, and H. Urgan. 1985. Hydrodynamic and salinity model for Apalachicola Bay, Florida. Report for Mississippi-Alabama Consortium Sea Grant. University of Alabama, College of Engineering/Bureau of Engineering Research, Tuscaloosa, Alabama. 84 pp.
- Ratnaswamy, M.J., and Warren, R.J. 1998. Commemorative Issue Celebrating the 50th Anniversary of "A Sand County Almanac" and the Legacy of Aldo Leopold. *Wildlife Society Bulletin* 26(4): 846-850.
- Root, T.L., J.T. Price, K.R. Hall, S.H. Schneider, C. Rozenzweig, and J.A. Pounds. 2003. Fingerprints of Global Warming on Wild Animals and Plants. *Nature* 421: 57-60.
- Sasser, L.D., K.L. Monroe, and J.N. Schuster. 1994. Soil Survey of Franklin County, Florida. U.S. Department of Agriculture, Soil Conservation Service, University of Florida, and Florida Department of Agriculture and Consumer Services. Gainesville, Florida. 192 pp.
- Schaefer, J. and M.B. Main. 1997. Florida's White-Tailed Deer. WEC-133. Department of Wildlife Ecology and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Gainesville, Florida. .
- Schuster, J.N. 2001. Soil Survey of Gulf County, Florida. U.S. Department of Agriculture, Soil Conservation Service, University of Florida and Florida Department of Agriculture and Consumer Services. Gainesville, Florida. 201 pp.
- Southeastern Cooperative Wildlife Disease Study. 2003. <http://www.uga.edu/scwds/yabsleypersonalbio.html>
- Stapor, F.W. 1973. Coastal Sand Budgets and Holocene Beach Ridge Plain Development, Northwest Florida. Tallahassee, Florida: Florida State University, Ph.D. thesis, 221pp.

-
- Stapor, F.W. and W.F. Tanner. 1977. Late Holocene Mean Sea Level Data from St. Vincent Island and the Shape of the late Holocene Mean Sea Level Curve. Coastal Sedimentology Proceedings of the 1977 Symposium on Nearshore Sedimentation. Florida State University. Tallahassee, Florida. pp. 35-68.
- Tanner, W. F. 1964. History of the Appalachian geosyncline area. Special Paper - Geological Society of America. pp.259-260.
- Tempel, D.A. Cilimburg, and V. Wright. 2003. The Status and Management of Invasive Species in National Wildlife Refuge Wilderness Areas. Aldo Leopold Wilderness Research Institute. 42 pp. <http://leopold.wilderness.net/research/invasives/invaders.htm>
- Thompson, D. 1970. Vegetative Cover Types of St. Vincent Island Refuge. Unpublished Report to St. Vincent National Wildlife Refuge, Apalachicola, Florida.
- U.S. Census Bureau. 2009. State and County QuickFacts. Data derived from Population Estimates, Census of Population and Housing, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report. <http://quickfacts.census.gov/qfd/states/12000.html>
- U.S. Environmental Protection Agency (EPA). 2011. Gulf of Mexico Program. <http://www.epa.gov/gmpo/>.
- U.S. Department of Energy (DOE). 1999. Center for Research on Enhancing Carbon Sequestration in Terrestrial Ecosystems. http://csite.esd.ornl.gov/1999_CSiTE_proposal_for_openwebsite.pdf.
- U.S. Department of the Interior. 2008. Report to Congress: John H. Chafee Coastal Barrier Resources System Digital Mapping Pilot Project. Washington, D.C. 183 pp.
- U.S. Fish and Wildlife Service. 1982. Eastern Indigo Snake Recovery Plan. U.S. Fish and Wildlife Service. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 1996. Revised Recovery Plan for the U.S. Breeding Population of the Wood Stork. U.S. Fish and Wildlife Service. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 2001. Florida Manatee Recovery Plan, (*Trichechus manatus latirostris*), Third Revision. U.S. Fish and Wildlife Service. Atlanta, Georgia.
- U.S. Fish and Wildlife Service. 2002 Coastal Barrier Resources Act. U.S. Fish and Wildlife Service. 48pp. <http://www.fws.gov/CBRA/Act/index.html>.
- U.S. Fish and Wildlife Service. 2006. Red Wolf Pamphlet.
- U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2006. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. http://library.fws.gov/pubs/nat_survey2006_final.pdf.
- U.S. Fish and Wildlife Service. 2007. Friends and Volunteers Annual Update FY 2006: People Making a Difference. Washington, D.C. 4 pp.

-
- U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. U.S. Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management. Arlington, Virginia. 85 pp. <http://www.fws.gov/migratorybirds/>
- U.S. Fish and Wildlife Service. April 2009. Capacity Building for Landscape Conservation (Draft). 11 pp.
- U.S. Fish and Wildlife Service. Summer 2009. Red Wolf Journal. 5 pp.
- U.S. Geological Survey (USGS). Southeastern Amphibian Research and Monitoring Initiative. http://fl.biology.usgs.gov/Amphibians_and_Reptiles/amphibians_and_reptiles.htm.
- Walker, Karen J., Frank W. Stapor, and William H. Marquardt. 1995. Archaeological Evidence for a 1750-1450 Higher-than-present Sea Level Along Florida's Gulf Coast. *Journal of Coastal Research Special Issue (17)*: 205-218.
- Webster, P.J., et al. 2005. Changes in Topical Cyclone Number, Duration, and Intensity in a Warming Environment. *Science* 309(5742): 1844-1846.
- White, Nancy M. 2009. Archeological Investigation, Public Education, and Cultural Resources Monitoring on St. Vincent Island National Wildlife Refuge: Application Proposal for Archaeological Resources Protection Act Permit. University of South Florida. Tampa, Florida.
- Wunderlin, R. P. 1997. Guide to the vascular plants of Florida. University Press of Florida, Gainesville, FL. 806 pp.
- Zhang, K., B.C. Douglas, and S.P. Leatherman. 2004. Global Warming and Coastal Erosion. *Climatic Change*. Florida International University, Miami, Florida. 64: 41-58. <http://www.dvqu.ru/meteo/library/5149871.pdf>.

Appendix C. Relevant Legal Mandates and Executive Orders

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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.

STATUTE	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
<p>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.</p>	<p>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.</p>
<p>EO 12962, Recreational Fisheries (1995)</p>	<p>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.</p>
<p>EO 13007, Native American Religious Practices (1996)</p>	<p>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.</p>
<p>EO 13061, Federal Support of Community Efforts Along American Heritage Rivers (1997)</p>	<p>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.</p>
<p>EO 13084, Consultation and Coordination With Indian Tribal Governments (2000)</p>	<p>Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.</p>
<p>EO 13112, Invasive Species (1999)</p>	<p>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).</p>

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.
EO 13443, Facilitation of Hunting Heritage and Wildlife Conservation (2007)	Directs federal agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitats.
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.

EXECUTIVE ORDERS	DESCRIPTIONS
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.
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.

EXECUTIVE ORDERS	DESCRIPTIONS
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).
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.

SECRETARIAL ORDERS	DESCRIPTIONS
<p>3289A1 –Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources</p> <p>February 22, 2010</p>	<p>This Order provides guidance to bureaus and offices within the Department of the Interior (DOI) on how to provide leadership by developing timely responses to emerging climate change issues. This Order replaces Secretarial Order No. 3226, signed on January 19, 2001, entitled “Evaluating Climate Change Impacts in Management Planning.” It is intended to reaffirm efforts within DOI that are ongoing with respect to this important issue. Specific provisions include:</p> <p>Each DOI bureau and office must consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans (CCPs), and making major decisions regarding potential use of resources under the Department’s purview.</p>

	<p>DOI will develop landscape-level strategies for understanding and responding to climate change impacts. Interior bureaus and agencies, guided by the Energy and Climate Change Council, will work to stimulate the development of a network of collaborative "Landscape Conservation Cooperatives." These cooperatives will work interactively with the relevant DOI Climate Science Center(s) and help coordinate adaptation efforts in the regions.</p>
<p>3305 – Ensuring Scientific Integrity Within the Department of Interior (DOI)</p> <p>September 29, 2010</p>	<p>This directs the establishment of Department-wide policy to guide and ensure the integrity of science and scientific products developed and used by DOI in decision making and in the creation of policy related to the conservation and responsible development of our Nation's natural resources, protecting our heritage, and honoring native cultures and tribal communities. This policy has been incorporated in 305 DM 3.</p>
<p>3270 – Adaptive Management</p> <p>March 9, 2007</p>	<p>This Order provides policy guidance and procedures for implementing adaptive management. It was superseded by the 522 Department Manual (DM) 1 on February 1, 2008.</p>

Appendix D. Public Involvement

SUMMARY OF PUBLIC SCOPING COMMENTS

A notice of intent (NOI) to prepare a comprehensive conservation plan (CCP) for St. Vincent National Wildlife Refuge (NWR) was published in the *Federal Register* on April 8, 2009. Following publication of the NOI, the public was informed and their input was solicited through a variety of mechanisms. CCP information was posted on the refuge's website, kiosks, and at St. Vincent NWR and St. Marks NWR. In addition, notices regarding the refuge's CCP were published in the following local and regional newspapers: *The Apalachicola & Carrabelle Times*, *The Star*, and *Tallahassee Democrat*. Flyers containing information about the refuge's CCP and upcoming public scoping meetings were posted at local libraries, post offices, parks, and businesses. Invitations to the public scoping meeting were also mailed and emailed to interested groups and citizens.

Two public scoping meetings were held in July 2009, one at the St. Joe Bay State Buffer Preserve in Gulf County, Florida, and a second at the Apalachicola Community Building in Franklin County, Florida. The Gulf County meeting had 28 in attendance and 6 Service personnel. Sixteen citizens attended the Franklin County meeting, along with 6 Service personnel. At each meeting, Service staff provided a presentation on the refuge and the comprehensive planning process. The public was then given the opportunity to submit comments and concerns verbally and written regarding the future management of the refuge. Throughout the commenting period the refuge received 30 responses. The refuge sincerely appreciates those who took the time to attend the meetings or submit comments. These comments are helpful to the staff in determining the direction of management and ways for the refuge to become a more enjoyable place to visit and experience nature.

The issues identified during the scoping process are summarized below.

Intergovernmental Partners (including Florida Fish and Wildlife Conservation Commission)

The intergovernmental scoping team discussed a range of issues and developed a list of the top priorities as follows:

- Control exotic species (particularly feral hogs) combined with education
- Manage island habitats with prescribed fire
- Protect rare/ threatened/endangered species
- Manage for migratory birds
- Increase outreach
- Support partnerships
- Evaluate forest management (even aged timber issue)
- Support recreational uses – particularly hunting

Comments from the Public

The issues, ideas, concerns, and comments raised by the public were diverse and ranged from those addressing biological resources to those involving public use and administration of the refuge. Some of the reoccurring thoughts were:

- Continue habitat restoration work
- Need for hog control
- Need for more education/ public awareness

-
- Hire a biologist
 - Address limited accessibility
 - Acquire more funding
 - Allow more partnerships – education, research, access, Friends group relationship
 - Lack of Law Enforcement

Fish and Wildlife Populations

- Prefer a let-alone policy as far as flora and fauna are concerned
- No new fauna should be introduced
- The island is important to herpetology
- Work with National Wild Turkey Federation to restock wild turkeys
- Continue Breeding Bird Surveys (BBS) and Christmas Bird Surveys to see trends in the data
- Start a sea turtle egg hatching program
- Reintroduce Indigo snakes
- Continue to support current endangered/ protected species (outstanding successful red wolf program, sea turtles, bald eagles, and gopher tortoises)
- Restock wild turkeys on the island
- Continue red wolf program

Habitat Management

- Botany on the island needs to be considered
- Address lake levels for optimizing bird nesting
- Look at fire management from the angle for migratory birds needs
- Amphibians need fresh water. Increase the freshwater acreage on SVNWR.
- Continue habitat restoration work
- Continue to revert refuge to its historical environmental characteristics
- Need to continue habitat restoration
- Prescribed fire needs to continue to move towards a 2-5 year growing season (late April-July) burn rotation for the island. Prescribed fire needs to be conducted during weather that will produce fire that closely mimics natural intensities.

Invasive, Exotic, and Nuisance Plant and Animal Control

- Need to do something to reduce the hog population
- Hogs need to be hunted – let children have a hog hunt
- Need to decrease hog population but you need a biologist
- Feral pigs should be eliminated
- Hog management – instead of random killing of hogs allow hunters more opportunities (more hunts, modern firearms)
- Not very concerned about the proposal to eliminate hogs from the island. There are plenty of hogs around at other places to hunt
- Control hogs
- Sambar deer – close the hunting season for 2 years to allow for recovery
- Need fire ant mitigation and invasive species removal
- Feral hogs should not be managed as a game species anywhere. Like to see a detailed, long range eradication plan for hogs.

Visitor Services

- Supports wildlife watching and against wildlife hunting
- Want to see preservation of traditional recreational uses of the island, especially hunting and minimize the conflicts between traditional hunting activities and the red wolf program
- Address the need and desires for disabled people to access the island and enjoy it as well

Hunting

- Annual hunts for fauna population control are legitimate if controlled
- Allow a few permits to hunt alligators
- Schedule archery hunt later in the season as it was previously
- Consider making Road 4 the dividing line on meat runs (IP hunters will have pick up from Road 4 to the west and WP hunters Road 4 to the east)
- Thank you to the no alcohol rule
- Use employees on the meat run instead of volunteers
- Continue with three hunts as needed

Fishing

- Manage freshwater lakes to the level they once were

Wildlife Observation

- Need to have more wildlife observation opportunities
- 14 Mile site needs an observation tower and trail

Environmental Education and Interpretation

- Keep the island available and accessible to schools and other educational groups
- Have classes for adults on the island (possibly 6 week classes) covering things like natural plants, migratory birds, erosion, and archeology
- Education is a must
- Education - need to get kids to the refuge
- Periodic tours for support group members are a good idea at 6 month intervals
- Education programs given by staff and volunteers need to be offered with frequency and at outreach locations as well as the monthly tours by the Friends group
- Reach out to the children and adults in the local communities

Public Awareness

- Create website for youth related to the refuge
- Need more information on programs on website (sea turtle nesting results on the web, wolf production information if possible on the web)
- Need to have local red wolf information (island population) in a pamphlet
- Create a small all-color booklets covering the wildlife of SVNWR

Cultural Resources

- Need to compile information on past artifact collections from St. Vincent Island and prevent any more such collections
- Establish a monitoring program with the Supporters of St. Vincent NWR
- Put better (or any) signs along the north and east shore that clearly state the law concerning cultural resources and the *penalties* for picking up prehistoric pottery and stone artifacts
- Insert a section into the visitors' brochure/map that indicates it is illegal to pick up artifacts and the penalties for breaking the law

-
- Start a program of periodic monitoring by refuge staff of the archaeological sites, both on a regular basis and after big storms or other events that might expose more shoreline
 - Plan a primary cultural resources survey on the Pig Island and mainland tract areas, just to inventory what archaeological sites are there in the first place, so they can be protected
 - Recognize the importance of cultural resources on the refuge and how they are just as crucial as natural resources
 - Recognize that prehistoric cultural resources on the refuge are more numerous and possibly more significant than the few historic sites/structures
 - Work with archaeologists and repositories to achieve proper curation and management of archaeological collections from the refuge so they can be scientifically useful
 - Hold a workshop for refuge staff and other interested parties to explain the laws and the monitoring program, the distribution of archaeological sites, the locations of each of them, and the best way to protect them or at least conserve the scientific information in them
 - Support archaeological research that utilizes the refuge sites, materials, and data to investigate past human systems
 - Continue to support Native American artifacts and historical structures by continuing to document island historical artifacts

Law Enforcement

- Need law enforcement help
- Lack of law enforcement is frustrating to say the least to the local community
- Better signage restricting access to the shore bird nesting area is needed

Accessibility

- Consider using a small number of guide groups for solving public hunting and fishing, birding and photography needs to and on the refuge
- Need to develop 14 Mile site as a refuge access point
- Present policy of limited free public access seems to be working well
- Public should be allowed to visit but not stay overnight as long as they can get there and return by themselves
- Don't think access should be significantly increased. No concessions. No overnight camping
- Removal of roads, limited access

Land Acquisition

- Obtain management power over Flag Island (Bird Island) off shore of St. Vincent to protect migratory birds
- Need barge access site (permanent protected)
- Like to see a refuge lands expansion proposal (expanding St. Vincent northward into St. Vincent Sound/Lake Wimico).

Research

- Complete an unbiased study showing the number of sea turtle and shorebird nests destroyed by red wolves
- St. Vincent NWR presents one of the greatest biological opportunities for research in the southeastern United States because it is an island with limited human access

-
- Herpetological conservation projects that might be considered:
 - Re-introduction of Eastern indigo snakes (*Drymarchon couperi*).
 - A study of the Eastern diamondback rattlesnake (*Crotalus adamanteus*) on the island
 - A study of the population dynamics and status of the state-protected gopher tortoises (*Gopherus polyphemus*) on the island
 - A study of the status of the diamondback terrapin (*Malaclemys terrapin*) on the island
 - A study of the salt marsh snake (*Nerodia clarkii*) on the island
 - Address and support beneficial projects/research work on St. Vincent

Partnerships

- Partner to connect the refuge to kids
- Work with Florida State University (Dr. Emily Moriarty Lemmon) with amphibian research needs
- Having a permanent contract with St. Vincent Shuttle Service to transport authorized field biologists to SVNWR would be useful, and would relieve Dale of having to take folks over in the barge

Administration

- Continue request for funds – need to shift some of St. Marks NWR's resources to St. Vincent NWR
- Put in the document the number of hours of St. Marks NWR staff time that will help St. Vincent NWR
- All staff needs to interact in the field once a week to better understand, perform, and support the refuge and co-workers
- Close office in Apalachicola
- Oppose new building structures or infrastructure
- Occasionally sending St. Marks NWR staff to help out with lack of daily observations in a unique and constant changing environment of St. Vincent as a barrier island, with vast habitat, wildlife, historical Native American artifacts, and endangered species seems to be a poor plan
- Emergency concerns – severely limited St. Vincent staff in Apalachicola would be overwhelmed if forced to address an emergency alone
- Monthly trash collection by support group volunteers should be supported with vehicles, trash bags, disposal and fuel
- Charging sportsman for hunts while other users get a free ride is shameful; Charge the other user groups that pay nothing
- A better system of roads might be adopted for the island, possibly one with fewer roads than at present, but also more strategically located than the current ones
- Upgrading and enlarging the cabin to create a small field research station - more modern means of generating heat and electricity such as wind and solar
- Federal government is failing in its public responsibility to adequately manage St. Vincent NWR due to the severe lack of funding/adequate staff/law enforcement and improving broken island equipment
- There is a lack of responsibility from Federal Government in not replacing departing staff from St. Vincent NWR and moving supervision and overall management to another refuge. Currently a highly questionable management plan for public lands and its personnel.

Staffing

- Need to hire a biologist
- Fund and staff at least one full-time biologist whose sole responsibility is St. Vincent NWR
- Need on-site bio-technician, full-time biologist, and law enforcement

General Comments

- St. Vincent NWR needs to be listed as a refuge of special concern because it has survived thousands of years, and may be the last of such habitat not impacted by surrounding road traffic.
- Do not ever let the island get sold to developers
- Constructive and destructive forces of nature have already written the best possible CCP for St. Vincent NWR
- Least disturbance possible is usually the best course
- Facilities for visitation, introduction and reintroduction of species, destruction of existing species (except certain invasive and destructive species), and attempts to control natural forces are all doomed to ultimate failure
- Delete the goal of climate change or make it very general or you may be limited in your management options in the future
- Makes it one of the few places in the southeastern United States where conservation of sensitive species can be maintained and controlled on an ongoing basis (i.e., the red wolves, etc.)

Appendix E. Appropriate Use Determinations

St. Vincent 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 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: St. Vincent National Wildlife Refuge

Use: Hiking, Jogging, Walking and Bicycling

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: St. Vincent National Wildlife Refuge

Use: Camping Associated with Hunting

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: St. Vincent National Wildlife Refuge

Use: Firewood Gathering Associated with Hunting

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: St. Vincent National Wildlife Refuge

Use: General Research and Scientific Collection

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: St. Vincent National Wildlife Refuge

Use: Commercial Guided Wildlife Observation Tours and Fishing

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** ___ **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.

Appendix F. Compatibility Determinations

St. Vincent National Wildlife Refuge Compatibility Determinations

Uses: The following public uses were found to be Appropriate Uses (see Appendix E) for St. Vincent National Wildlife Refuge. Unless otherwise noted, these uses are allowed only on the non-closed portions of refuge lands on St. Vincent Island, 14 Mile Administrative site, and Pig Island. Each use listed below was evaluated to determine whether it is compatible with the mission of the Refuge System and the purposes of the refuge. A description of each use and its anticipated biological impacts is presented in these compatibility determinations. The following are proposed as compatible uses:

1. Hunting - Big Game
2. Recreational Fishing
3. Environmental Education and Interpretation
4. Wildlife Observation and Photography
5. Hiking, Jogging, Walking, and Bicycling
6. Boating - No gas motors (canoeing and kayaking)
7. Camping Associated with Hunts
8. Firewood Gathering Associated with Hunting
9. General Research and Scientific Collecting
10. Beach Use and Shelling

For brevity, the following sections pertain to each use/description of use, but the text is not repeated for each of the 11 uses comprising this appendix. They are a part of each compatibility determination and become a part of that compatibility determination if printed, filed or referred to apart from the comprehensive conservation plan.

Refuge Name: St. Vincent National Wildlife Refuge

Date Established: July 9, 1968

Establishing and Acquisition Authorities: Migratory Bird Conservation Act

Refuge Purpose: ... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds. 16 U.S.C. 715d (Migratory Bird Conservation Act)

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)
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; 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)
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
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)
Code of Federal Regulations, Title 50, Parts 25-33, Subchapter C; Title 43 CFR 3101.3-3
Emergency Wetlands Resources Act of 1986 (S.B. 740)
North American Wetlands Conservation Act of 1990
Food Security Act (Farm Bill) of 1990 as amended (H.R. 2100)
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
Archaeological Resources Protection Act of 1979
Native American Graves Protection and Repatriation Act of 1990

The Improvement Act of 1997 (herein called the Improvement Act) set national priorities for public uses within the collection of refuge system lands. Six priority public uses were identified: hunting, fishing, environmental education, interpretation, wildlife observation, and photography. These management uses are identified in the Comprehensive Conservation Plan, Chapter 4, under the Visitor Services Goal.

Description of Use:*Hunting - Big Game*

Big game hunting includes hunting for white-tailed deer, sambar deer, and feral hogs by means of primitive weapon. Recreational hunting, a wildlife-dependent activity, is a priority public use under the Improvement Act, provided it is compatible with the purpose for which the refuge was established.

Availability of Resources: The costs to run a hunt program include the printing of permits, administration, monitoring, law enforcement, and safe access-point maintenance. The hunt program is supported by annual operation and maintenance funds. Additional fees are generated from hunter user fees, i.e., fees collected for the hunt permits.

Anticipated Impacts of the Use: While managed hunting opportunities result in both short- and long-term impacts to individual animals, effects at the population level are usually negligible. The refuge hunting program is regulated by staff using hunt data. As currently proposed, the known and anticipated levels of disturbance by allowing hunting are considered minimal and well within the tolerance of known populations present on the refuge. Monitoring activities will be used and public use programs will be adjusted as needed to maintain habitat, wildlife populations and quality public use programs. Reduction of feral hogs by public hunting is part of an integrated control program for this species and is beneficial to native wildlife. Hunting of white-tailed deer and Sambar deer helps maintain populations at healthy levels commensurate with the habitat.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Hunting seasons are established annually as agreed upon during the annual hunt coordination meeting of refuge and state wildlife agency partners. All hunters are required to possess a signed refuge hunting permit while participating in refuge hunts. State hunting regulations apply unless otherwise listed in the permit. Only primitive weapons as defined in the hunt permit can be used.

Justification: The Improvement Act identified hunting as a priority public use on national wildlife refuges, where compatible with refuge purposes.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:
Recreational Fishing

Fishing was a traditional recreational use of the land and waters prior to their inclusion in the Refuge System and continues to be a popular recreational pursuit. Fishing is a wildlife-dependent activity designated in the Improvement Act as a priority public use, provided it is compatible with the purposes for which the refuge was established. The general regulations governing fishing on national wildlife refuges are set forth in the Code of Federal Regulations and the refuge fishing permit. Fishing is permitted to provide fishable waters to the public and to allow use of a sustainable natural resource.

Availability of Resources: Costs include permit printing, administration, maintenance, and monitoring the activity. Funding for the fishing program is borne by annual operation and maintenance funds.

Anticipated Impacts of the Use: Minor, short-term impacts to the environment from recreational fishing include litter and the possible introduction of exotic plant and animal species. Because the fish population is a sustainable, natural resource and local fish habitat is vast, no long-term impacts are expected.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: All sport fishing activities, including permitted methods of take, limits, species, and open/closed seasons, will be consistent with applicable state and refuge regulations and licensing. Enforcement efforts would be conducted by refuge federal wildlife officers. Regarding boating, no gas motors are permitted on refuge lakes in order to eliminate the threat of oil and gas contamination and reduce the chance of introducing exotic plants. Commercial fishing, limb lines, trotlines, slat traps, nets, gar sets, and jug fishing are prohibited. Sport fishing and crabbing are permitted only during daylight hours.

Justification: The Improvement Act identifies fishing as a priority public use on national wildlife refuges, where compatible with refuge purposes. Recreational fishing complies with refuge goals. It is a management objective for St. Vincent NWR, and it furthers the goals and mission of the Refuge System.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:*Environmental Education and Interpretation*

Environmental education and interpretation are priority public uses under the Improvement Act, provided they are compatible with the purpose(s) for which the refuge was established. They consist of public outreach and onsite activities conducted by refuge staff, volunteers, teachers, Friends Group members, conservation partners, university professors, and others. Most activities occur during daylight hours, with exceptions for night events, such as, owl and bat viewing. Activities include educational programs and teacher workshops carried out on nature trails, canoe trips, and at refuge observation towers, refuge areas of interest, and other areas suitable for teaching environmental science. Interpretation occurs when information is explained for the public by refuge staff or others using exhibits, displays, signs, kiosks, facilities, and brochures. Refuge facilities and lands may be used as outdoor classrooms by groups of students with a teacher and a formal plan of environmental study, by members of organizations, or by other members of the public with approval of the refuge manager.

Environmental education and interpretation activities can occur throughout the year and are conducted with the refuge's primary goals, objectives, and habitat management requirements as the guiding principles. Activities conducted under these principals allow the refuge to accomplish its management goals and also provide for the safety of visitors.

Environmental education and interpretation encourage understanding in citizens of all ages to develop land ethics, foster public support, increase visibility of the Refuge System, and improve the public's knowledge of the Service.

Availability of Resources: Funding for these activities is with the annual operation and maintenance funds for the refuge.

Anticipated Impacts of the Use: Some minimal impacts are expected, such as littering, temporary disturbance to wildlife species, and possibly some trampling of vegetation in the immediate vicinity of the activity. Most activities would take place on existing roads, trails, and facilities with no additional disturbance. Group activities would not be done where impacts would be permanent or long-lasting. Environmental education and interpretation activities are not expected to indirectly or cumulatively negatively impact refuge resources.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

Use is Not Compatible

Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Activities would be held on sites where minimal impacts will occur. Adequate precautions would be taken to ensure that educational/interpretive are an adequate distance from sensitive wildlife areas. Evaluations of sites and programs would be conducted periodically to assess if objectives are being met and that natural resources are not being degraded. If adverse impacts become evident, environmental education and interpretive activities

may need to be rotated, moved, reduced, or eliminated. Certain areas of the refuge may be restricted seasonally to avoid disturbance of breeding or nesting wildlife or to protect sensitive habitat.

Justification: The Improvement Act identifies environmental education and interpretation as priority public uses on national wildlife refuges, where compatible with refuge purposes. Environmental education and interpretation are compliant with refuge goals. They fulfill a management objective for St. Vincent NWR and further the goals and mission of the Refuge System. Environmental education and interpretation encourage understanding of ecological and biological principles and refuge-specific issues, and develop support for refuges.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Wildlife Observation and Photography

Wildlife observation and photography have been identified in the Improvement Act as priority, wildlife-dependent recreation uses provided they are compatible with the purpose(s) for which the refuge was established. Commercial videography is allowed under a special use permit with special conditions specific to those activities. Often copies are given to the refuge for use with refuge programs or publications. The general public may participate in wildlife observation and photography year-round from a half-hour before sunrise to a half-hour after sunset in the open areas of the refuge. There are no blinds or platforms designated for these activities or proposed in the CCP.

Availability of Resources: Funding for wildlife observation and photography use is supported by annual operation and maintenance funds. Costs include administration and monitoring the activity.

Anticipated Impacts of the Use: Wildlife observation and photography should not have any significant adverse biological impacts. As currently proposed, the known and anticipated levels of disturbance of allowing these activities is considered minimal and well within the tolerance level of known fish and wildlife species and populations present on the refuge. Implementation of an effective law enforcement program and development of site-specific refuge regulations that are reviewed annually should minimize most problems.

Public Review and Comment: This draft compatibility determination will available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Access to areas of the refuge identified as “Closed” during the Eagle Nesting Season or other seasonal closures must be prohibited. This use is allowed only during refuge operation hours; i.e., a half-hour before sunrise to a half-hour after sunset.

Justification: The Improvement Act identified wildlife observation and photography as priority public uses on national wildlife refuge. Wildlife observation and photography are compliant with refuge goals, fulfill a management objective for St. Vincent NWR, and further the mission of the Refuge System.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Hiking, Jogging, Walking, and Bicycling

Hiking, jogging, walking, and bicycling are not priority public uses designated by the Improvement Act. Public requests have been made to conduct these activities. They are often done in association with wildlife-dependent recreational uses, such as, photography, wildlife observation, fishing, and hunting.

Availability of Resources: No additional costs are anticipated and no special equipment, facilities, or improvements are necessary to support the use. Annual operation and maintenance funds would be used if there are any costs associated with this activity.

Anticipated Impacts of the Use: Since only non-motorized bicycles would be allowed on the refuge roads and trails, little disturbance to wildlife and habitat would occur. Currently, all trail use is low. Multiple users provide some risk to the safety of others. If complaints or safety issues arise, the uses will be re-evaluated.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Bicycling on roads is considered a low- impact activity and can be a wildlife-dependent use. Many parts of the refuge are unavailable for day use without bicycle access since distances are too great for access by foot. Hiking, jogging and walking are restricted to refuge hours (a half-hour before sunrise and a half-hour after sunset). Certain areas of the refuge may be restricted seasonally for breeding or nesting purposes or to protect habitat. Pets are prohibited.

Justification: At the present level, few bicyclists use the refuge trails. Most bicycle use is in connection with designated hunts. The trails are primarily used for photography, birding, and wildlife observation. The uses require no added expenses to regulate. They are compliant with the CCP and further the goals and mission of the Refuge System and St. Vincent NWR.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Boating - No gas motors (canoeing or kayaking)

Recreational boating is defined as manual or electric-motor propelled boating that is connected with other public use activities, such as, fishing, wildlife observation, and photography, over and adjacent to refuge-owned water bottoms. No airboats, internal-combustion-motor boats, mud boats, or air-cooled propulsion engines are allowed on refuge waters.

Availability of Resources: Costs include general permit printing, administration, and monitoring the activity. Funding for boating is supported by annual operation and maintenance funds.

Anticipated Impacts of the Use: Boating use over refuge waters for regulated public use activities in accordance with permit regulations should not have any significant adverse biological impacts. As currently proposed, the known and anticipated levels of disturbance of allowing boating, fishing is considered minimal and well within the tolerance level of known fish and wildlife species and populations present on the refuge. Implementation of an effective law enforcement program and development of site-specific refuge regulations that are reviewed annually should minimize most problems.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Airboats, mud boats, and air-cooled propulsion engines are prohibited on the refuge waters. Refuge lakes will be closed to boating seasonally to avoid conflicts with wintering waterfowl.

Justification: The Improvement Act identifies hunting, fishing, and wildlife observation and wildlife photography, as priority public uses on national wildlife refuges, where compatible with refuge purposes. Boating allows access to the refuge island and thereby facilitates the priority public uses. Recreational boating is compliant with refuge goals. It is a management objective for St. Vincent NWR which furthers the mission of the Refuge System.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Camping Associated with Hunts

Camping is only allowed during permit-regulated hunts.

Availability of Resources: Staff from the North Florida NWR Complex administers the hunt program including federal wildlife officers, biologists, visitor services specialists, and others. Costs include permit printing, administration, monitoring, law enforcement, and the maintenance of safe access points. Funding for the hunt program is supported by annual operation, maintenance funds and through hunt-permit user fees.

Anticipated Impacts of the Use: Some minimal impacts are expected, such as littering, temporary disturbance to wildlife species, and possibly some trampling of vegetation in the immediate vicinity of the activity.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Camping is restricted to permitted hunters and subject to regulation limiting location and time to avoid wildlife and habitat impacts.

Justification: Executive Order 13443 “Facilitation of Hunting Heritage and Wildlife Conservation” dated August 17, 2007, directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Departments of Interior and Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. Camping is allowed to enhance access to permitted hunts and to enhance the hunting experience.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Firewood Gathering Associated with Hunting

Camping and firewood gathering are appropriate uses only with permitted hunts, due to location of the refuge and accessibility. They are allowed to enhance the hunting experience.

Availability of Resources: There are no additional costs for this activity. Funding for the hunt program is supported by annual operation, maintenance funds and user fees (hunt permits).

Anticipated Impacts of the Use: Minimal impacts are expected, such as temporary disturbance to wildlife species and trampling of vegetation in the immediate vicinity of the activity. There is a risk of wildfires from escaped campsites or fire pits.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
- Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Firewood gathering is restricted to dead and downed material (limbs, sticks, and branches). No standing dead or live trees and no trash may be gathered and burned. Fire must be contained, burned only in immediate campsite, and manned at all times.

Justification: This activity is allowed for the comfort and convenience of hunters and it may enhance the experience of camping during public hunts. Since refuge personnel will be on the island during hunts, the risks of inappropriate collecting and wildfires should be reduced.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

General Research and Scientific Collecting

This includes scientific research, inventorying or monitoring, and scientific collecting conducted by non-refuge personnel on refuge lands. The refuge is often used for biological research, for example, by Florida State University, the University of Florida, the Florida Fish and Wildlife Conservation Commission and others.

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 the project. These are considered routine duties of biologists and managers.

Anticipated Impacts of the Use: The collection or monitoring of field data during a research project may cause habitat degradation or wildlife disturbance. Some target species may be removed or altered, but no illegal take is allowed under the Endangered Species Act. Research project impacts are minimized by strict monitoring of all projects by refuge personnel. Projects which do not further the refuge mission, purpose, or research goals may be rejected or restricted.

Public Review and Comment: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below):

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Each research proposal is reviewed by refuge staff for its usefulness and design methodology before approval is given. A special use permit is prepared for each project. It specifies the purpose and duration of the project, the 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 the study. If needed, a study can be ended or a permit rescinded if conditions are not met.

Justification: Research can provide the Service with scientific information that can be used to manage natural resources. Species identification, resource inventories, and resource monitoring can provide valuable data for refuge operations. Access to current and state-of-the-art research can aid management decisions. In general, we aim to support the research goals of our partners where study impacts are minor and temporary.

NEPA Compliance for Refuge Use Description: *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:

Description of Use:

Beach Use and Shelling

Beaches on St. Vincent NWR that are not closed to the public are available for the activities of beach use and shell 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: This draft compatibility determination will be available for review and comment during the public review period established for the Draft CCP/EA for St. Vincent NWR. All substantive comments will be addressed in the final CCP.

Determination (check one below)

- Use is Not Compatible
 Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility: Regarding shell collection, shells containing live animals (mollusks, hermit crabs) may not be taken. No live animals may be removed from shells. Certain areas of the refuge may be restricted for breeding or nesting purposes to protect habitat or to protect shorebird nesting or loafing habitat. There are currently no designated picnic sites within the refuge; however, informal picnicking and sunbathing are allowed on the beaches. Entry to and from the water for shelling, swimming, and snorkeling is allowed from the shoreline, except in posted, closed areas.

The following are prohibited for day beach use: tents and canopies, metal detectors, all pets, beach toys and games (e.g., volleyball, frisbee, badminton, football, and catch); blaring of radios, stereos, music players, or excessive noise; use of grills, barbeques, smokers, or fire pits; campfires and camping; use of portable generators; and littering or dumping of trash. Trash must be carried out. Umbrellas and chairs may not be left behind. All beach uses are restricted to refuge operation hours (a half-hour before sunrise and a half-hour after sunset).

Justification: These activities are low impact. Visiting the open, shoreline beaches through beach use supports wildlife observation.

NEPA Compliance for Refuge Use Description: *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:

Approval of Compatibility Determinations:

The signature of approval covers all the compatibility determinations considered within the Comprehensive Conservation Plan for St. Vincent National Wildlife Refuge. If one of the described uses is considered for compatibility outside of the plan, the approval signature becomes part of that determination.

Refuge Manager: _____
(Signature/Date)

Regional Compatibility
Coordinator: _____
(Signature/Date)

Refuge Supervisor: _____
(Signature/Date)

Regional Chief, National
Wildlife Refuge System,
Southeast Region: _____
(Signature/Date)

Appendix G. Intra-Service Section 7 Biological Evaluation

Originating Person: Joe Reinman
Telephone Number: 850-925-6121
Date: October 12, 2011

E-Mail: joseph_reinman@fws.gov

PROJECT NAME:

St. Vincent National Wildlife Refuge Comprehensive Conservation Plan

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:** U.S. Fish and Wildlife Service

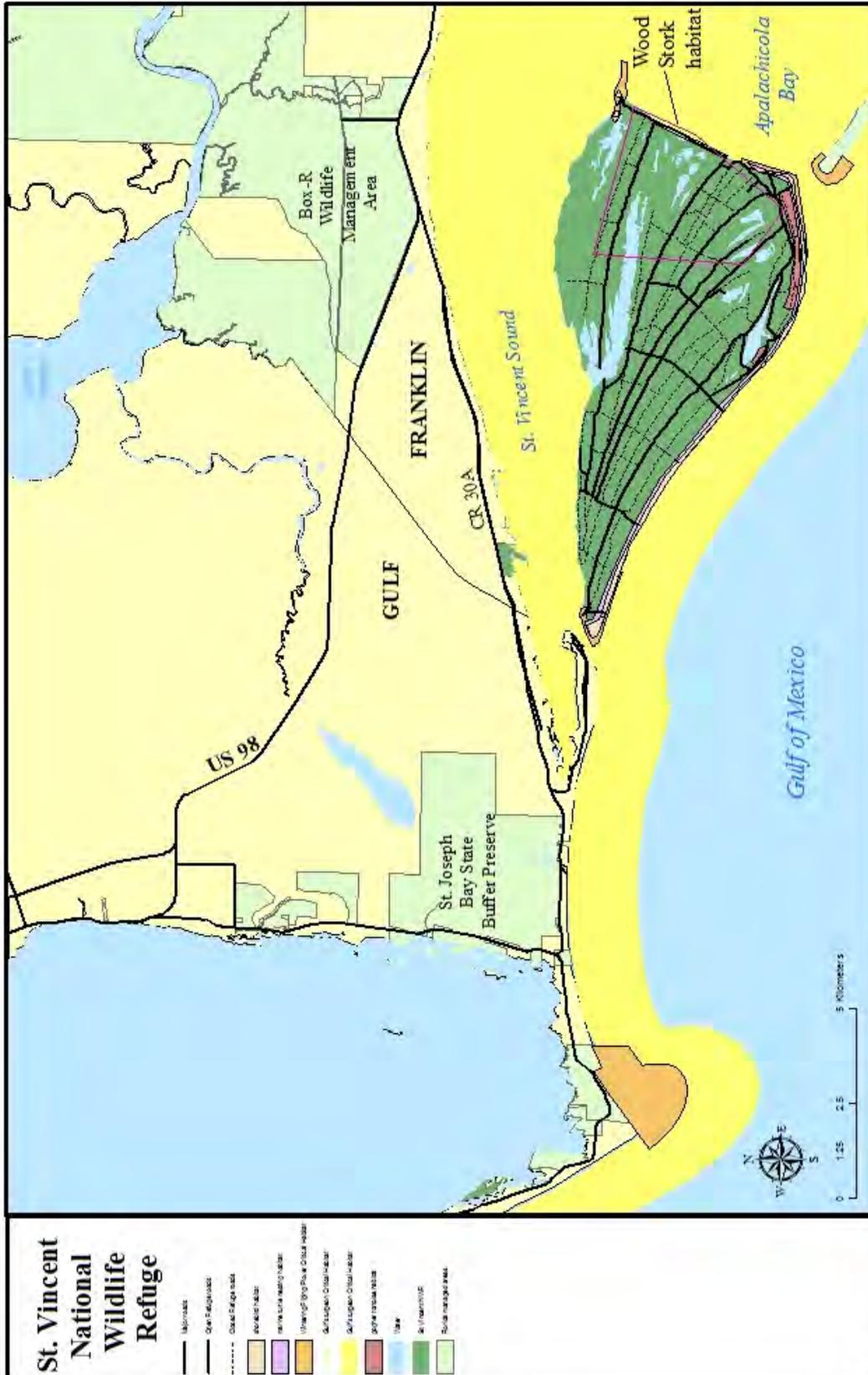
III. **Station Name:** St Vincent National Wildlife Refuge

IV. Description of Proposed Action (attach additional pages as needed):

Implement the Comprehensive Conservation Plan for St. Vincent NWR by adopting the proposed alternative. This plan directs the management of the refuge for the next 15 years.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map:



Complete the following table:

SPECIES/CRITICAL HABITAT	STATUS ¹
Eastern Indigo Snake	T
Gopher Tortoise	C
Loggerhead Sea Turtle	T
Leatherback Sea Turtle	E
Kemp's Ridley Sea Turtle	E
Green Sea Turtle	E
Florida Manatee	E
Gulf Sturgeon	T/CH
Red Wolf	E
Piping Plover	T/CH
Wood Stork	E
Red Knot	C

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location:

A. Ecoregion Number and Name: Northeast Gulf Watersheds

B. County and State: Franklin and Gulf Counties, Florida

C. Section, township, and range (or latitude and longitude):

Central Lat/Long for St. Vincent NWR

29 39' 40"N 85 07' 45"W

D. Distance (miles) and direction to nearest town:

St. Vincent NWR is 9 miles SW of Apalachicola, Florida.

E. Species/habitat occurrence:

Indigo snakes were once found on the island upland habitats, but are not presently known to exist there in recent years.

Gopher tortoises have a small population in older dune areas on the southeastern portion of the island.

Loggerhead sea turtles commonly lay 40-60 nests annually on the beaches along the southern edge of the island and are common in the bay and gulf waters.

Green, leatherback, and Kemp's Ridley sea turtles are less common residents of the bay and gulf waters. Green and leatherback sea turtles are extremely rare nesters on the island.

Florida Manatees are uncommon residents of the gulf and bay waters during the warmer months.

Gulf sturgeon are seasonal residents of the gulf and bay waters.

St. Vincent Island serves as an island propagation site for a pair/family of red wolves. The wolves range over the entire island, utilizing most upland habitats.

Piping plovers are primarily occasional wintering residents on the island's beaches, although sightings have occurred throughout the year.

Wood storks are uncommon residents of island and surrounding wetlands from spring through fall and occasional during the winter.

Red knots are uncommonly found on the island's beaches year-round.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. B.

SPECIES/CRITICAL HABITAT	IMPACTS TO SPECIES/CRITICAL HABITAT
Eastern Indigo Snake	The project is not likely to adversely affect the species
Gopher Tortoise	The project is not likely to adversely affect the species
Loggerhead Sea Turtle	The project is not likely to adversely affect the species
Leatherback Sea Turtle	The project is not likely to adversely affect the species
Kemp's Ridley Sea Turtle	The project is not likely to adversely affect the species
Green Sea Turtle	The project is not likely to adversely affect the species
Florida Manatee	No effect
Gulf Sturgeon	No effect
Red Wolf	The project is not likely to adversely affect the species
Piping Plover	The project is not likely to adversely affect the species
Wood Stork	The project is not likely to adversely affect the species
Red Knot	The project is not likely to adversely affect the species

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/ CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE IMPACTS
Eastern Indigo Snake	No actions needed or planned
Gopher Tortoise	No actions needed or planned
Loggerhead Sea Turtle	No actions needed or planned
Leatherback Sea Turtle	No actions needed or planned
Kemp's Ridley Sea Turtle	No actions needed or planned
Green Sea Turtle	No actions needed or planned
Florida Manatee	No actions needed or planned
Gulf Sturgeon	No actions needed or planned
Red Wolf	No actions needed or planned
Piping Plover	No actions needed or planned
Wood Stork	No actions needed or planned
Red Knot	No actions needed or planned

VIII. Effect Determination and Response Requested:

SPECIES/CRITICAL HABITAT	DETERMINATION			RESPONSE REQUESTED
	NE	NA	AA	
Eastern Indigo Snake		X		Concurrence
Gopher Tortoise		X		Concurrence
Loggerhead Sea Turtle		X		Concurrence
Leatherback Sea Turtle		X		Concurrence
Kemp's Ridley Sea Turtle		X		Concurrence
Green Sea Turtle		X		Concurrence
Florida Manatee	X			Concurrence
Gulf Sturgeon	X			Concurrence
Red Wolf		X		Concurrence
Piping Plover		X		Concurrence
Wood Stork		X		Concurrence

¹DETERMINATION/RESPONSE REQUESTED:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

Signature (originating station)

Date

Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence _____ Nonconcurrency _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

Signature

Date

Title

Office

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 St. Vincent National Wildlife Refuge were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964. No lands in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this plan.

Appendix I. Refuge Biota

BIRDS

ST. VINCENT NWR – BIRD LIST

The following list includes those species known to have occurred on the refuge through documented sightings.

Seasonal appearance

SP -Spring: March - May

SU -Summer: June - August

F -Fall: September - November

W -Winter: December – February

Seasonal abundance

a-abundant - A common species which is very numerous

c-common - Certain to be seen or heard in suitable habitat

u-uncommon - Present, but not certain to be seen

o-occasional - Seen only a few times during a season

r-rare - Seen at intervals of 2 to 5 years

x-accidental - Generally considered out of species normal range

* Has nested on refuge

+ No longer occur on refuge

@ Exotic species not native to the area

Common Name	Scientific Name	SP	SU	F	W
<i>Waterfowl</i>					
Wood Duck*	<i>Aix sponsa</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>a</i>
Northern Pintail	<i>Anas acuta</i>	<i>o</i>		<i>o</i>	<i>o</i>
American Wigeon	<i>Anas americana</i>	<i>u</i>		<i>u</i>	<i>u</i>
Northern Shoveler	<i>Anas clypeata</i>	<i>u</i>		<i>u</i>	<i>u</i>
Green-winged Teal	<i>Anas crecca</i>	<i>c</i>		<i>c</i>	<i>c</i>
Blue-winged Teal	<i>Anas discors</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Mottled Duck	<i>Anas fulvigula</i>		<i>r</i>	<i>r</i>	<i>r</i>
Mallard	<i>Anas platyrhynchos</i>	<i>o</i>		<i>o</i>	<i>u</i>

Common Name	Scientific Name	SP	SU	F	W
American Black Duck	<i>Anas rubripes</i>	<i>r</i>		<i>r</i>	<i>o</i>
Gadwall	<i>Anas strepera</i>	<i>u</i>		<i>u</i>	<i>u</i>
Greater white-fronted Goose	<i>Anser Albifons</i>				<i>x</i>
Lesser Scaup	<i>Aythya affinis</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Redhead	<i>Aythya americana</i>	<i>u</i>		<i>u</i>	<i>u</i>
Ring-necked Duck	<i>Aythya collaris</i>	<i>u</i>		<i>u</i>	<i>u</i>
Greater Scaup	<i>Aythya marila</i>	<i>o</i>	<i>r</i>	<i>o</i>	<i>o</i>
Canvasback	<i>Aythya valisineria</i>	<i>o</i>		<i>o</i>	<i>o</i>
Canada Goose	<i>Branta canadensis</i>	<i>r</i>		<i>r</i>	<i>r</i>
Bufflehead	<i>Bucephala albeola</i>	<i>c</i>		<i>c</i>	<i>c</i>
Common Goldeneye	<i>Bucephala clangula</i>	<i>u</i>		<i>u</i>	<i>u</i>
Snow Goose	<i>Chen caerulescens</i>			<i>u</i>	<i>o</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>	<i>u</i>		<i>c</i>	<i>c</i>
Black Scoter	<i>Melanitta americana</i>	<i>u</i>		<i>o</i>	<i>u</i>
White-winged Scoter	<i>Melanitta fusca</i>	<i>u</i>		<i>o</i>	<i>u</i>
Surf Scoter	<i>Melanitta perspicillata</i>	<i>u</i>		<i>o</i>	<i>u</i>
Red-breasted Merganser	<i>Mergus serrator</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>	<i>o</i>		<i>o</i>	<i>o</i>
Loons					
Common Loon	<i>Gavia immer</i>	<i>c</i>	<i>r</i>	<i>u</i>	<i>c</i>
Red-throated Loon	<i>Gavia stellata</i>				<i>r</i>

Common Name	Scientific Name	SP	SU	F	W
Grebes					
Pied-billed Grebe*	<i>Podilymbus podiceps</i>	u	r	o	u
Horned Grebe	<i>Podiceps auritus</i>	u	r	o	u
Storks					
Wood Stork	<i>Mycteria americana</i>	u	u	u	o
Gannets, Pelicans, and Allies					
Anhinga*	<i>Anhinga anhinga</i>	c	c	c	c
Magnificent Frigatebird	<i>Fregata magnificens</i>	o	o	o	
Northern Gannet	<i>Morus bassanus</i>	u	r	o	u
American White Pelican	<i>Pelecanus erythrorhynchos</i>	u	r	o	u
Brown Pelican	<i>Pelecanus occidentalis</i>	a	a	a	a
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	a	c	a	a
Brown Booby	<i>Sula leucogaster</i>		x		
Herons, Egrets, and Allies					
Great Egret*	<i>Ardea alba</i>	a	a	a	a
Great Blue Heron*	<i>Ardea herodias</i>	c	c	c	c
Great White Heron	<i>Ardea herodias</i>		x		
American Bittern	<i>Botaurus lentiginosus</i>	o	r	o	o
Cattle Egret*	<i>Bubulcus ibis</i>	c	c	c	r
Green Heron*	<i>Butorides virescens</i>	c	c	u	u
Little Blue Heron*	<i>Egretta caerulea</i>	c	c	c	c

Common Name	Scientific Name	SP	SU	F	W
Reddish Egret	<i>Egretta rufescens</i>	<i>o</i>	<i>u</i>	<i>u</i>	<i>o</i>
Snowy Egret*	<i>Egretta thula</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
Tricolored Heron*	<i>Egretta tricolor</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Least Bittern*	<i>Ixobrychus exilis</i>	<i>c</i>	<i>c</i>	<i>u</i>	<i>r</i>
Yellow-crowned Night-Heron*	<i>Nyctanassa violacea</i>	<i>u</i>	<i>u</i>	<i>r</i>	<i>r</i>
Black-crowned Night-Heron*	<i>Nycticorax nycticorax</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>c</i>
<i>Ibises and Spoonbills</i>					
White Ibis	<i>Eudocimus albus</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Roseate Spoonbill	<i>Platalea ajaja</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Glossy Ibis*	<i>Plegadis falcinellus</i>	<i>o</i>	<i>o</i>	<i>c</i>	<i>o</i>
<i>Vultures, Hawks, and Allies</i>					
Cooper's Hawk	<i>Accipiter cooperii</i>	<i>o</i>	<i>r</i>	<i>u</i>	<i>o</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>	<i>o</i>	<i>r</i>	<i>u</i>	<i>u</i>
Golden Eagle	<i>Aquila chrysaetos</i>	<i>r</i>		<i>r</i>	<i>r</i>
Red-tailed Hawk*	<i>Buteo jamaicensis</i>	<i>u</i>	<i>u</i>	<i>c</i>	<i>c</i>
Red-shouldered Hawk*	<i>Buteo lineatus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Broad-winged Hawk	<i>Buteo platypterus</i>	<i>o</i>	<i>o</i>	<i>u</i>	
Turkey Vulture	<i>Cathartes aura</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Northern Harrier	<i>Circus cyaneus</i>	<i>u</i>	<i>r</i>	<i>u</i>	<i>u</i>
Black Vulture	<i>Coragyps atratus</i>	<i>o</i>	<i>o</i>	<i>o</i>	<i>o</i>
Swallow-tailed Kite*	<i>Elanoides forficatus</i>	<i>u</i>	<i>u</i>		

Common Name	Scientific Name	SP	SU	F	W
Merlin	<i>Falco columbarius</i>	<i>o</i>		<i>o</i>	<i>o</i>
Peregrine Falcon	<i>Falco peregrinus</i>	<i>r</i>		<i>o</i>	<i>o</i>
American Kestrel*	<i>Falco sparverius</i>	<i>u</i>		<i>u</i>	<i>u</i>
Bald Eagle*	<i>Haliaeetus leucocephalus</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Mississippi Kite	<i>Ictinia mississippiensis</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Osprey*	<i>Pandion haliaetus</i>	<i>c</i>	<i>c</i>	<i>u</i>	<i>o</i>
Rails, Gallinules, Coots and Cranes					
Yellow Rail	<i>Coturnicops noveboracensis</i>	<i>r</i>			
American Coot	<i>Fulica americana</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Common Gallinule*	<i>Gallinula galeata</i>	<i>c</i>	<i>a</i>	<i>a</i>	<i>o</i>
Sandhill Crane	<i>Grus canadensis</i>	<i>r</i>		<i>o</i>	<i>o</i>
Black Rail*	<i>Laterallus jamaicensis</i>	<i>o</i>	<i>r</i>	<i>r</i>	<i>o</i>
Purple Gallinule*	<i>Porphyrio martinica</i>	<i>o</i>	<i>u</i>	<i>o</i>	<i>r</i>
Sora	<i>Porzana carolina</i>	<i>c</i>	<i>r</i>	<i>c</i>	<i>c</i>
King Rail	<i>Rallus elegans</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Virginia Rail	<i>Rallus limicola</i>	<i>u</i>		<i>u</i>	<i>u</i>
Clapper Rail*	<i>Rallus longirostris</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Shorebirds					
Spotted Sandpiper	<i>Actitis macularius</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>o</i>
Ruddy Turnstone	<i>Arenaria interpres</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>u</i>
Sanderling	<i>Calidris alba</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Dunlin	<i>Calidris alpina</i>	<i>c</i>	<i>r</i>	<i>u</i>	<i>c</i>

Common Name	Scientific Name	SP	SU	F	W
Baird's Sandpiper	<i>Calidris bairdii</i>	r			
Red Knot	<i>Calidris canutus</i>	u	u	u	u
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	o	r	o	r
Stilt Sandpiper	<i>Calidris himantopus</i>	o	o	o	r
Western Sandpiper	<i>Calidris mauri</i>	u	o	c	o
Pectoral Sandpiper	<i>Calidris melanotos</i>	o	r	o	r
Least Sandpiper	<i>Calidris minutilla</i>	c	c	c	c
Semipalmated Sandpiper	<i>Calidris pusilla</i>	u	o	u	
Piping Plover	<i>Charadrius melodus</i>	o	r	o	o
Snowy Plover*	<i>Charadrius nivosus</i>	u	u	u	u
Semipalmated Plover	<i>Charadrius semipalmatus</i>	c	u	c	c
Killdeer	<i>Charadrius vociferus</i>	u	r	u	u
Wilson's Plover*	<i>Charadrius wilsonia</i>	o	o	o	r
Wilson's Snipe	<i>Gallinago delicata</i>	o		u	o
American Oystercatcher*	<i>Haematopus palliatus</i>	u	u	u	u
Black-necked Stilt*	<i>Himantopus mexicanus</i>	o	o	o	
Short-billed Dowitcher	<i>Limnodromus griseus</i>	u	o	o	u
Marbled Godwit	<i>Limosa fedoa</i>	o	r	o	r
Hudsonian Godwit	<i>Limosa haemastica</i>	x			
Long-billed Curlew	<i>Numenius americanus</i>	r		r	r
Whimbrel	<i>Numenius phaeopus</i>	o	o	o	r
Wilson's Phalarope	<i>Phalaropus tricolor</i>	r	r	r	

Common Name	Scientific Name	SP	SU	F	W
American Golden-Plover	<i>Pluvialis dominica</i>	<i>r</i>		<i>r</i>	
Black-bellied Plover	<i>Pluvialis squatarola</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
American Avocet	<i>Recurvirostra americana</i>	<i>o</i>	<i>o</i>	<i>o</i>	<i>o</i>
American Woodcock	<i>Scolopax minor</i>	<i>o</i>	<i>r</i>	<i>o</i>	<i>o</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>o</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>o</i>
Willet*	<i>Tringa semipalmata</i>	<i>c</i>	<i>c</i>	<i>a</i>	<i>a</i>
Solitary Sandpiper	<i>Tringa solitaria</i>	<i>o</i>	<i>o</i>	<i>o</i>	
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	<i>o</i>	<i>r</i>	<i>o</i>	
Gulls, Terns, and Skimmers					
Black Tern	<i>Chlidonias niger</i>	<i>o</i>	<i>u</i>	<i>o</i>	
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	<i>u</i>		<i>o</i>	<i>u</i>
Gull-billed Tern*	<i>Gelochelidon nilotica</i>	<i>o</i>	<i>o</i>	<i>o</i>	
Caspian Tern*	<i>Hydroprogne caspia</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Herring Gull	<i>Larus argentatus</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>u</i>
Ring-billed Gull	<i>Larus delawarensis</i>	<i>c</i>	<i>o</i>	<i>c</i>	<i>c</i>
Great Black-backed Gull	<i>Larus marinus</i>	<i>r</i>			<i>r</i>
Laughing Gull	<i>Leucophaeus atricilla</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>c</i>
Sooty Tern	<i>Onychoprion fuscatus</i>		<i>r</i>	<i>r</i>	
Black Skimmer	<i>Rynchops niger</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Forster's Tern	<i>Sterna forsteri</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Common Tern	<i>Sterna hirundo</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>r</i>

Common Name	Scientific Name	SP	SU	F	W
Least Tern*	<i>Sternula antillarum</i>	c	c	u	
Royal Tern	<i>Thalasseus maximus</i>	c	c	c	u
Sandwich Tern	<i>Thalasseus sandvicensis</i>	u	c	u	r
Pigeons and Doves					
Rock Pigeon*@	<i>Columba livia</i>	r	r	r	r
Common Ground-Dove*	<i>Columbina passerina</i>	u	u	u	u
Eurasian Collared-Dove*@	<i>Streptopelia decaocto</i>	o	o	o	o
White-winged Dove	<i>Zenaida asiatica</i>	r	r	o	o
Mourning Dove*	<i>Zenaida macroura</i>	u	u	c	u
Cuckoos					
Yellow-billed Cuckoo*	<i>Coccyzus americanus</i>	u	u	u	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	r	r	r	
Groove-billed Ani	<i>Crotophaga sulcirostris</i>			r	r
Owls					
Short-eared Owl	<i>Asio flammeus</i>				x
Great Horned Owl*	<i>Bubo virginianus</i>	u	u	u	u
Eastern Screech-Owl*	<i>Megascops asio</i>	u	u	u	u
Barred Owl	<i>Strix varia</i>	r	r	r	r
Barn Owl*	<i>Tyto alba</i>	r	r	r	r
Nightjars					
Chuck-will's-widow*	<i>Caprimulgus carolinensis</i>	c	c	u	

Common Name	Scientific Name	SP	SU	F	W
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	<i>o</i>		<i>o</i>	<i>u</i>
Lesser Nighthawk	<i>Chordeiles acutipennis</i>				<i>r</i>
Common Nighthawk*	<i>Chordeiles minor</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Swifts and Hummingbirds					
Ruby-throated Hummingbird*	<i>Archilochus colubris</i>	<i>u</i>	<i>o</i>	<i>u</i>	
Chimney Swift*	<i>Chaetura pelagica</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Kingfishers					
Belted Kingfisher	<i>Megaceryle alcyon</i>	<i>c</i>	<i>u</i>	<i>c</i>	<i>c</i>
Woodpeckers					
Northern Flicker	<i>Colaptes auratus</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>u</i>
Pileated Woodpecker*	<i>Dryocopus pileatus</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Red-bellied Woodpecker*	<i>Melanerpes carolinus</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Red-headed Woodpecker*	<i>Melanerpes erythrocephalus</i>	<i>o</i>	<i>o</i>	<i>o</i>	<i>o</i>
Red-cockaded Woodpecker	<i>Picoides borealis</i>	<i>+</i>	<i>+</i>	<i>+</i>	<i>+</i>
Downy Woodpecker*	<i>Picoides pubescens</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Hairy Woodpecker	<i>Picoides villosus</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	<i>u</i>		<i>u</i>	<i>u</i>
Flycatchers					
Eastern Wood-Pewee	<i>Contopus virens</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Willow Flycatcher	<i>Empidonax traillii</i>	<i>r</i>			
Acadian Flycatcher	<i>Empidonax virescens</i>	<i>o</i>	<i>o</i>	<i>o</i>	

Common Name	Scientific Name	SP	SU	F	W
Great Crested Flycatcher*	<i>Myiarchus crinitus</i>	c	c	o	
Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>				r
Eastern Phoebe	<i>Sayornis phoebe</i>	u		c	c
Gray Kingbird	<i>Tyrannus dominicensis</i>	r	r	r	
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>			r	
Eastern Kingbird*	<i>Tyrannus tyrannus</i>	c	c	c	
Western Kingbird	<i>Tyrannus verticalis</i>	r	r	r	r
Shrikes					
Loggerhead Shrike	<i>Lanius ludovicianus</i>	r	r	r	r
Vireos					
Black-whiskered Vireo	<i>Vireo altiloquus</i>	r			
Yellow-throated Vireo*	<i>Vireo flavifrons</i>	u	u	u	
Warbling Vireo	<i>Vireo gilvus</i>	r			
White-eyed Vireo*	<i>Vireo griseus</i>	c	c	c	u
Red-eyed Vireo*	<i>Vireo olivaceus</i>	c	c	c	
Philadelphia Vireo	<i>Vireo philadelphicus</i>	r			
Blue-headed Vireo	<i>Vireo solitarius</i>	u		u	u
Jays and Crows					
American Crow	<i>Corvus brachyrhynchos</i>	o	o	u	u
Fish Crow*	<i>Corvus ossifragus</i>	c	c	c	u
Blue Jay*	<i>Cyanocitta cristata</i>	u	u	u	u

Common Name	Scientific Name	SP	SU	F	W
Martins and Swallows					
Barn Swallow*	<i>Hirundo rustica</i>	c	c	c	r
Cave Swallow	<i>Petrochelidon fulva</i>	r			
Cliff Swallow*	<i>Petrochelidon pyrrhonota</i>	r	r	r	
Purple Martin*	<i>Progne subis</i>	u	u	o	o
Bank Swallow	<i>Riparia riparia</i>	o	o	o	
Northern Rough-winged Swallow*	<i>Stelgidopteryx serripennis</i>	o	o	o	r
Tree Swallow	<i>Tachycineta bicolor</i>	a	u	a	a
Chickadees and Titmice					
Tufted Titmouse*	<i>Baeolophus bicolor</i>	u	u	u	u
Carolina Chickadee*	<i>Poecile carolinensis</i>	c	c	c	c
Nuthatches					
Brown-headed Nuthatch*	<i>Sitta pusilla</i>	u	u	u	u
Creepers					
Brown Creeper	<i>Certhia americana</i>			r	
Wrens					
Marsh Wren*	<i>Cistothorus palustris</i>	u	u	c	c
Sedge Wren	<i>Cistothorus platensis</i>	u		u	u
Carolina Wren*	<i>Thryothorus ludovicianus</i>	c	c	c	c
House Wren	<i>Troglodytes aedon</i>	o		u	u

Common Name	Scientific Name	SP	SU	F	W
Gnatcatchers and Kinglets					
Blue-gray Gnatcatcher*	<i>Polioptila caerulea</i>	c	c	c	u
Ruby-crowned Kinglet	<i>Regulus calendula</i>	c		c	c
Golden-crowned Kinglet	<i>Regulus satrapa</i>	r		r	r
Bluebirds, Thrushes, and Robins					
Veery	<i>Catharus fuscescens</i>	u		u	
Hermit Thrush	<i>Catharus guttatus</i>	o		u	u
Gray-cheeked Thrush	<i>Catharus minimus</i>	o		u	
Swainson's Thrush	<i>Catharus ustulatus</i>	o		u	
Wood Thrush	<i>Hylocichla mustelina</i>	u	r	o	
Eastern Bluebird*	<i>Sialia sialis</i>	u	r	u	u
American Robin	<i>Turdus migratorius</i>	a		c	a
Mimic Thrushes					
Gray Catbird	<i>Dumetella carolinensis</i>	c	r	a	c
Northern Mockingbird*	<i>Mimus polyglottos</i>	c	c	c	c
Brown Thrasher*	<i>Toxostoma rufum</i>	u	u	c	u
Starlings					
European Starling* @	<i>Sturnus vulgaris</i>	o	o	o	o
Pipits					
American Pipit	<i>Anthus rubescens</i>			o	r

Common Name	Scientific Name	SP	SU	F	W
Waxwings					
Cedar Waxwing	<i>Bombycilla cedrorum</i>	u		u	u
Warblers					
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	o		o	
Bay-breasted Warbler	<i>Dendroica castanea</i>	r		u	
Yellow-rumped Warbler	<i>Dendroica coronata</i>	a		a	a
Prairie Warbler	<i>Dendroica discolor</i>	u	o	u	r
Yellow-throated Warbler*	<i>Dendroica dominica</i>	c	c	u	o
Blackburnian Warbler	<i>Dendroica fusca</i>	r		o	
Magnolia Warbler	<i>Dendroica magnolia</i>	r	r	u	
Palm Warbler	<i>Dendroica palmarum</i>	u		u	u
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	r		o	
Yellow Warbler	<i>Dendroica petechia</i>	o	o	o	
Pine Warbler*	<i>Dendroica pinus</i>	a	a	a	a
Blackpoll Warbler	<i>Dendroica striata</i>	u		o	
Cape May Warbler	<i>Dendroica tigrina</i>	u			
Black-throated Green Warbler	<i>Dendroica virens</i>	o		o	
Common Yellowthroat*	<i>Geothlypis trichas</i>	c	c	c	c
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	o	r	u	
Yellow-breasted Chat*	<i>Icteria virens</i>	u	u	r	
Black-and-white Warbler	<i>Mniotilta varia</i>	u	o	u	o

Common Name	Scientific Name	SP	SU	F	W
Orange-crowned Warbler	<i>Oreothlypis celata</i>	<i>u</i>		<i>u</i>	<i>u</i>
Tennessee Warbler	<i>Oreothlypis peregrina</i>	<i>r</i>		<i>u</i>	
Louisiana Waterthrush	<i>Parkesia motacilla</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Northern Waterthrush	<i>Parkesia noveboracensis</i>	<i>u</i>	<i>r</i>	<i>u</i>	
Northern Parula*	<i>Parula americana</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>o</i>
Prothonotary Warbler*	<i>Protonotaria citrea</i>	<i>u</i>	<i>u</i>	<i>o</i>	
Ovenbird	<i>Seiurus aurocapilla</i>	<i>o</i>		<i>u</i>	<i>r</i>
American Redstart	<i>Setophaga ruticilla</i>	<i>o</i>	<i>r</i>	<i>u</i>	
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	<i>r</i>	<i>r</i>	<i>r</i>	
Hooded Warbler*	<i>Wilsonia citrina</i>	<i>u</i>	<i>u</i>	<i>u</i>	
Wilson's Warbler	<i>Wilsonia pusilla</i>			<i>r</i>	<i>r</i>
Sparrows					
Saltmarsh Sparrow	<i>Ammodramus caudacutus</i>				<i>r</i>
Seaside Sparrow*	<i>Ammodramus maritimus</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>u</i>
Nelson's Sparrow	<i>Ammodramus nelsoni</i>	<i>u</i>		<i>u</i>	<i>u</i>
Lark Sparrow	<i>Chondestes grammacus</i>	<i>r</i>		<i>r</i>	<i>r</i>
Dark-eyed Junco	<i>Junco hyemalis</i>	<i>r</i>		<i>o</i>	<i>o</i>
Swamp Sparrow	<i>Melospiza georgiana</i>	<i>c</i>		<i>c</i>	<i>c</i>
Lincoln's Sparrow	<i>Melospiza lincolni</i>				<i>r</i>
Song Sparrow	<i>Melospiza melodia</i>	<i>u</i>		<i>u</i>	<i>u</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>	<i>u</i>		<i>u</i>	<i>u</i>
Fox Sparrow	<i>Passerella iliaca</i>				<i>r</i>

Common Name	Scientific Name	SP	SU	F	W
Bachman's Sparrow	<i>Peucaea aestivalis</i>	u	u	o	o
Eastern Towhee*	<i>Pipilo erythrophthalmus</i>	a	a	a	a
Vesper Sparrow	<i>Pooecetes gramineus</i>	r	r		r
Chipping Sparrow	<i>Spizella passerina</i>	u		u	u
Field Sparrow	<i>Spizella pusilla</i>	u		u	u
White-throated Sparrow	<i>Zonotrichia albicollis</i>	u		u	u
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	o		o	o
Tanagers					
Scarlet Tanager	<i>Piranga olivacea</i>	o		o	
Summer Tanager*	<i>Piranga rubra</i>	c	c	c	
Cardinals and Grosbeaks					
Northern Cardinal*	<i>Cardinalis cardinalis</i>	c	c	c	c
Blue Grosbeak	<i>Passerina caerulea</i>	c	u	u	
Painted Bunting	<i>Passerina ciris</i>	r		r	
Indigo Bunting	<i>Passerina cyanea</i>	c	o	u	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	u		u	
Blackbirds, Grackles, Cowbirds, and Orioles					
Red-winged Blackbird*	<i>Agelaius phoeniceus</i>	a	a	a	a
Bobolink	<i>Dolichonyx oryzivorus</i>	u		o	
Rusty Blackbird	<i>Euphagus carolinus</i>				r
Baltimore Oriole	<i>Icterus galbula</i>	r		u	
Orchard Oriole*	<i>Icterus spurius</i>	c	u	o	

Common Name	Scientific Name	SP	SU	F	W
Brown-headed Cowbird*	<i>Molothrus ater</i>	<i>c</i>	<i>u</i>	<i>u</i>	<i>u</i>
Shiny Cowbird	<i>Molothrus bonariensis</i>	<i>r</i>	<i>r</i>		
Boat-tailed Grackle*	<i>Quiscalus major</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
Common Grackle*	<i>Quiscalus quiscula</i>	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Eastern Meadowlark	<i>Sturnella magna</i>	<i>u</i>	<i>o</i>	<i>u</i>	<i>u</i>
Finches					
Pine Siskin	<i>Spinus pinus</i>	<i>r</i>		<i>r</i>	<i>r</i>
American Goldfinch	<i>Spinus tristis</i>	<i>o</i>		<i>o</i>	<i>o</i>
Gallinaceous birds (Quails, Turkeys, and Allies)					
Northern Bobwhite*	<i>Colinus virginianus</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Wild Turkey*	<i>Meleagris gallopavo</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>

ST. VINCENT NWR - FISH, AMPHIBIAN, REPTILE, AND MAMMAL LIST

The following list includes those species known to have occurred on the refuge through documented sightings.

+ No longer occur on refuge

@ Exotic species not native to the area

Common Name	Scientific Name
Fishes	
Yellow Bullhead	<i>Ameiurus natalis</i>
Brown Bullhead	<i>Ameiurus nebulosus</i>
Bowfin	<i>Amia calva</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Hardhead Catfish	<i>Arius felis</i>
Atlantic Menhaden	<i>Brevoortia tyrannus</i>
Spotted Seatrout	<i>Cynoscion nebulosus</i>
Silver Seatrout	<i>Cynoscion nothus</i>
Sheepshead Minnow	<i>Cyprinodon variegates</i>
Common Carp @	<i>Cyprinus carpio</i>
Fat Sleeper	<i>Dormitator maculatus</i>
Gizzard Shad	<i>Dorosoma cepedianum</i>
Threadfin Shad	<i>Dorosoma petenense</i>
Everglades Pygmy Sunfish	<i>Elassoma evergladei</i>
Ladyfish	<i>Elops saurus</i>
Lake Chubsucker	<i>Erimyzon sucetta</i>
Golden Topminnow	<i>Fundulus chrysotus</i>
Banded Topminnow	<i>Fundulus cingulatus</i>
Gulf Killifish	<i>Fundulus grandis</i>
Eastern Mosquitofish	<i>Gambusia holbrooki</i>
Naked Goby	<i>Gibiosoma bosc</i>
Least Killifish	<i>Heterandria formosa</i>
Pinfish	<i>Lagodon rhomboides</i>
Spotted Gar	<i>Lepisosteus oculatus</i>
Warmouth	<i>Lepomis gulosus</i>
Bluegill -Hand-painted Bream color variant	<i>Lepomis macrochirus</i>
Redear Sunfish	<i>Lepomis microlophus</i>

Common Name	Scientific Name
Pygmy Killifish	<i>Leptolucania ommata</i>
Rainwater Killifish	<i>Lucania parva</i>
Tarpon	<i>Megalops atlanticus</i>
Tidewater Silversides	<i>Menidia beryllina</i>
Atlantic Croaker	<i>Micripogonias undulates</i>
Clown Goby	<i>Microgobius gulosus</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Striped Mullet	<i>Mugil cephalus</i>
Golden Shiner	<i>Notemigonus crysoleucas</i>
Gulf Flounder	<i>Paralichthys albigutta</i>
Sailfin Molly	<i>Poecilia latipinna</i>
Silversides	<i>Poecilia latipinna</i>
Red Drum	<i>Sciaenops ocellatus</i>
Amphibians and Reptiles	
Salamanders	
Two-toed Amphiuma	<i>Amphiuma means</i>
Frogs & Toads	
Southern Cricket Frog	<i>Acris gryllus</i>
Oak Toad	<i>Anaxyrus quercicus</i>
Southern Toad	<i>Anaxyrus terrestris</i>
Eastern Narrowmouth Toad	<i>Gastrophryne carolinensis</i>
Green Treefrog	<i>Hyla cinerea</i>
Pine Woods Treefrog	<i>Hyla femoralis</i>
Squirrel Treefrog	<i>Hyla squirella</i>
Pig Frog	<i>Lithobates grylio</i>
Southern Leopard Frog	<i>Lithobates sphenoccephalus</i>
Little Grass Frog	<i>Pseudacris ocularis</i>
Non-Marine Turtles	
Florida Softshell	<i>Apalone ferox</i>
Common Snapping Turtle	<i>Chelydra serpentine</i>
Chicken Turtle	<i>Deirochelys reticularia</i>
Gopher Tortoise	<i>Gopherus polyphemus</i>

Common Name	Scientific Name
Eastern Mud Turtle	<i>Kinosternon subrubrum</i>
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>
Diamondback Terrapin	<i>Malaclemys terrapin</i>
Florida Cooter	<i>Pseudemys floridana</i>
Florida Redbelly Turtle	<i>Pseudemys nelsoni</i>
Eastern Box Turtle	<i>Terrapene carolina</i>
Marine Turtles	
Loggerhead	<i>Caretta caretta</i>
Green Turtle	<i>Chelonia mydas</i>
Leatherback	<i>Dermochelys coriacea</i>
Kemp's (Atlantic) Ridley	<i>Lepidochelys kempii</i>
Crocodilians	
American Alligator	<i>Alligator mississippiensis</i>
Lizards	
Green Anole	<i>Anolis carolinensis</i>
Six-lined Racerunner	<i>Aspidoscelis sexlineata</i>
Eastern Glass Lizard	<i>Ophisaurus ventralis</i>
Broadhead Skink	<i>Plestiodon laticeps</i>
Ground Skink	<i>Scincella lateralis</i>
Snakes	
Cottonmouth	<i>Agkistrodon piscivorus</i>
Scarlet Snake	<i>Cemophora coccinea</i>
Eastern (Black) Racer	<i>Coluber constrictor</i>
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>
Eastern Indigo Snake +	<i>Drymarchon corais couperi</i>
Mud Snake	<i>Farancia abacura</i>
Common Kingsnake	<i>Lampropeltis getula</i>
Scarlet Kingsnake	<i>Lampropeltis triangulum</i>
Coachwhip	<i>Masticophis flagellum</i>
Gulf Salt Marsh Snake	<i>Nerodia clarkii</i>
Southern Water Snake	<i>Nerodia fasciata</i>
Florida Green Water Snake	<i>Nerodia floridana</i>

Common Name	Scientific Name
Rough Green Snake	<i>Opheodrys aestivus</i>
Eastern Corn Snake	<i>Pantherophis guttatus</i>
Glossy Crayfish Snake	<i>Regina rigida</i>
Midland Rat Snake	<i>Scotophis spiloides</i>
Black Swamp Snake	<i>Seminatrix pygaea</i>
Pigmy Rattlesnake	<i>Sistrurus miliarius</i>
Brown Snake	<i>Storeria dekayi</i>
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>
Common Garter Snake	<i>Thamnophis sirtalis</i>
Rough Earth Snake	<i>Virginia striatula</i>
Mammals	
Coyote @	<i>Canis latrans</i>
Red Wolf	<i>Canis rufus</i>
Sambar Deer @	<i>Cervus unicolor</i>
Nine-banded Armadillo	<i>Dasybus novemcinctus</i>
Virginia Opossum	<i>Didelphis virginiana</i>
Domestic Cat @	<i>Felis catus</i>
Northern Yellow Bat	<i>Lasiurus intermedius</i>
Seminole Bat	<i>Lasiurus seminolus</i>
River Otter	<i>Lutra canadensis</i>
Bobcat	<i>Lynx rufus</i>
Evening Bat	<i>Nycticeius humeralis</i>
White-tailed Deer	<i>Odocoileus virginianus</i>
Marsh Rice Rat	<i>Oryzomys palustris</i>
Cotton Mouse	<i>Peromyscus gossypinus</i>
Eastern Pipistrelle	<i>Pipistrellus subflavus</i>
Raccoon	<i>Procyon lotor</i>
Eastern Mole	<i>Scalopus aquaticus</i>
Gray Squirrel	<i>Sciurus carolinensis</i>
Hispid Cotton Rat	<i>Sigmodon hispidus</i>
Rough-toothed Dolphin	<i>Steno bredanensis</i>
Feral Hog @	<i>Sus scrofa*</i>

Common Name	Scientific Name
Marsh Rabbit	<i>Sylvilagus palustris</i>
Brazilian Free-tailed Bat	<i>Tadarida brasiliensis</i>
Florida Manatee	<i>Trichechus manatus</i>
Atlantic Bottle-nosed Dolphin	<i>Tursiops truncatus</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Black Bear	<i>Ursus americanus</i>
Red Fox	<i>Vulpes vulpes</i>

ST. VINCENT NWR – SENSITIVE SPECIES LIST

The following table contains a list of federal and state threatened and endangered species as well as selected Florida Natural Areas Inventory (FNAI)-tracked vertebrate species. The conservation Rank and Legal Status Explanation are adapted from Florida Natural Areas Inventory, 2009 (<http://www.fnai.org/trackinglist.cfm>). The list also included global and state rankings system.

FNAI GLOBAL RANK DEFINITIONS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range).

G5 = Demonstrably secure globally.

GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).

GX = Believed to be extinct throughout range.

GXC = Extirpated from the wild but still known from captivity or cultivation.

G#? = Tentative rank (e.g., G2).

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).

G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).

G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).

G#T#Q = Same as above, but validity as subspecies or variety is questioned.

GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).

GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

GNR = Element not yet ranked (temporary).

GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE RANK DEFINITIONS

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.
SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
SX = Believed to be extirpated throughout Florida.
SU = Unrankable; due to a lack of information no rank or range can be assigned.
SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3.

LE Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
LT,PDL Species currently listed threatened but has been proposed for delisting.
LT,PE Species currently listed Threatened but has been proposed for listing as Endangered.
SAT Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
PE Proposed for listing as Endangered species.
PT Proposed for listing as Threatened species.
C Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN Non-essential experimental population.
SC Not currently listed, but considered a "species of concern" to USFWS.
N Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

LE Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
PS Proposed for listing as Species of Special Concern.
N Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001.

LE Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
LT Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
PE Proposed for listing as Endangered.
PT Proposed for listing as Threatened.
N Not currently listed, nor currently being considered for listing.

Common Name	Scientific Name	Global Rank	FNAI State Rank	Federal Status	State Status
Fish					
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	G3T2	S2	LT	LS
Reptiles					
American Alligator	<i>Alligator mississippiensis</i>	G5	S4	SAT	LS
Loggerhead Sea Turtle	<i>Caretta caretta</i>	G3	S3	LT	LT
Green Sea Turtle	<i>Chelonia mydas</i>	G3	S2	LE	LE
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>	G4	S3	N	N
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	G2	S2	LE	LE
Eastern Indigo Snake	<i>Drymarchon couperi</i>	G3	S3	LT	LT
Gopher Tortoise	<i>Gopherus polyphemus</i>	G3	S3	C	LT
Common Kingsnake	<i>Lampropeltis getula</i>	G5	S2S3	N	N
Kemp's (Atlantic) Ridley	<i>Lepidochelys kempii</i>	G1	G1	LE	LE
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	G3G4	S3	N	LS
Ornate Diamondback Terrapin	<i>Malaclemys terrapin macrospilota</i>	G4	S4	N	N
Gulf Salt Marsh Snake	<i>Nerodia clarkii</i>	G4T4	S3?	N	N
Mammals					
Red Wolf	<i>Canis rufus</i>	G1Q		LE	
Florida Manatee	<i>Trichechus manatus</i>	G2	S2	LE	LE
Birds					
Cooper's Hawk	<i>Accipiter cooperii</i>	G5	S3	N	N
Seaside Sparrow	<i>Ammodramus maritimus</i>	G4T3Q	S3	N	LS
Great Egret	<i>Ardea alba</i>	G5	S4	N	N

Common Name	Scientific Name	Global Rank	FNAI State Rank	Federal Status	State Status
Piping Plover	<i>Charadrius melodus</i>	G3	S2	LT/LE	LT
Snowy Plover	<i>Charadrius nivosus</i>	G4	S1	N	LT
Marsh Wren	<i>Cistothorus palustris marianae</i>	G5T3	S3	N	LS
Little Blue Heron	<i>Egretta caerulea</i>	G5	S4	N	LS
Reddish Egret	<i>Egretta rufescens</i>	G4	S2	N	LS
Snowy Egret	<i>Egretta thula</i>	G5	S3	N	LS
Tricolored Heron	<i>Egretta tricolor</i>	G5	S4	N	LS
Swallow-tailed Kite	<i>Elanoides forficatus</i>	G5	S2	N	N
White Ibis	<i>Eudocimus albus</i>	G5	S4	N	LS
Merlin	<i>Falco columbarius</i>	G5	S2	N	N
Peregrine Falcon	<i>Falco peregrinus</i>	G4	S2	N	N
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	G5T4	S3	N	LT
American Oystercatcher	<i>Haematopus palliatus</i>	G5	S2	N	LS
Bald Eagle	<i>Haliaeetus leucocephalus</i>	G5	S3	N	N
Caspian Tern	<i>Hydroprogne caspia</i>	G5	S2	N	N
Least Bittern	<i>Ixobrychus exilis</i>	G5	S4	N	N
Black Rail	<i>Laterallus jamaicensis</i>	G4	S2	N	N
Wood Stork	<i>Mycteria americana</i>	G4	S2	LE	LE
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	G5	S3	N	N
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	G5	S3	N	N

Common Name	Scientific Name	Global Rank	FNAI State Rank	Federal Status	State Status
Osprey	<i>Pandion haliaetus</i>	G5	S3S4	N	LS*
Brown Pelican	<i>Pelecanus occidentalis</i>	G4	S3	N	LS
Bachman's Sparrow	<i>Peucaea aestivalis</i>	G3	S3	N	N
Hairy Woodpecker	<i>Picoides villosus</i>	G5	S3	N	N
Roseate Spoonbill	<i>Platalea ajaja</i>	G5	S2	N	LS
Glossy Ibis	<i>Plegadis falcinellus</i>	G5	S3	N	N
Black Skimmer	<i>Rynchops niger</i>	G5	S3	N	LS
Least Tern	<i>Sternula antillarum</i>	G4	S3	N	LT
Royal Tern	<i>Thalasseus maximus</i>	G5	S3	N	N
Sandwich Tern	<i>Thalasseus sandvicensis</i>	G5	S2	N	N
Plants					
Corkwood	<i>Leitneria floridana</i>	G3	S3	N	LT
West's flax	<i>Linum westii</i>	G2	S2	N	LE
Gulfcoast lupine	<i>Lupinus westianus</i> var. <i>westianus</i>	G3	S3	N	LT
Florida beargrass	<i>Nolina atopocarpa</i>	G3	S3	N	LT
Drummond's yellow-eyed grass	<i>Xyris drummondii</i>	G3	S3		NL

ST. VINCENT NWR – PLANT LIST

Common name	Genus	Species	Variety/Subsp
Sweet acacia	<i>Acacia</i>	<i>farnesiana</i>	
Slender threeseed mercury	<i>Acalypha</i>	<i>gracilens</i>	
Diamond threeseed mercury	<i>Acalypha</i>	<i>rhomboidea</i>	
Red maple	<i>Acer</i>	<i>rubrum</i>	
Sticky jointvetch	<i>Aeschynomene</i>	<i>viscidula</i>	
Scaleleaf false foxglove	<i>Agalinis</i>	<i>aphylla</i>	
Pineland false foxglove	<i>Agalinis</i>	<i>divaricata</i>	
Beach false foxglove	<i>Agalinis</i>	<i>fasciculata</i>	
Seminole false foxglove	<i>Agalinis</i>	<i>filifolia</i>	
Saltmarsh false foxglove	<i>Agalinis</i>	<i>maritima</i>	
Threadleaf false foxglove	<i>Agalinis</i>	<i>setacea</i>	
Alligatorweed ⁺	<i>Alternanthera</i>	<i>philoxeroides</i>	
Southern amaranth	<i>Amaranthus</i>	<i>australis</i>	
Tidalmarsh Amaranth	<i>Amaranthus</i>	<i>cannabinus</i>	
Roughfruit amaranth	<i>Amaranthus</i>	<i>tuberculatus</i>	
Common ragweed	<i>Ambrosia</i>	<i>artemisiifolia</i>	
Scarlet ammannia; Valley redstem	<i>Ammannia</i>	<i>coccinea</i>	
Toothcup; Pink redstem	<i>Ammannia</i>	<i>latifolia</i>	
Bastard indigobush; False indigobush	<i>Amorpha</i>	<i>fruticosa</i>	
Lusterspike indigobush	<i>Amorpha</i>	<i>herbacea</i>	var. <i>herbacea</i>
Peppervine	<i>Ampelopsis</i>	<i>arborea</i>	
Chaffweed	<i>Anagallis</i>	<i>minima</i>	
Bushy beardgrass	<i>Andropogon</i>	<i>glomeratus</i>	var. <i>glomeratus</i>
Purple bluestem	<i>Andropogon</i>	<i>glomeratus</i>	var. <i>glaucopsis</i>
Bushy beardgrass	<i>Andropogon</i>	<i>glomeratus</i>	var. <i>pumilus</i>
Beardgrass	<i>Andropogon</i>	<i>gyrans</i>	var. <i>gyrans</i>
Broomsedge	<i>Andropogon</i>	<i>virginicus</i>	var. <i>virginicus</i>
Chalky bluestem	<i>Andropogon</i>	<i>virginicus</i>	var. <i>glaucus</i>
Indianhemp	<i>Apocynum</i>	<i>cannabinum</i>	

Common name	Genus	Species	Variety/Subspp
Spreading sandwort	<i>Arenaria</i>	<i>lanuginosa</i>	
Big threeawn; Piedmont threeawn	<i>Aristida</i>	<i>condensata</i>	
Corkscrew threeawn	<i>Aristida</i>	<i>gyrans</i>	
Mohr's threeawn	<i>Aristida</i>	<i>mohrii</i>	
Tall threeawn	<i>Aristida</i>	<i>patula</i>	
Arrowfeather	<i>Aristida</i>	<i>purpurascens</i>	var. <i>purpurascens</i>
Bottlebrush threeawn	<i>Aristida</i>	<i>spiciformis</i>	
Wiregrass	<i>Aristida</i>	<i>stricta</i>	Var. <i>beurichiana</i>
Fewflower milkweed	<i>Asclepias</i>	<i>lanceolata</i>	
Ebony spleenwort	<i>Asplenium</i>	<i>platyneuron</i>	
Savannah aster	<i>Aster</i>	<i>chapmanii</i>	
Rice button aster	<i>Aster</i>	<i>dumosus</i>	
Annual saltmarsh aster	<i>Aster</i>	<i>subulatus</i>	
Perennial saltmarsh aster	<i>Aster</i>	<i>tenuifolius</i>	
Whitetop aster; Dixie aster	<i>Aster</i>	<i>tortifolius</i>	
Crested saltbush	<i>Atriplex</i>	<i>pentandra</i>	
Fernleaf yellow false foxglove	<i>Aureolaria</i>	<i>pedicularia</i>	
Common carpetgrass	<i>Axonopus</i>	<i>fissifolius</i>	
Saltwater falsewillow	<i>Baccharis</i>	<i>angustifolia</i>	
Groundsel tree, Sea myrtle	<i>Baccharis</i>	<i>halimifolia</i>	
Herb-of-Grace	<i>Bacopa</i>	<i>monnieri</i>	
White screwstem	<i>Bartonia</i>	<i>verna</i>	
Saltwort; Turtleweed	<i>Batis</i>	<i>maritima</i>	
Nodding beggartick	<i>Bidens</i>	<i>cernua</i>	
Burrmarigold; Smooth beggarticks	<i>Bidens</i>	<i>laevis</i>	
False nettle, Bog hemp	<i>Boehmeria</i>	<i>cylindrica</i>	
Bushy seaside oxeye	<i>Borrichia</i>	<i>frutescens</i>	
American bluehearts	<i>Buchnera</i>	<i>americana</i>	
Densetuft hairsedge	<i>Bulbostylis</i>	<i>capillaris</i>	
Capillary hairsedge	<i>Bulbostylis</i>	<i>ciliatifolia</i>	
American searocket	<i>Cakile</i>	<i>edentula</i>	subsp. <i>harperi</i>

Common name	Genus	Species	Variety/Subsp
Coastal searocket	<i>Cakile</i>	<i>lanceolata</i>	
American beautyberry	<i>Callicarpa</i>	<i>americana</i>	
Larger Waterstarwort	<i>Callitriche</i>	<i>heterophylla</i>	
Tuberous grasspink	<i>Calopogon</i>	<i>tuberosus</i>	
Trumpet creeper	<i>Campsis</i>	<i>radicans</i>	
Baybean; Seaside jackbean	<i>Canavalia</i>	<i>rosea</i>	
Bandana-of-the-Everglades	<i>Canna</i>	<i>flaccida</i>	
Pennsylvania bittercress	<i>Cardamine</i>	<i>pennsylvanica</i>	
Shoreline sedge	<i>Carex</i>	<i>hyalinolepis</i>	
Long's sedge	<i>Carex</i>	<i>longii</i>	
Shallow sedge	<i>Carex</i>	<i>lurida</i>	
Warty sedge	<i>Carex</i>	<i>verrucosa</i>	
Vanillaleaf	<i>Carphephorus</i>	<i>odoratissimus</i>	
Water hickory	<i>Carya</i>	<i>aquatica</i>	
Pignut hickory	<i>Carya</i>	<i>glabra</i>	
Pecan ⁺	<i>Carya</i>	<i>illinoensis</i>	
Shagbark hickory	<i>Carya</i>	<i>ovata</i>	
Sugarberry, Hackberry	<i>Celtis</i>	<i>laevigata</i>	
Coastal sandbur	<i>Cenchrus</i>	<i>incertus</i>	
Sanddune sandbur	<i>Cenchrus</i>	<i>tribuloides</i>	
Spadeleaf	<i>Centella</i>	<i>asiatica</i>	
Spurred butterfly pea	<i>Centrosema</i>	<i>virginianum</i>	
Common buttonbush	<i>Cephalanthus</i>	<i>occidentalis</i>	
Florida rosemary; Sand heath	<i>Ceratiola</i>	<i>ericoides</i>	
Coontail	<i>Ceratophyllum</i>	<i>demersum</i>	
Prickly hornwort	<i>Ceratophyllum</i>	<i>muricatum</i>	
Spreading chervil	<i>Chaerophyllum</i>	<i>procumbens</i>	
Hairyfruit chervil	<i>Chaerophyllum</i>	<i>tainturieri</i>	
Partridgepea	<i>Chamaecrista</i>	<i>fasciculata</i>	
Dixie sandmat	<i>Chamaesyce</i>	<i>bombensis</i>	
Hyssopleaf sandmat	<i>Chamaesyce</i>	<i>hyssopifolia</i>	

Common name	Genus	Species	Variety/Subspp
Spotted sandmat	<i>Chamaesyce</i>	<i>maculata</i>	
Eyebane	<i>Chamaesyce</i>	<i>nutans</i>	
Longleaf chasmanthium	<i>Chasmanthium</i>	<i>laxum</i>	var. <i>sessiliflorum</i>
Mexican tea [†]	<i>Chenopodium</i>	<i>ambrosioides</i>	
Bush goldenrod; Woody goldenrod	<i>Chrysoma</i>	<i>pauciflosculosa</i>	
Cottony goldenaster	<i>Chrysopsis</i>	<i>gossypina</i>	subsp. <i>gossypina</i>
Ozarkgrass	<i>Cinna</i>	<i>arkansana</i>	
Yellow thistle	<i>Cirsium</i>	<i>horridulum</i>	
Nuttall's thistle	<i>Cirsium</i>	<i>nuttallii</i>	
Sorrelvine; Marinevine	<i>Cissus</i>	<i>trifoliata</i>	
Jamaica swamp sawgrass	<i>Cladium</i>	<i>jamaicense</i>	
Black titi; Buckwheat tree	<i>Cliftonia</i>	<i>monophylla</i>	
Atlantic pigeonwings	<i>Clitoria</i>	<i>mariana</i>	
Tread-softly; Finger-rot	<i>Cnidoscolus</i>	<i>stimulosus</i>	
Carolina coralbead	<i>Cocculus</i>	<i>carolinus</i>	
Whitemouth dayflower	<i>Commelina</i>	<i>erecta</i>	
False rosemary	<i>Conradina</i>	<i>canescens</i>	
Dwarf Canadian horseweed	<i>Conyza</i>	<i>canadensis</i>	var. <i>pusilla</i>
Coastalplain tickseed	<i>Coreopsis</i>	<i>gladiata</i>	
Lanceleaf tickseed	<i>Coreopsis</i>	<i>lanceolata</i>	
Texas tickseed	<i>Coreopsis</i>	<i>linifolia</i>	
Rabbitbells	<i>Crotalaria</i>	<i>rotundifolia</i>	
Vente conmigo	<i>Croton</i>	<i>glandulosus</i>	
Gulf croton; Beach tea	<i>Croton</i>	<i>punctatus</i>	
Compact dodder	<i>Cuscuta</i>	<i>compacta</i>	
Gulf coast swallowwort	<i>Cynanchum</i>	<i>angustifolium</i>	
Leafless swallowwort	<i>Cynanchum</i>	<i>scoparium</i>	
Bermuda grass [†]	<i>Cynodon</i>	<i>dactylon</i>	
Poorland flatsedge	<i>Cyperus</i>	<i>compressus</i>	
Baldwin's flatsedge	<i>Cyperus</i>	<i>croceus</i>	
Swamp flatsedge	<i>Cyperus</i>	<i>distinctus</i>	

Common name	Genus	Species	Variety/Subsp
Yellow nutgrass, Chufa flatsedge ⁺	<i>Cyperus</i>	<i>esculentus</i>	
Haspan flatsedge	<i>Cyperus</i>	<i>haspan</i>	
Epiphytic flatsedge	<i>Cyperus</i>	<i>lanceolatus</i>	
Fragrant flatsedge	<i>Cyperus</i>	<i>odoratus</i>	
Manyspike flatsedge	<i>Cyperus</i>	<i>polystachyos</i>	
Pinebarren flatsedge	<i>Cyperus</i>	<i>retorsus</i>	
Tropical flatsedge	<i>Cyperus</i>	<i>surinamensis</i>	
Fourangle flatsedge	<i>Cyperus</i>	<i>tetragonus</i>	
Green flatsedge	<i>Cyperus</i>	<i>virens</i>	
Titi	<i>Cyrilla</i>	<i>racemiflora</i>	
American wild carrot	<i>Daucus</i>	<i>pusillus</i>	
Western tansymustard	<i>Descurainia</i>	<i>pinnata</i>	
Panicledleaf ticktrefoil	<i>Desmodium</i>	<i>paniculatum</i>	
Pinebarren ticktrefoil	<i>Desmodium</i>	<i>strictum</i>	
Velvetleaf ticktrefoil	<i>Desmodium</i>	<i>viridiflorum</i>	
Needleleaf witchgrass	<i>Dichantherium</i>	<i>aciculare</i>	
Variable witchgrass	<i>Dichantherium</i>	<i>commutatum</i>	
Erectleaf witchgrass	<i>Dichantherium</i>	<i>erectifolium</i>	
Heller's witchgrass	<i>Dichantherium</i>	<i>oligosanthes</i>	
Carolina ponysfoot	<i>Dichondra</i>	<i>caroliniensis</i>	
Southern crabgrass	<i>Digitaria</i>	<i>ciliaris</i>	
Slender crabgrass; Shaggy crabgrass	<i>Digitaria</i>	<i>filiformis</i>	
Blanket crabgrass; Dwarf crabgrass	<i>Digitaria</i>	<i>serotina</i>	
Poor joe; Rough buttonweed	<i>Diodia</i>	<i>teres</i>	
Virginia buttonweed	<i>Diodia</i>	<i>virginiana</i>	
Common persimmon	<i>Diospyros</i>	<i>virginiana</i>	
Saltgrass	<i>Distichlis</i>	<i>spicata</i>	
Dwarf sundew	<i>Drosera</i>	<i>brevifolia</i>	
Pink sundew	<i>Drosera</i>	<i>capillaris</i>	
Barnyard grass ⁺	<i>Echinochloa</i>	<i>crusgalli</i>	
Coast cockspur	<i>Echinochloa</i>	<i>walteri</i>	

Common name	Genus	Species	Variety/Subspp
False daisy	<i>Eclipta</i>	<i>prostrata</i>	
Needle spikerush	<i>Eleocharis</i>	<i>acicularis</i>	
White spikerush	<i>Eleocharis</i>	<i>albida</i>	
Gulf coast spikerush	<i>Eleocharis</i>	<i>cellulosa</i>	
Jointed spikerush	<i>Eleocharis</i>	<i>equisetoides</i>	
Pale spikerush; Yellow spikerush	<i>Eleocharis</i>	<i>flavescens</i>	
Knotted spikerush	<i>Eleocharis</i>	<i>interstincta</i>	
Small spikerush	<i>Eleocharis</i>	<i>minima</i>	
Sand spikerush	<i>Eleocharis</i>	<i>montevidensis</i>	
Viviparous spikerush	<i>Eleocharis</i>	<i>vivipara</i>	
Tall elephantsfoot	<i>Elephantopus</i>	<i>elatus</i>	
Indian goose grass ⁺	<i>Eleusine</i>	<i>indica</i>	
Virginia wildrye	<i>Elymus</i>	<i>virginicus</i>	
Pan-American balsamscale	<i>Elyonurus</i>	<i>tripsacoides</i>	
Thalia lovegrass ⁺	<i>Eragrostis</i>	<i>atrovirens</i>	
Red lovegrass	<i>Eragrostis</i>	<i>secundiflora</i>	subsp. <i>oxylepis</i>
Purple lovegrass	<i>Eragrostis</i>	<i>spectabilis</i>	
Coastal lovegrass	<i>Eragrostis</i>	<i>virginica</i>	
Fireweed; American burnweed	<i>Erechtites</i>	<i>hieracifolia</i>	
Early whitetop fleabane	<i>Erigeron</i>	<i>vernus</i>	
Tenangle pipewort	<i>Eriocaulon</i>	<i>decangulare</i>	
Michaux's cupgrass	<i>Eriochloa</i>	<i>michauxii</i>	var. <i>michauxii</i>
Baldwin's eryngo	<i>Eryngium</i>	<i>baldwinii</i>	
Coralbean, Cherokee bean	<i>Erythrina</i>	<i>herbacea</i>	
Dogfennel	<i>Eupatorium</i>	<i>capillifolium</i>	
Yankeeweed	<i>Eupatorium</i>	<i>compositifolium</i>	
Waxy thoroughwort	<i>Eupatorium</i>	<i>cuneifolium</i>	
Semaphore thoroughwort	<i>Eupatorium</i>	<i>mikanioides</i>	
Mohr's thoroughwort	<i>Eupatorium</i>	<i>mohrii</i>	
Roundleaf thoroughwort; False horehound	<i>Eupatorium</i>	<i>rotundifolium</i>	

Common name	Genus	Species	Variety/Subsp
Lateflowering thoroughwort	<i>Eupatorium</i>	<i>serotinum</i>	
Saltmarsh fingergrass	<i>Eustachys</i>	<i>glauca</i>	
Pinewoods fingergrass	<i>Eustachys</i>	<i>petraea</i>	
Slender goldenrod	<i>Euthamia</i>	<i>caroliniana</i>	
Flattop goldenrod	<i>Euthamia</i>	<i>graminifolia</i>	var. <i>hirtipes</i>
Bushy goldentop	<i>Euthamia</i>	<i>leptocephala</i>	
Slender fimbry	<i>Fimbristylis</i>	<i>autumnalis</i>	
Marsh fimbry	<i>Fimbristylis</i>	<i>spadicea</i>	
Cottonweed; Plains snakecotton	<i>Froelichia</i>	<i>floridana</i>	
Saltmarsh umbrellasedge	<i>Fuirena</i>	<i>breviseta</i>	
Southern umbrellasedge	<i>Fuirena</i>	<i>scirpoidea</i>	
Soft milkpea	<i>Galactia</i>	<i>mollis</i>	
Downy milkpea	<i>Galactia</i>	<i>volubilis</i>	
Coastal bedstraw	<i>Galium</i>	<i>hispidulum</i>	
Hairy bedstraw	<i>Galium</i>	<i>pilosum</i>	
Stiff marsh bedstraw	<i>Galium</i>	<i>tinctorium</i>	
Southern beeblossom	<i>Gaura</i>	<i>angustifolia</i>	
Dwarf huckleberry	<i>Gaylussacia</i>	<i>dumosa</i>	
Dangleberry	<i>Gaylussacia</i>	<i>frondosa</i>	var. <i>tomentosa</i>
Woolly huckleberry	<i>Gaylussacia</i>	<i>mosieri</i>	
Carolina cranesbill	<i>Geranium</i>	<i>carolinianum</i>	
Narrowleaf purple everlasting	<i>Gnaphalium</i>	<i>falcatum</i>	
Sweet everlasting; Rabbit tobacco	<i>Gnaphalium</i>	<i>obtusifolium</i>	
Pennsylvania everlasting	<i>Gnaphalium</i>	<i>pensylvanicum</i>	
Spoonleaf purple everlasting	<i>Gnaphalium</i>	<i>purpureum</i>	
Rough hedgehyssop	<i>Gratiola</i>	<i>hispidula</i>	
Innocence; Roundleaf bluet	<i>Hedyotis</i>	<i>procumbens</i>	
Clustered mille graine	<i>Hedyotis</i>	<i>uniflora</i>	
Bitterweed; Spanish daisy	<i>Helenium</i>	<i>amarum</i>	
Carolina frostweed	<i>Helianthemum</i>	<i>carolinianum</i>	
Pinebarren frostweed	<i>Helianthemum</i>	<i>corymbosum</i>	

Common name	Genus	Species	Variety/Subspp
Dune sunflower	<i>Helianthus</i>	<i>debilis</i>	subsp. <i>cucumerifolius</i>
Seaside heliotrope; Salt heliotrope	<i>Heliotropium</i>	<i>curassavicum</i>	
Indian heliotrope ⁺	<i>Heliotropium</i>	<i>indicum</i>	
Kidneyleaf mudplantain	<i>Heteranthera</i>	<i>reniformis</i>	
Camphorweed	<i>Heterotheca</i>	<i>subaxillaris</i>	
Swamp rosemallow	<i>Hibiscus</i>	<i>grandiflorus</i>	
Crimsoneyed rosemallow	<i>Hibiscus</i>	<i>moscheutos</i>	
Largeleaf marshpennywort	<i>Hydrocotyle</i>	<i>bonariensis</i>	
Floating marshpennywort	<i>Hydrocotyle</i>	<i>ranunculoides</i>	
Manyflower marshpennywort	<i>Hydrocotyle</i>	<i>umbellata</i>	
Swamp pennywort	<i>Hydrocotyle</i>	<i>verticillata</i>	
Swamp pennywort	<i>Hydrocotyle</i>	<i>verticillata</i>	var. <i>triradiata</i>
Coastalplain St. John's-wort	<i>Hypericum</i>	<i>brachyphyllum</i>	
Roundtop St. John's-wort	<i>Hypericum</i>	<i>cistifolium</i>	
Sandweed; Peelbark St. John's-wort	<i>Hypericum</i>	<i>fasciculatum</i>	
Bedstraw St. John's-wort	<i>Hypericum</i>	<i>galioides</i>	
Pineweeds; Orangegrass	<i>Hypericum</i>	<i>gentianoides</i>	
St. Andrew's-cross	<i>Hypericum</i>	<i>hypericoides</i>	
Flatwoods St. John's-wort	<i>Hypericum</i>	<i>microsepalum</i>	
Carolina St. John's-wort	<i>Hypericum</i>	<i>nitidum</i>	
Atlantic St. John's-wort	<i>Hypericum</i>	<i>reductum</i>	
Fourpetal St. John's-wort	<i>Hypericum</i>	<i>tetrapetalum</i>	
Fringed yellow stargrass	<i>Hypoxis</i>	<i>juncea</i>	
Musky mint; Clustered bushmint	<i>Hyptis</i>	<i>alata</i>	
Tropical bushmint ⁺	<i>Hyptis</i>	<i>mutabilis</i>	
Carolina holly	<i>Ilex</i>	<i>ambigua</i>	var. <i>ambigua</i>
Dahoon	<i>Ilex</i>	<i>cassine</i>	var. <i>cassine</i>
Myrtle dahoon	<i>Ilex</i>	<i>cassine</i>	var. <i>myrtifolia</i>
Large gallberry; Sweet gallberry	<i>Ilex</i>	<i>coriacea</i>	
Gallberry; Inkberry	<i>Ilex</i>	<i>glabra</i>	

Common name	Genus	Species	Variety/Subsp
American holly	<i>Ilex</i>	<i>opaca</i>	var. <i>opaca</i>
Yaupon	<i>Ilex</i>	<i>vomitaria</i>	
Jewelweed; Touch-me-not	<i>Impatiens</i>	<i>capensis</i>	
Cogon grass ⁺	<i>Imperata</i>	<i>cylindrica</i>	
Beach morningglory	<i>Ipomoea</i>	<i>imperati</i>	
Railroad vine; Bayhops	<i>Ipomoea</i>	<i>pes-caprae</i>	subsp. <i>brasiliensis</i>
Saltmarsh morningglory	<i>Ipomoea</i>	<i>sagittata</i>	
Prairie iris; Dixie iris	<i>Iris</i>	<i>hexagona</i>	
Virginia iris	<i>Iris</i>	<i>virginica</i>	
Bigleaf sumpweed	<i>Iva</i>	<i>frutescens</i>	
Seacoast marshelder	<i>Iva</i>	<i>imbricata</i>	
Tapertip rush	<i>Juncus</i>	<i>acuminatus</i>	
Toad rush	<i>Juncus</i>	<i>bufonius</i>	
Forked rush	<i>Juncus</i>	<i>dichotomus</i>	
Soft rush	<i>Juncus</i>	<i>effusus</i>	subsp. <i>solutus</i>
Bog rush; Elliott's rush	<i>Juncus</i>	<i>elliottii</i>	
Shore rush; Grassleaf rush	<i>Juncus</i>	<i>marginatus</i>	
Bighead rush	<i>Juncus</i>	<i>megacephalus</i>	
Needle rush; Black rush; Needlegrass rush	<i>Juncus</i>	<i>roemerianus</i>	
Needlepod rush	<i>Juncus</i>	<i>scirpoides</i>	
Path rush; Poverty rush	<i>Juncus</i>	<i>tenuis</i>	
Red cedar	<i>Juniperus</i>	<i>virginiana</i>	
Wicky; Hairy laurel	<i>Kalmia</i>	<i>hirsuta</i>	
Virginia Saltmarsh mallow	<i>Kosteletzkya</i>	<i>virginica</i>	
Virginia dwarfdandelion	<i>Krigia</i>	<i>virginica</i>	
Japanese clover ⁺	<i>Kummerowia</i>	<i>striata</i>	
Carolina redroot	<i>Lachnanthes</i>	<i>carolina</i>	
Grassleaf lettuce	<i>Lactuca</i>	<i>graminifolia</i>	
Thymeleaf pinweed	<i>Lechea</i>	<i>minor</i>	
Hairy pinweed	<i>Lechea</i>	<i>mucronata</i>	

Common name	Genus	Species	Variety/Subsp
Leggett's pinweed	<i>Lechea</i>	<i>pulchella</i>	
Pineland pinweed	<i>Lechea</i>	<i>sessiliflora</i>	
Piedmont pinweed	<i>Lechea</i>	<i>torreyi</i>	
Corkwood	<i>Leitneria</i>	<i>floridana</i>	
Little duckweed	<i>Lemna</i>	<i>obscura</i>	
Lion's-ear; Christmas candlestick ⁺	<i>Leonotis</i>	<i>nepetifolia</i>	
Virginia pepperweed	<i>Lepidium</i>	<i>virginicum</i>	
Bearded Sprangletop	<i>Leptochloa</i>	<i>fascicularis</i>	
Dusty clover; Roundhead lespedeza	<i>Lespedeza</i>	<i>capitata</i>	
Hairy lespedeza	<i>Lespedeza</i>	<i>hirta</i>	
Chapman's gayfeather	<i>Liatris</i>	<i>chapmanii</i>	
Shortleaf gayfeather	<i>Liatris</i>	<i>tenuifolia</i>	var. <i>tenuifolia</i>
Frog's-bit; American spongeplant	<i>Limnobiium</i>	<i>spongia</i>	
Asian marshweed ⁺	<i>Limnophila</i>	<i>sessiliflora</i>	
Carolina sealavender	<i>Limonium</i>	<i>carolinianum</i>	
Canada toadflax	<i>Linaria</i>	<i>canadensis</i>	
Apalachicola toadflax	<i>Linaria</i>	<i>floridana</i>	
Yellowseed false pimpernel	<i>Lindernia</i>	<i>dubia</i>	var. <i>anagallidea</i>
Stiff yellow flax	<i>Linum</i>	<i>medium</i>	var. <i>texanum</i>
West's flax	<i>Linum</i>	<i>westii</i>	
Smallflower halfchaff sedge	<i>Lipocarpha</i>	<i>micrantha</i>	
Sweetgum	<i>Liquidambar</i>	<i>styraciflua</i>	
Shortleaf lobelia	<i>Lobelia</i>	<i>brevifolia</i>	
Goldencrest	<i>Lophiola</i>	<i>aurea</i>	
Winged primrosewillow	<i>Ludwigia</i>	<i>alata</i>	
Seedbox	<i>Ludwigia</i>	<i>alternifolia</i>	
Spindleroot	<i>Ludwigia</i>	<i>hirtella</i>	
Anglestem primrosewillow	<i>Ludwigia</i>	<i>leptocarpa</i>	
Southeastern primrosewillow	<i>Ludwigia</i>	<i>linifolia</i>	
Seaside primrosewillow	<i>Ludwigia</i>	<i>maritima</i>	
Marsh seedbox	<i>Ludwigia</i>	<i>palustris</i>	

Common name	Genus	Species	Variety/Subsp
Creeping primrosewillow	<i>Ludwigia</i>	<i>repens</i>	
Skyblue lupine	<i>Lupinus</i>	<i>diffusus</i>	
Gulf coast lupine	<i>Lupinus</i>	<i>westianus</i>	var. <i>westianus</i>
Southern watergrass	<i>Luziola</i>	<i>fluitans</i>	
Christmasberry; Carolina desertthorn	<i>Lycium</i>	<i>carolinianum</i>	
Garden tomato ⁺	<i>Lycopersicon</i>	<i>esculentum</i>	
Japanese climbing fern ⁺	<i>Lygodium</i>	<i>japonicum</i>	
Rusty staggerbush	<i>Lyonia</i>	<i>ferruginea</i>	
Coastalplain staggerbush	<i>Lyonia</i>	<i>fruticosa</i>	
Fetterbush	<i>Lyonia</i>	<i>lucida</i>	
Southern magnolia	<i>Magnolia</i>	<i>grandiflora</i>	
Sweetbay	<i>Magnolia</i>	<i>virginiana</i>	
Angularfruit milkvine	<i>Matelea</i>	<i>gonocarpos</i>	
Black medick ⁺	<i>Medicago</i>	<i>lupulina</i>	
Creeping cucumber	<i>Melothria</i>	<i>pendula</i>	
Shade mudflower	<i>Micranthemum</i>	<i>umbrosum</i>	
Climbing hempvine	<i>Mikania</i>	<i>scandens</i>	
Twinberry; Partridgeberry	<i>Mitchella</i>	<i>repens</i>	
Lax hornpod	<i>Mitreola</i>	<i>petiolata</i>	
Carolina bristlemallow	<i>Modiola</i>	<i>caroliniana</i>	
Indian chickweed; Green carpetweed ⁺	<i>Mollugo</i>	<i>verticillata</i>	
Keygrass, Shoregrass	<i>Monanthochloe</i>	<i>littoralis</i>	
Spotted beebalm	<i>Monarda</i>	<i>punctata</i>	
Red mulberry	<i>Morus</i>	<i>rubra</i>	
Hairawn muhly	<i>Muhlenbergia</i>	<i>capillaris</i>	var. <i>capillaris</i>
Wax myrtle, Southern bayberry	<i>Myrica</i>	<i>cerifera</i>	
Southern waternymph	<i>Najas</i>	<i>guadalupensis</i>	
Wright's waternymph	<i>Najas</i>	<i>wrightiana</i>	
American lotus	<i>Nelumbo</i>	<i>lutea</i>	
Tropical puff	<i>Neptunia</i>	<i>pubescens</i>	
Florida beargrass	<i>Nolina</i>	<i>atopocarpa</i>	

Common name	Genus	Species	Variety/Subsp
Spatterdock; Yellow pondlily	<i>Nuphar</i>	<i>lutea</i>	
Yellow waterlily	<i>Nymphaea</i>	<i>mexicana</i>	
American white waterlily	<i>Nymphaea</i>	<i>odorata</i>	
Water tupelo	<i>Nyssa</i>	<i>aquatica</i>	
Ogeechee tupelo	<i>Nyssa</i>	<i>ogeche</i>	
Common eveningprimrose	<i>Oenothera</i>	<i>biennis</i>	
Seabeach eveningprimrose	<i>Oenothera</i>	<i>humifusa</i>	
False gromwell; Wild Job's Tears	<i>Onosmodium</i>	<i>virginianum</i>	
Woodsgrass; Basketgrass	<i>Oplismenus</i>	<i>hirtellus</i>	
Pricklypear	<i>Opuntia</i>	<i>humifusa</i>	
Cockspur pricklypear	<i>Opuntia</i>	<i>pusilla</i>	
Erect pricklypear	<i>Opuntia</i>	<i>stricta</i>	
Goldenclub; Neverwet	<i>Orontium</i>	<i>aquaticum</i>	
Wild olive; American devilwood	<i>Osmanthus</i>	<i>americanus</i>	
Cinnamon fern	<i>Osmunda</i>	<i>cinnamomea</i>	
Royal fern	<i>Osmunda</i>	<i>regalis</i>	var. <i>spectabilis</i>
Common yellow woodsorrel; Creeping woodsorrel	<i>Oxalis</i>	<i>corniculata</i>	
Water cowbane	<i>Oxypolis</i>	<i>filiformis</i>	
Bitter panicgrass	<i>Panicum</i>	<i>amarum</i>	
Beaked panicum	<i>Panicum</i>	<i>anceps</i>	
Gaping panicum	<i>Panicum</i>	<i>hians</i>	
Redtop panicgrass	<i>Panicum</i>	<i>longifolium</i>	
Torpedograss⁺	<i>Panicum</i>	<i>repens</i>	
Redtop panicum	<i>Panicum</i>	<i>rigidulum</i>	
Warty panicgrass	<i>Panicum</i>	<i>verrucosum</i>	
Switchgrass	<i>Panicum</i>	<i>virgatum</i>	
Clustered pellitory	<i>Parietaria</i>	<i>praetermissa</i>	
Baldwin's nailwort	<i>Paronychia</i>	<i>baldwinii</i>	
Squareflower	<i>Paronychia</i>	<i>erecta</i>	
Rugel's nailwort	<i>Paronychia</i>	<i>rugelii</i>	

Common name	Genus	Species	Variety/Subsp
Virginia creeper; Woodbine	<i>Parthenocissus</i>	<i>quinquefolia</i>	
Bull crowgrass	<i>Paspalum</i>	<i>boscianum</i>	
Knotgrass	<i>Paspalum</i>	<i>distichum</i>	
Florida paspalum	<i>Paspalum</i>	<i>floridanum</i>	
Bahia grass ⁺	<i>Paspalum</i>	<i>notatum</i>	var. <i>saurae</i>
Early paspalum	<i>Paspalum</i>	<i>praecox</i>	
Thin paspalum	<i>Paspalum</i>	<i>setaceum</i>	
Vaseygrass ⁺	<i>Paspalum</i>	<i>urvillei</i>	
Green arrow arum	<i>Peltandra</i>	<i>virginica</i>	
Red bay	<i>Persea</i>	<i>borbonia</i>	var. <i>borbonia</i>
Swamp bay	<i>Persea</i>	<i>palustris</i>	
Golden polypody	<i>Phlebodium</i>	<i>aureum</i>	
Red chokeberry	<i>Photinia</i>	<i>pyrifolia</i>	
Common reed	<i>Phragmites</i>	<i>australis</i>	
Capeweed; Turkey tangle fogfruit	<i>Phyla</i>	<i>nodiflora</i>	
Golden bamboo	<i>Phyllostachys</i>	<i>aurea</i>	
Cutleaf groundcherry	<i>Physalis</i>	<i>angulata</i>	
Coastal groundcherry	<i>Physalis</i>	<i>angustifolia</i>	
Husk tomato	<i>Physalis</i>	<i>pubescens</i>	
Walter's groundcherry	<i>Physalis</i>	<i>walteri</i>	
American pokeweed	<i>Phytolacca</i>	<i>americana</i>	
Fetterbush	<i>Pieris</i>	<i>phillyreifolia</i>	
Small butterwort	<i>Pinguicula</i>	<i>pumila</i>	
Sand pine	<i>Pinus</i>	<i>clausa</i>	
Slash pine	<i>Pinus</i>	<i>elliottii</i>	
Narrowleaf silkgrass	<i>Pityopsis</i>	<i>graminifolia</i>	
Virginia plantain; Southern plantain	<i>Plantago</i>	<i>virginica</i>	
Resurrection fern	<i>Pleopeltis</i>	<i>polypodioides</i>	var. <i>michauxiana</i>
Camphorweed	<i>Pluchea</i>	<i>camphorata</i>	
Stinking camphorweed	<i>Pluchea</i>	<i>foetida</i>	
Sweetscent	<i>Pluchea</i>	<i>odorata</i>	

Common name	Genus	Species	Variety/Subspp
Rosy camphorweed	<i>Pluchea</i>	<i>rosea</i>	
Rosebud orchid	<i>Pogonia</i>	<i>divaricata</i>	
Rose pogonia; Snakemouth orchid	<i>Pogonia</i>	<i>ophioglossoides</i>	
Paintedleaf; Fire-on-the-mountain	<i>Poinsettia</i>	<i>cyathophora</i>	
Baldwin's milkwort	<i>Polygala</i>	<i>balduinii</i>	
Littleleaf milkwort	<i>Polygala</i>	<i>brevifolia</i>	
Drumheads	<i>Polygala</i>	<i>cruciata</i>	
Procession flower	<i>Polygala</i>	<i>incarnata</i>	
Orange milkwort	<i>Polygala</i>	<i>lutea</i>	
Candyroot	<i>Polygala</i>	<i>nana</i>	
Tall jointweed	<i>Polygonella</i>	<i>gracilis</i>	
October flower	<i>Polygonella</i>	<i>polygama</i>	var. <i>brachystachya</i>
Pale smartweed; Curlytop knotweed	<i>Polygonum</i>	<i>lapathifolium</i>	
Dotted smartweed	<i>Polygonum</i>	<i>punctatum</i>	
Arrowleaf tearthumb	<i>Polygonum</i>	<i>sagittatum</i>	
Hairy leafcup	<i>Polymnia</i>	<i>uvedalia</i>	
Juniper leaf; Rustweed	<i>Polypremum</i>	<i>procumbens</i>	
Pickernelweed	<i>Pontederia</i>	<i>cordata</i>	
Pink purslane; Kiss-me-quick	<i>Portulaca</i>	<i>pilosa</i>	
Illinois pondweed	<i>Potamogeton</i>	<i>illinoensis</i>	
Sago pondweed	<i>Potamogeton</i>	<i>pectinatus</i>	
Claspingleaf pondweed	<i>Potamogeton</i>	<i>perfoliatus</i>	var. <i>blupleuroides</i>
Small pondweed	<i>Potamogeton</i>	<i>pusillus</i>	
Marsh mermaidweed	<i>Proserpinaca</i>	<i>palustris</i>	
Combleaf mermaidweed	<i>Proserpinaca</i>	<i>pectinata</i>	
Tailed bracken	<i>Pteridium</i>	<i>aquilinum</i>	var. <i>pseudocaudatum</i>
Blackroot	<i>Pterocaulon</i>	<i>pycnostachyum</i>	
Mock bishopsweed; Herbwilliam	<i>Ptilimnium</i>	<i>capillaceum</i>	
Chapman's oak	<i>Quercus</i>	<i>chapmanii</i>	
Southern red oak; Spanish oak	<i>Quercus</i>	<i>falcata</i>	

Common name	Genus	Species	Variety/Subsp
Sand live oak	<i>Quercus</i>	<i>geminata</i>	
Laurel oak; Diamond oak	<i>Quercus</i>	<i>laurifolia</i>	
Overcup oak	<i>Quercus</i>	<i>lyrata</i>	
Sand post oak	<i>Quercus</i>	<i>margaretta</i>	
Dwarf live oak	<i>Quercus</i>	<i>minima</i>	
Myrtle oak	<i>Quercus</i>	<i>myrtifolia</i>	
Water oak	<i>Quercus</i>	<i>nigra</i>	
Post oak	<i>Quercus</i>	<i>stellata</i>	
Virginia live oak	<i>Quercus</i>	<i>virginiana</i>	
Carolina buckthorn	<i>Rhamnus</i>	<i>caroliniana</i>	
West Indian meadowbeauty	<i>Rhexia</i>	<i>cubensis</i>	
Maid Marian	<i>Rhexia</i>	<i>nashii</i>	
Nuttall's meadowbeauty ⁺	<i>Rhexia</i>	<i>nuttallii</i>	
Fringed meadowbeauty	<i>Rhexia</i>	<i>petiolata</i>	
Winged sumac	<i>Rhus</i>	<i>copallinum</i>	
Least snoutbean	<i>Rhynchosia</i>	<i>minima</i>	
Anglestem beaksedge	<i>Rhynchospora</i>	<i>caduca</i>	
Bunched beaksedge	<i>Rhynchospora</i>	<i>cephalantha</i>	
Starrush whitetop	<i>Rhynchospora</i>	<i>colorata</i>	
Shortbristle horned beaksedge	<i>Rhynchospora</i>	<i>corniculata</i>	
Fascicled beaksedge	<i>Rhynchospora</i>	<i>fascicularis</i>	
Fernald's beaksedge	<i>Rhynchospora</i>	<i>fernaldii</i>	
Sandyfield beaksedge	<i>Rhynchospora</i>	<i>megalocarpa</i>	
Southern beaksedge	<i>Rhynchospora</i>	<i>microcarpa</i>	
Baldrush; Shortbeak beaksedge	<i>Rhynchospora</i>	<i>nitens</i>	
Fragrant beaksedge	<i>Rhynchospora</i>	<i>odorata</i>	
Plumed beaksedge	<i>Rhynchospora</i>	<i>plumosa</i>	
Tracy's beaksedge	<i>Rhynchospora</i>	<i>tracyi</i>	
Sawtooth blackberry	<i>Rubus</i>	<i>argutus</i>	
Southern dewberry	<i>Rubus</i>	<i>trivialis</i>	
Amamastla ⁺	<i>Rumex</i>	<i>chrysocarpus</i>	

Common name	Genus	Species	Variety/Subspp
Heartwing dock; Hastateleaf dock	<i>Rumex</i>	<i>hastatulus</i>	
Paraguayan dock ⁺	<i>Rumex</i>	<i>paraguayensis</i>	
Swamp dock	<i>Rumex</i>	<i>verticillatus</i>	
Widgeongrass	<i>Ruppia</i>	<i>maritima</i>	
Cabbage palm	<i>Sabal</i>	<i>palmetto</i>	
Marsh rosegentian	<i>Sabatia</i>	<i>dodecandra</i>	
Rose-of-Plymouth	<i>Sabatia</i>	<i>stellaris</i>	
Plumegrass	<i>Saccharum</i>	<i>coarctatum</i>	
Sugarcane plumegrass	<i>Saccharum</i>	<i>giganteum</i>	
American cupscale	<i>Sacciolepis</i>	<i>striata</i>	
Smallflower mock buckthorn	<i>Sageretia</i>	<i>minutiflora</i>	
Grassy arrowhead	<i>Sagittaria</i>	<i>graminea</i>	var. <i>graminea</i>
Bulltongue arrowhead	<i>Sagittaria</i>	<i>lancifolia</i>	subsp. <i>lancifolia</i>
Duck potato; Broadleaf arrowhead; common arrowhead	<i>Sagittaria</i>	<i>latifolia</i>	var. <i>latifolia</i>
Duck potato; Broadleaf arrowhead; common arrowhead	<i>Sagittaria</i>	<i>latifolia</i>	var. <i>pubescens</i>
Perennial glasswort; Virginia glasswort	<i>Salicornia</i>	<i>perennis</i>	
Coastalplain willow; Carolina willow	<i>Salix</i>	<i>caroliniana</i>	
Prickly Russian thistle ⁺	<i>Salsola</i>	<i>kali</i>	subsp. <i>Pontica</i>
Lyreleaf sage	<i>Salvia</i>	<i>lyrata</i>	
Elderberry; American Elder	<i>Sambucus</i>	<i>canadensis</i>	
Pineland pimpernel; Seaside brookweed	<i>Samolus</i>	<i>valerandi</i>	subsp. <i>parviflorus</i>
Canadian blacksnakeroot	<i>Sanicula</i>	<i>canadensis</i>	
Soapberry	<i>Sapindus</i>	<i>saponaria</i>	
Chinese Tallowtree; Popcorn tree ⁺	<i>Sapium</i>	<i>sebiferum</i>	
Lizard's tail	<i>Saururus</i>	<i>cernuus</i>	
Little bluestem	<i>Schizachyrium</i>	<i>scoparium</i>	var. <i>scoparium</i>
American bulrush	<i>Scirpus</i>	<i>americanus</i>	
Giant bulrush; California bulrush	<i>Scirpus</i>	<i>californicus</i>	

Common name	Genus	Species	Variety/Subsp
Threesquare bulrush	<i>Scirpus</i>	<i>pungens</i>	
Saltmarsh bulrush	<i>Scirpus</i>	<i>robustus</i>	
Softstem bulrush	<i>Scirpus</i>	<i>tabernaemontani</i>	
Fringed nutrush	<i>Scleria</i>	<i>ciliata</i>	
Fewflower nutrush	<i>Scleria</i>	<i>ciliata</i>	var. <i>pauciflora</i>
Netted nutrush	<i>Scleria</i>	<i>reticularis</i>	
Tall nutgrass; Whip nutrush	<i>Scleria</i>	<i>triglomerata</i>	
Low nutrush	<i>Scleria</i>	<i>verticillata</i>	
Sweetbroom; Licoriceweed	<i>Scoparia</i>	<i>dulcis</i>	
Helmet skullcap	<i>Scutellaria</i>	<i>integrifolia</i>	
Maryland wild sensitive plant	<i>Senna</i>	<i>marilandica</i>	
Saw palmetto	<i>Serenoa</i>	<i>repens</i>	
Danglepod	<i>Sesbania</i>	<i>herbacea</i>	
Rattlebox ⁺	<i>Sesbania</i>	<i>punicea</i>	
Bladderpod; Bagpod	<i>Sesbania</i>	<i>vesicaria</i>	
Slender seapurslane	<i>Sesuvium</i>	<i>maritimum</i>	
Shoreline seapurslane	<i>Sesuvium</i>	<i>portulacastrum</i>	
Coral foxtail; Coral bristlegrass	<i>Setaria</i>	<i>macrosperma</i>	
Giant bristlegrass	<i>Setaria</i>	<i>magna</i>	
Knotroot foxtail; Yellow bristlegrass	<i>Setaria</i>	<i>parviflora</i>	
Green foxtail; Green bristlegrass; Foxtail millet ⁺	<i>Setaria</i>	<i>viridis</i>	
Indian hemp; Cuban jute	<i>Sida</i>	<i>rhombofolia</i>	
Gum bully	<i>Sideroxylon</i>	<i>lanuginosum</i>	
Sleepy catchfly	<i>Silene</i>	<i>antirrhina</i>	
Narrowleaf blueeyed grass	<i>Sisyrinchium</i>	<i>angustifolium</i>	
Earleaf greenbrier	<i>Smilax</i>	<i>auriculata</i>	
Saw greenbrier	<i>Smilax</i>	<i>bona-nox</i>	
Bamboo vine; Laurel greenbrier	<i>Smilax</i>	<i>laurifolia</i>	
Jackson vine; Lanceleaf greenbrier	<i>Smilax</i>	<i>smallii</i>	
Hogbrier; Bristly greenbrier	<i>Smilax</i>	<i>tamnoides</i>	

Common name	Genus	Species	Variety/Subspp
Chapman's goldenrod	<i>Solidago</i>	<i>odora</i>	var. <i>chapmanii</i>
Sweet goldenrod; Aniscented goldenrod	<i>Solidago</i>	<i>odora</i>	var. <i>odora</i>
Seaside goldenrod	<i>Solidago</i>	<i>sempervirens</i>	
Wand goldenrod	<i>Solidago</i>	<i>stricta</i>	
Spiny sowthistle ⁺	<i>Sonchus</i>	<i>asper</i>	
Common sowthistle ⁺	<i>Sonchus</i>	<i>oleraceus</i>	
Slender indiagrass	<i>Sorghastrum</i>	<i>elliottii</i>	
Yellow indiagrass	<i>Sorghastrum</i>	<i>nutans</i>	
Lopsided Indiangrass	<i>Sorghastrum</i>	<i>secundum</i>	
Saltmarsh cordgrass; Smooth cordgrass	<i>Spartina</i>	<i>alterniflora</i>	var. <i>glabra</i>
Sand cordgrass	<i>Spartina</i>	<i>bakeri</i>	
Big cordgrass	<i>Spartina</i>	<i>cynosuroides</i>	
Saltmeadow cordgrass; Marshhay cordgrass	<i>Spartina</i>	<i>patens</i>	
Gulf cordgrass	<i>Spartina</i>	<i>spartinae</i>	
Roughfruit scaleseed	<i>Spermolepis</i>	<i>divaricata</i>	
Bristly scaleseed	<i>Spermolepis</i>	<i>echinata</i>	
Prairie wedgescale	<i>Sphenopholis</i>	<i>obtusata</i>	
Greenvein ladiestresses	<i>Spiranthes</i>	<i>praecox</i>	
Common duckweed	<i>Spirodela</i>	<i>polyrhiza</i>	
Florida dropseed	<i>Sporobolus</i>	<i>floridanus</i>	
Smutgrass ⁺	<i>Sporobolus</i>	<i>indicus</i>	
Seashore dropseed	<i>Sporobolus</i>	<i>virginicus</i>	
Prostrate starwort	<i>Stellaria</i>	<i>prostrata</i>	
Corkwood; Water toothleaf	<i>Stillingia</i>	<i>aquatica</i>	
Pineland scalypink	<i>Stipulicida</i>	<i>setacea</i>	
Trailing fuzzybean	<i>Strophostyles</i>	<i>helvula</i>	
Slickseed fuzzybean	<i>Strophostyles</i>	<i>leiosperma</i>	
Sea blite; Annual seepweed	<i>Suaeda</i>	<i>linearis</i>	
Pond-cypress	<i>Taxodium</i>	<i>ascendens</i>	

Common name	Genus	Species	Variety/Subsp
Bald-cypress	<i>Taxodium</i>	<i>distichum</i>	
Wood sage; Canadian germander	<i>Teucrium</i>	<i>canadense</i>	
Fireflag; Alligatorflag	<i>Thalia</i>	<i>geniculata</i>	
Marsh fern	<i>Thelypteris</i>	<i>palustris</i>	var. <i>pubescens</i>
Spanish moss	<i>Tillandsia</i>	<i>usneoides</i>	
Eastern poison ivy	<i>Toxicodendron</i>	<i>radicans</i>	
Forked bluecurls	<i>Trichostema</i>	<i>dichotomum</i>	
Tall redtop; Purpletop tridens	<i>Tridens</i>	<i>flavus</i>	
Arrowgrass	<i>Triglochin</i>	<i>striata</i>	
Clasping Venus' lookingglass	<i>Triodanis</i>	<i>perfoliata</i>	
Perennial sandgrass	<i>Triplasis</i>	<i>americana</i>	
Purple sandgrass	<i>Triplasis</i>	<i>purpurea</i>	
Southern cattail	<i>Typha</i>	<i>domingensis</i>	
Broadleaf cattail	<i>Typha</i>	<i>latifolia</i>	
American elm; Florida elm	<i>Ulmus</i>	<i>americana</i>	
Seaoats	<i>Uniola</i>	<i>paniculata</i>	
Leafy bladderwort	<i>Utricularia</i>	<i>foliosa</i>	
Humped bladderwort	<i>Utricularia</i>	<i>gibba</i>	
Eastern purple bladderwort	<i>Utricularia</i>	<i>purpurea</i>	
Lavender bladderwort; Small purple bladderwort	<i>Utricularia</i>	<i>resupinata</i>	
Zigzag bladderwort	<i>Utricularia</i>	<i>subulata</i>	
Sparkleberry; Farkleberry	<i>Vaccinium</i>	<i>arboreum</i>	
Highbush blueberry	<i>Vaccinium</i>	<i>corymbosum</i>	
Darrow's blueberry	<i>Vaccinium</i>	<i>darrowii</i>	
Shiny blueberry	<i>Vaccinium</i>	<i>myrsinites</i>	
Deerberry	<i>Vaccinium</i>	<i>stamineum</i>	
Tapegrass; American eelgrass	<i>Vallisneria</i>	<i>americana</i>	
White vervain	<i>Verbena</i>	<i>urticifolia</i>	
Yellow crownbeard	<i>Verbesina</i>	<i>occidentalis</i>	
Frostweed; White crownbeard	<i>Verbesina</i>	<i>virginica</i>	

Common name	Genus	Species	Variety/Subspp
Neckweed	<i>Veronica</i>	<i>peregrina</i>	
Fourleaf vetch	<i>Vicia</i>	<i>acutifolia</i>	
Hairy pod cowpea	<i>Vigna</i>	<i>luteola</i>	
Bog white violet	<i>Viola</i>	<i>lanceolata</i>	
Summer grape	<i>Vitis</i>	<i>aestivalis</i>	
Muscadine	<i>Vitis</i>	<i>rotundifolia</i>	
Frost grape	<i>Vitis</i>	<i>vulpina</i>	
Sixweeks fescue	<i>Vulpia</i>	<i>octoflora</i>	
Chinese wisteria ⁺	<i>Wisteria</i>	<i>sinensis</i>	
Virginia chain fern	<i>Woodwardia</i>	<i>virginica</i>	
Shortleaf yelloweyed grass	<i>Xyris</i>	<i>brevifolia</i>	
Carolina yelloweyed grass	<i>Xyris</i>	<i>caroliniana</i>	
Drummond's yelloweyed grass	<i>Xyris</i>	<i>drummondii</i>	
Irisleaf yelloweyed grass	<i>Xyris</i>	<i>iridifolia</i>	
Richard's yelloweyed grass ⁺	<i>Xyris</i>	<i>jupicai</i>	
Pineland yelloweyed grass	<i>Xyris</i>	<i>stricta</i>	
Spanish bayonet; Aloe yucca	<i>Yucca</i>	<i>aloifolia</i>	
Moundlily yucca	<i>Yucca</i>	<i>gloriosa</i>	
Horned pondweed	<i>Zannichellia</i>	<i>palustris</i>	
Hercules'-club	<i>Zanthoxylum</i>	<i>clava-herculis</i>	
Indian rice; Annual wild rice	<i>Zizania</i>	<i>aquatica</i>	
Seawrack	<i>Zostera</i>	<i>marina</i>	

+ Not Native

Appendix J. Budget Requests

The refuge's budget requests are contained in the Service's Refuge Operating Needs System (RONS) and Service Asset and Maintenance Management System (SAMMS) databases that include a wide variety of new and maintenance refuge projects. The RONS and SAMMS lists are constantly updated and include priority projects. Contact the refuge for the most current RONS and SAMMS lists. See Chapter V, Plan Implementation, of the Draft CCP for the key budget requests associated with the proposed projects and staffing.

Appendix K. List of Preparers

James Burnett, *Project Leader*, North Florida Refuges Complex

Shelly Stiaes, *Refuge Manager*, St. Vincent NWR

Charlotte Chumney, *Office Assistant*, St. Vincent NWR

Bradley Smith, *Biological Science Technician*, St. Vincent NWR

Mike Keys, *Biologist*, St. Marks NWR

Robin Will, *Supervisory Park Ranger*, St. Marks NWR

Joe Reinman, *Wildlife Biologist*, St. Marks NWR

Greg Titus, *Fire Management Officer*, St. Marks NWR

Frank Parauka, *retired Fisheries Biologist*, Panama City Ecological Services Office

Harold Mitchell, *Biologist*, Panama City Ecological Services Office

Monica Harris, *former Natural Resource Planner*, FWS Southeast Regional Office

Laura Housh, *Natural Resource Planner*, FWS Southeast Regional Office /Okefenokee NWR

Gayle Martin, *GIS/Biologist*, Panama City Ecological Services Office

Paul Lang, *GIS/Biologist*, Panama City Ecological Services Office

Evelyn Nelson, *Editor*, FWS Southeast Regional Office

Randy Musgraves, *Graphic Designer*, FWS Southeast Regional Office

Rose Hopp, *Senior Planner*, FWS Southeast Regional Office

