

# St. Andrews State Park

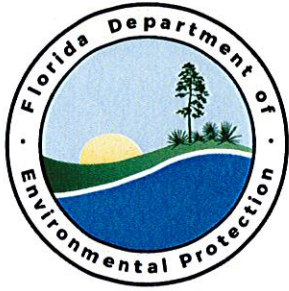
## APPROVED Unit Management Plan

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks  
April 2016







## Florida Department of Environmental Protection

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

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April 28, 2016

Ms. Sine Murray  
Division of Recreation and Parks  
Department of Environmental Protection  
3900 Commonwealth Boulevard, MS 525  
Tallahassee, Florida 32399-3000

**RE: St. Andrews State Park - Lease #3642**

Dear Ms. Murray:

On **April 22, 2016**, the Acquisition and Restoration Council recommended approval of the **St. Andrews State Park** management plan. Therefore, the Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **St. Andrews State Park** management plan. The next management plan update is due April 22, 2026.

Approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

A handwritten signature in cursive script that reads "Joseph P. Wilson".

Joseph P. Wilson, Chief  
Office of Environmental Services  
Division of State Lands



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## INTRODUCTION

St. Andrews State Park is located in Bay County at the pass between St. Andrew Bay and the Gulf of Mexico (see Vicinity Map). The park is comprised of lands on both the mainland and Shell Island. Access to the park is from State Road 392 (Thomas Drive) (see Reference Map). The Shell Island portion of the park is accessible only by boat. The Vicinity Map also reflects significant land and water resources existing near the park.

St. Andrews State Park was initially acquired on August 23, 1946. Currently, the park consists of 1,167 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park, and on September 28, 1967, the Trustees leased (Lease Number 3642) the property to DRP under a 50-year lease. The current lease will expire on December 20, 2034.

St. Andrews State Park is designated single-use in accordance with 253.034(2)a F.S. to provide public outdoor recreation and other park-related uses. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

### Purpose and Significance of the Park

St. Andrews State Park was acquired to provide exceptional resource-based public outdoor recreation opportunities to Florida residents and visitors while ensuring the conservation and protection of valuable natural resources, including imperiled species and unique ecosystems, in a fast-growing region in the Florida Panhandle.

### Park Significance

- St. Andrews State Park consistently ranks among the five most visited parks in the Florida State Park system and offers remarkable resource-based public outdoor recreation opportunities unique to its location at the confluence of St. Andrew Bay and the Gulf of Mexico.
- The park protects one of the largest segments of undeveloped barrier island along the central Florida Panhandle. Over four miles of pristine beaches along Shell Island and several miles of shoreline along St. Andrew Bay provide habitat for a number of imperiled species including the Gulf saltmarsh snake (*Nerodia clarkii clarkii*), least tern (*Sternula antillarum*), snowy plover (*Charadrius nivosus*), Choctawhatchee beach mouse (*Peromyscus polionotus allophtys*), and nesting opportunities for many sea turtles.
- The park protects and interprets a broad range of significant and exemplary natural community types, including estuarine tidal marsh, freshwater depression marsh, scrub, maritime hammock, beach dune, and rare coastal dune lakes.
- The park preserves and interprets a wide-ranging variety of important cultural sites, including Weeden Island and Fort Walton period shell mounds, remnants of a mid-20<sup>th</sup> century zoo, and two military gun mounts that served as part of the Panama City Harbor Defense during World War II.

St. Andrews State Park is classified as a recreation area in the DRP's unit classification system. In the management of a state recreation area, major emphasis is placed on maximizing the recreational potential of the unit. However, preservation of the park's natural and cultural resources remains important. Depletion of a resource by any recreational activity is not permitted. In order to realize the park's recreational potential the development of appropriate park facilities is undertaken with the goal to provide facilities that are accessible, convenient and safe, to support public recreational use or appreciation of the park's natural, aesthetic and educational attributes.

### **Purpose and Scope of the Plan**

This plan serves as the basic statement of policy and direction for the management of St. Andrews State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2004 approved plan.

The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and issues are identified, and measurable management objectives are established for each of the park's management goals and resource types. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, imperiled species management, cultural resource management and restoration of natural conditions.

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural and cultural resources of the park, current public uses and existing development, measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as the volume of public use to be provided.

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate the DRP's implementation progress, (2) timeframes for completing actions and objectives and (3) estimated costs to complete each action and objective.



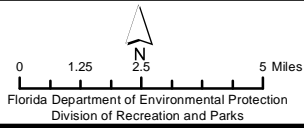
**Legend**

- Park Boundary
- Interstates
- FDOT US Routes
- FDOT State Routes
- FDOT Local Roads
- Conservation and Recreation Lands**
- Federal Managed Lands
- State Managed Lands
- Local Managed Lands
- Private Managed Lands
- Aquatic Preserves
- Land Use**
- Developed
- Undeveloped

Sources: Florida Natural Areas Inventory, 2015  
Florida Land Use Covers and Forms Classification System, 2004



**ST. ANDREWS  
STATE PARK**



**VICINITY  
MAP**





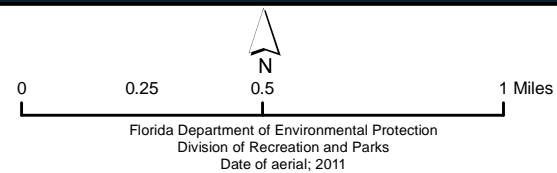
**LEGEND**

- Florida Circumnavigational Saltwater Paddling Trail
- Coastal Construction Control Line (CCCL)
- Managed Conservation Land
- Park Boundary

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ST. ANDREWS STATE PARK



REFERENCE MAP  
DRAFT



All development and resource alteration proposed in this plan is subject to the granting of appropriate permits, easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes, and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park's natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. It was determined that St. Andrews State Park could be the recipient of gopher tortoises relocated from offsite to conserve this imperiled species. This activity could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation and is addressed in the Resource Management Component of the plan. Uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that receiving of gopher tortoises relocated from offsite would be appropriate at this park as additional sources of revenue for land management since they are compatible with the park's primary purpose of resource-based outdoor recreation and conservation.

DRP may provide the services and facilities outlined in this plan either with its own funds and staff or through an outsourcing contract. Private contractors may provide assistance with natural resource management and restoration activities or a concessionaire may provide services to park visitors in order to enhance the visitor experience. For example, a concessionaire could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A concessionaire may also be authorized to provide specialized services, such as interpretive tours, or overnight accommodations when the required capital investment exceeds that which DRP can elect to incur. Decisions regarding outsourcing, contracting with the private sector, the use of concessionaires, etc., are made on a case-by-case basis in accordance with the policies set forth in DRP's Operations Manual (OM).

## Management Program Overview

### Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (DRP) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

*It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.*

Since 1988, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) has granted management authority of certain sovereign submerged lands to the DRP under Management Agreement MA 68-086. The management area includes a buffer zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely affect public recreational uses.

At St. Andrews State Park, certain management activities are needed within the buffer zone of sovereign submerged land along the entire shoreline, beginning at the mean high water or ordinary high water line, or from the edge of emergent vegetation and extending waterward for 50 feet. The submerged resources within the buffer zone contain significant species diversity and provide recreational opportunities for park visitors. Management actions occurring within the buffer zone will be limited to patrolling for removal of trash, litter, and other debris, public safety and emergency response activities, and monitoring natural and cultural resources.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in the OM that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.



## **Park Management Goals**

The following park goals express DRP's long-term intent in managing the state park:

- Provide administrative support for all park functions.
- Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.
- Maintain, improve or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

## **Management Coordination**

The park is managed in accordance with all applicable laws and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FWC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within the park. In addition, the FWC aids DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The Florida Department of Environmental Protection (DEP), Florida Coastal Office (FCO) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Coastal Systems aids staff in planning and construction activities seaward of the Coastal Construction Control Line (CCCL). In addition, the Bureau of Beaches and Coastal Systems aid the staff in the development of erosion control projects.

## **Public Participation**

DRP solicited preliminary public input by conducting a preliminary public workshop on December 3, 2014 in Panama City. The purpose of this meeting was to gather input for the plan at the beginning of the management planning process. DRP also conducted a series of two advisory group meetings from July 2015 to August 2015 as part of the development of this management plan update. DRP conducted a final public hearing on Wednesday, March 16, 2016 to gather comments on the draft management plan update. On Thursday, March 17, DRP held a final Advisory Group

meeting to gather comments on the draft management plan amendment from appointed advisory group members (see Addendum 2). Meeting notices were published in the Florida Administrative Register, Volume 42, Issue 46, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally.

### **Other Designations**

St. Andrews State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation. The park is a component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this park are also classified as Class III waters by the Department. This park is adjacent to St. Andrews Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (Section 258.35, Florida Statutes).

## RESOURCE MANAGEMENT COMPONENT

### Introduction

The Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) in accordance with Chapter 258, Florida Statutes, has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. Management measures expressed in this plan are consistent with the DRP's overall mission in natural systems management. Cited references are contained in Addendum 3.

The DRP's philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management for imperiled species is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes and should not imperil other native species or seriously compromise the park values.

The DRP's management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events or persons. This goal often entails active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts.

The entire park is divided into management zones that delineate areas on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community type, burn zone, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

<b>Management Zone</b>	<b>Acreage</b>	<b>Managed with Prescribed Fire</b>	<b>Contains Known Cultural Resources</b>
SA-A	38.99	Y	Y
SA-B	5.22	Y	N
SA-C	126.94	Y	N
SA-D	4.43	Y	N
SA-E	8.7	Y	Y
SA-F	39.17	Y	Y
SA-G	12.96	Y	N
SA-H	49.7	Y	N
SA-I	30.89	N	Y
SA-J	43.75	Y	N
SA-K	77.47	N	Y
SA-L	19.83	N	N
SA-M	10.01	N	N
SA-N	457.85	Y	Y
SA-O	243.97	N	Y

## **RESOURCE DESCRIPTION AND ASSESSMENT**

### **Natural Resources**

#### **Topography**

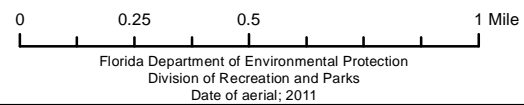
St. Andrews State Park lies within the Coastal Lowlands physiographic region which is low in elevation and poorly drained. The Coastal Lowlands form the entire coastline and reach inland as much as sixty miles at some points. The topography of the area was formed during the Pleistocene epoch and is composed of ancient marine terraces that run parallel to the Gulf of Mexico shoreline. The terraces were formed long ago by waves, currents and varying sea levels. When the sea level remained stationary for long periods of time, the waves and currents eroded the sea floor to form fairly level surfaces. When the sea level dropped, the sea floor became a level plain or terrace.

The coastline of Florida has shifted significantly both seaward and landward in the past five million years. Many of topographic features apparent today were formed when sea levels were higher. The relic dunes and swales which parallel the Gulf shore throughout the habitat are an example. The park is relatively flat except where old dune ridges occur or where the surface has been modified by erosion and underground solution. The park's highest elevations are dune ridges, with a rise of approximately 35 feet.



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ST. ANDREWS STATE PARK



MANAGEMENT ZONES MAP



The most notable topographic features at St. Andrews State Park are dunes along the landward edge of the Gulf beach as well as more interior areas of the beach dune community. Elevations along the established beach dunes can build to well over 25 feet during long periods between major land falling storm events. However, tropical cyclone events, such as Hurricane Opal in 1995, Hurricane Ivan in 2004, and Hurricane Dennis in 2005, caused significant damage and erosion to the primary dunes of the park.

## **Geology**

Puri and Vernon (1964) placed the park within the Gulf Coast Lowlands geomorphic province. The landforms in this province are comprised of barrier islands, coastal ridges, estuaries, lagoons, relict spits and berms, and sand dune ridges, parallel to the present coast line, indicative that these features were formed in a prehistoric coastal environment. Features within this province are primarily flat in relief, poorly drained and are mostly covered with Pleistocene to recent quartz sands. Most of the area is covered with reworked quartz from the various marine terraces that are present in the vicinity. Over time, these sands have been reworked and sculpted by the forces of nature, including hurricanes, into the landscape we see today.

## **Soils**

The soils throughout the park are nearly level to gently sloping. The extent to which the soils are drained ranges from excessive, to moderate, to poor. Most of the soils consist of sands with fairly deep profiles. Five soil types are found at the park (see Soils Map). A detailed description of these soil types is contained in Addendum 4. The soils at St. Andrews State Park are: Rutlege sand, Osier fine sand, Beaches, Fripp-Corolla complex, and Bayvi loamy sand (see Soils Map).

Resource management measures that restore enhance and maintain intact native plant communities will largely provide for the conservation of soil resources and control soil erosion. Visitor access trails and resource management roads, where necessary, are designed, placed, and maintained to avoid acceleration and channelization of surface waters that could lead to gully erosion.

While erosion and reshaping of the beach dune community are considered to be part of the natural process of this storm influenced dynamic coastline, DRP has worked to enhance the recovery of primary dunes following tropical storm or hurricane events in recent decades. Major sea oat planting projects were successfully implemented, contributing to rapid re-establishment and growth of the primary dune line along the storm lashed Gulf of Mexico. Future plans for renourishing the park's beach dune community will be similarly implemented as necessary.

Beach sands erode and accrete over time at this unit due to Hurricanes and natural wave action. Currently St. Andrews State Park appears to be impacted by storm activity on a 10-year cycle. A jetty-armored inlet was cut in the 1930s, severing the

existing peninsula and creating Shell Island. Although the jetty helps maintain shoreline stabilization, the jetties have also resulted in down drift erosion problems. In general, the shorelines of the channel are subject to high energy wave action, resulting in considerable erosion on the mainland shore between Gator Lake and the shipping channel (between SA-J and SA-M). Any future significant weather events could breach this narrow barrier and result in draining of Gator Lake. The U.S. Army Corps of Engineers is responsible for maintenance dredging of the channel and renourishes the beaches of this unit with sand that has washed into the channel on a three-to-six-year rotation, which helps offset this situation. The bay shoreline at the park is heavily eroding in locations along the mainland and Shell Island, impacting infrastructure, cultural resources, and habitats sensitive to salt water intrusion.

### **Minerals**

There are no minerals of commercial value within the park.

### **Hydrology**

The park is bounded on the south by the Gulf of Mexico and on the north by St. Andrew Bay. St. Andrew Bay is a high-salinity estuarine system. The St. Andrew Bay system is made up of four hydrologically linked bays—West Bay, North Bay, East Bay, and St. Andrew Bay proper. St. Andrew Bay is connected to the Gulf of Mexico through the man-made and maintained west pass (St. Andrew channel) and the intermittent east pass, and it branches inland into the East, North, and West segments. There are no major riverine inputs to St. Andrew Bay, but minor sources of freshwater inflow include Econfina Creek, Deer Point Lake Reservoir (the primary source of drinking water for Bay County), the Gulf Intracoastal Waterway (GIWW), and smaller creeks and bayous. The small volume of freshwater input is responsible for minimal sediment loading. The low sediment load results in low turbidity and very clear waters, which in turn support extensive seagrass beds. Other factors that contribute to the bay's clarity are its spring-fed tributaries, low amounts of silty clay in local soils, and the filtering effect of the seagrass beds and marshes.








Prior to the west pass-St. Andrew channel project, the bay system was connected to the Gulf through the east pass at the eastern end of what is now Shell Island. During the more than 70 years since the channel construction, the eastern end of Shell Island has accreted to the present state in which water flow has been effectively cut off. The entire regional drainage now flows through the ship channel, between the two segments of the park into the Gulf of Mexico.

The park contains one freshwater coastal dune lake on Shell Island (SA-N), one freshwater impoundment: Gator Lake (SA-J), and various freshwater marshes and swales. Gator Lake is located on the mainland portion of the park, to the southeast



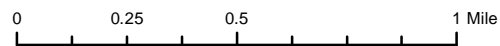


**Legend**

	29 - Rutlege sand, very poorly drained
	31 - Osier fine sand, poorly drained
	43 - Urban land
	44 - Beaches, poorly drained
	48 - Fripp-Corolla complex, 2 to 30 percent slopes, excessively drained
	52 - Bayvi loamy sand, very poorly drained
	99 - Water

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ST. ANDREWS STATE PARK



Florida Department of Environmental Protection  
 Division of Recreation and Parks  
 Date of aerial, 2011

SOILS MAP



of Buttonbush Marsh (SA-C). The Gator Lake impoundment was created through the deposition of spoil when the channel between the mainland and Shell Island was dredged by the U.S. Army Corps of Engineers between 1933-34. The hydrology of the coastal dune lake on Shell Island is intact and connects to the surrounding basin marsh habitat. Historically there was a second coastal dune lake, however this lake was lost when the channel was created.

The park road bisects the Buttonbush Marsh (SA-C) on the mainland. Although the construction of the road impounded the marsh to some extent, culverts were put in place along the road to reestablish hydrological flow. The culverts are small in size and do require periodic maintenance due to the accumulation of sand and other debris that blocks water flow. The culverts should be evaluated to ensure there is sufficient water flow between the various sections of basin marsh habitat.

The flatwoods community along the north boundary of the park (SA-H) is altered by storm runoff culverts coming from neighboring development. The area is significantly altered and the storm runoff drains into the surrounding natural communities. Reclamation should be conducted and a coordinated effort to redirect the storm runoff is needed.

### **Natural Communities**

This section of the management plan describes and assesses each of the natural communities found in the state park. It also describes of the desired future condition (DFC) of each natural community and identifies the actions that will be required to bring the community to its desired future condition. Specific management objectives and actions for natural community management, exotic species management, imperiled species management and population restoration are discussed in the Resource Management Program section of this component.

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology, and fire frequency generally determine the species composition of an area, and that areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

When a natural community within a park reaches the desired future condition, it is considered to be in a "maintenance condition." Required actions for sustaining a community's maintenance condition may include; maintaining optimal fire return intervals for fire dependant communities, ongoing control of non-native plant and animal species, maintaining natural hydrological functions (including historic water

flows and water quality), preserving a community's biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones that link natural communities across the landscape.

The park contains 14 distinct natural communities as well as altered landcover types (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

## **SCRUB**

*Desired future condition:* Dominant species over the park's scrub acreage include sand live oak, myrtle oak, Chapman's oak (*Quercus chapmanii*), Choctawhatchee sand pine (*Pinus clausa* var. *immuginata*), saw palmetto, and Florida rosemary. Scrub occurs on dry sandy ridges that display large open bare sand patches. The fire return interval for stand replacement fires in scrub on the peninsula of Florida is 4-15 years, but there is no evidence that fire is an important process that shapes the coastal scrub in the Florida panhandle (Drewa et al. 2008; Parker et al. 2001). Coastal processes such as salt spray and tropical force winds are believed to play more of a role in regulating Panhandle scrub than fire (Parker et al. 2001; Huck et al. 1997; FNAI 2010). Vegetation damaged by high winds and salt spray create gaps in the canopy for recruitment where seeds can germinate and grow. Non-serotinous cones exhibited by Choctawhatchee sand pine (panhandle sand pine) allow for continuous seed source that is not dependent on fire for release. Research focusing on the pyric nature of panhandle coastal scrub suggests that this natural community does not require fire as a disturbance.

In scrub adjacent to beach dunes, a contiguous mature cover of seed producing scrub shrubs provide important refugia for the Choctawhatchee beach mice during and after tropical storms that damage the primary dunes. This oak scrub found on the sandy ridges closest to the Gulf of Mexico is most influenced by salt spray that "prunes" or shapes the structure of the evergreen oaks, preventing them from becoming tall, and creating patches of dead vegetation. Over long periods of time, these randomly occurring storm disturbances result in a multi-aged mosaic of various stages of scrub succession. The oak canopy varies in height based largely on its proximity to the maritime influences of the Gulf of Mexico. Areas closer to the Gulf consist of a dense, nearly contiguous, salt pruned oak canopy. Oaks slightly farther away will be stunted in height, but no direct pruning is visible.

Scrub community should grade into beach dune and flatwoods communities without barriers such as roads, trails, etc. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* The park contains two variations of scrub, sand pine scrub and rosemary scrub. Rosemary scrub is found on the sandy ridges of old dunes adjacent to the beach dunes. Although hurricanes and salt spray have an

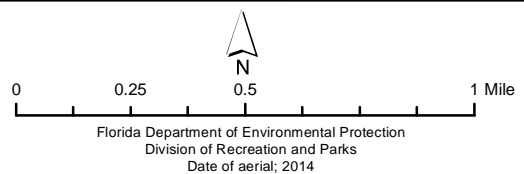


**Legend**

BD	- Beach Dune	161.10 ac.
CG	- Coastal Grassland	41.54 ac.
MAH	- Maritime Hammock	24.34 ac.
MF	- Mesic Flatwoods	233.65 ac.
SC	- Scrub	276.46 ac.
SCF	- Scrubby Flatwoods	3.17 ac.
WF	- Wet Flatwoods	27.31 ac.
BM	- Basin Marsh	90.82 ac.
CIS	- Coastal Interdunal Swale	11.94 ac.
SAM	- Salt Marsh	68.55 ac.
CDLK	- Coastal Dune Lake	6.91 ac.
ESGB	- Estuarine Seagrass Bed	1.01 ac.
EUS	- Estuarine Unconsolidated Substrate	24.83 ac.
MUS	- Marine Unconsolidated Substrate	119.55 ac.
CL	- Clearing	2.48 ac.
DV	- Developed	70.73 ac.

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ST. ANDREWS STATE PARK



NATURAL COMMUNITIES MAP



obvious and direct effect on this community, other processes that shape or maintain this community are unknown. This community is in good condition in the park.

The scrub community adjacent to the beach dunes is vital for the survival of the Choctawhatchee beach mouse. This community serves as a reservoir for food and cover for beach mice during and after catastrophic storms that may damage or destroy the primary dune systems. In general, the larger the contiguous area of habitat, the better survivability and habitat quality for beach mice. As with beach dune, the soils and vegetation are highly sensitive to, and are easily damaged by off road vehicle use and foot traffic. The Gulf coast solitary bee is present in patches of yellow buttons that occur in this community in addition to the adjacent beach dunes community.

The primary impacts to the scrub community at the park are unauthorized trails through the community. Trails are present impacting the scrub community near the campgrounds, on the road shoulders of the park drive on the mainland and near the jetties on Shell Island where park visitors cross the dune and rosemary scrub community to access the gulf. The beach dune and dune scrub communities are also impacted on the mainland along the shoulders of the park drive from park visitors parking or driving on the road shoulders.

*General management measures:* Visitor and management access to coastal scrub should be controlled through designated at-grade footpaths. Unauthorized paths or walkways through this community should be minimized as these paths serve as corridors that allow coastal winds and salt spray to penetrate into the scrub creating soil erosion and mortality of trees, thus further fragmenting this community. Additional accesses or development should avoid coastal scrub where possible to prevent impacts, and keep this community in good condition.

Exotic and nuisance animals should be controlled, including feral cats, coyotes, red foxes, and armadillos (*Dasypus novemcinctus*), to protect the population of beach mice. Exotic plants, including torpedograss and cogongrass, should be monitored and treated before establishing large stands within the park. The park drive currently acts as a corridor for exotic plants to enter this park.

The use of ignition techniques to mimic stand replacing or catastrophic canopy fires should not be applied to coastal scrub in the park since researchers (Drewa et al. 2008; Parker et al. 2001) have concluded that stand replacing fire was not the natural process driving coastal panhandle scrub communities. Use of stand replacing fire would not mimic a normal natural process in these communities, and it would expose the oak refugia that beach mice and other species use following tropical storms. Fire would only open this community up to abnormally high wind and water erosion, thereby creating larger gaps between the already fragmented coastal scrub along this well-developed coast.

## **WET FLATWOODS**

*Desired future condition:* At the park the desired future conditions of wet flatwoods should be represented by an overstory of scattered slash pine (*Pinus elliottii*) with a mixture of low shrubs and herbs in the groundcover. The canopy should be open, with widely scattered pines and of variable age classes. Sparse to no midstory should be present. Common shrubs should include fetterbush, titi (*Cliftonia monophylla*), saw palmetto (*Serenoa repens*) and wax myrtle (*Myrica cerifera*). Fire should burn through this community every two to four years. Soils should be saturated much of the year with little to no duff accumulation. The natural hydrology has been restored and is maintained.

*Description and assessment:* Most of the wet flatwoods are in fair ecological condition. At the park, the wet flatwoods community is located on both the mainland and Shell Island mixed within and around basin marsh habitat. The wet flatwoods patches are frequently found in linear strips situated at the ecotone between basin marshes and mesic flatwoods. Some older slash pine tree mortality has occurred due to the reintroduction of prescribed burns due to consumption of duff that has built up due to fire exclusion, primarily on Shell Island.

*General management measures:* Prescribed fire should be used to maintain this community. The fire return interval should range from two to four years. However, because this community is found in linear bands surrounded by a variety of non-fire type natural communities such as scrub, its fire return interval is likely a bit longer than what is typical. Duff should be assessed prior to burning, and duff moisture parameters and appropriate ignition techniques should be included in prescriptions to prevent mortality of trees and other species. Hydrological disruptions or alterations should be avoided. Historic fire plow scars should be mapped and assessed for restoration needs.

## **MESIC FLATWOODS**

*Desired future condition:* Mesic flatwoods are characterized by an open canopy of slash pines and a dense ground layer of low shrubs, grasses, and forbs. Saw palmetto will generally be present but not overly dominant. Shrub species include saw palmetto, gallberry (*Ilex glabra*), fetterbush, blueberry (*Vaccinium spp.*) and huckleberry (*Gaylussacia spp.*). Shrubs should be generally knee-high or less, and there should be few, if any, large trunks of saw palmetto along the ground. This fire-dependent community should be burned every 2-5 years. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* The mesic flatwoods areas at St. Andrews State Park are found in the ancient swale areas wedged between scrub ridges and are in fair condition. At the mid to lower portion of the slope, the scrub ridges grade into various flatwoods communities, including mesic flatwoods. The ecotone between these communities is extremely narrow, as the transition from one community to the next is very short. The undulating relief of the park, composed of ridges and swales, contributes to this mosaic of natural communities.



Based on the presence, relative abundance and distribution of key on-site plant species, the park's mesic flatwoods is considered to be in fair condition. Understory live fuel loading is still relatively high within some areas, due to previous fire exclusion. Where prescribed burning has been implemented, understory herbaceous plants have responded very well. With continued burning, proper species proportions will continue to improve.

Along the northern boundary of the park, the stormwater culverts coming from the adjacent development are directly flowing into and impacting the mesic flatwoods community. The stormwater flow is creating small streams flowing into a natural swale in the location. The flow of stormwater in the area, particularly following heavy rains, has led to alteration of the contours of the flatwoods and disruption of vegetation due to inundation. The stormwater has the capability of distributing exotic plant seeds and pollutants into the park.

*General management measures:* Prescribed fire is important to this community. Since this community is found on slopes in extremely narrow bands surrounded by a variety of non-fire type natural communities such as scrub, its fire return interval is probably a bit longer than what is typical.

The hydrology of this community is mostly intact. The park should continue to maintain the original hydrology and prevent future hydrological alteration. Care must be taken to prevent any further disruption to hydrology. Careful consideration should be given to the type, location, creation and maintenance of fire lines. The stormwater culverts coming from the neighboring development need to be evaluated to determine whether the flow of stormwater can be changed to lessen the impacts to the park.

### **SCRUBBY FLATWOODS**

*Desired future condition:* The dominant tree species of the interior of scrubby flatwoods should be slash pine (*Pinus elliottii*). There should be a diverse shrubby understory often with patches of bare white sand. A scrub-type oak "canopy" should contain a variety of oak age classes/heights across the landscape. Dominant shrubs should include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), saw palmetto (*Serenoa repens*), and rusty staggerbush (*Lyonia ferruginea*). Cover by herbaceous species should be low to moderately dense.

*Description and assessment:* This community is found in several areas of the park but mostly in the western side of the park. It is composed of a scattered slash pine overstory and an understory of mostly scrubby shrubs including myrtle oak, false rosemary, rusty lyonia and sand live oak. This community is in fair condition. The scrubby flatwoods located on Spanish Ante point (SA-O) has not been included in the prescribed fire program. However, the flatwoods did burn in association with a lightning fire. Many of the slash pine were killed by the wildfire. It is likely that these isolated flatwoods are maintained adequately through wildfire and tropical storm activity.

*General management measures:* Scrubby flatwoods should burn every 5 to 15 years. Prescribed fire is an important component of this community. Since this community is found on slopes in extremely narrow bands surrounded by a variety of non-fire type natural communities such as maritime hammock and salt marsh, its fire return interval is likely longer than typical.

## **BEACH DUNE**

*Desired future condition:* Desired future condition for the beach dune community at the park includes mounds and ridges of unconsolidated sediment formed by wind and high energy wave action. Dunes should occur in a series of ridges and swales paralleling the beach in a linear fashion and should be connected to various communities such as dune scrub or coastal grassland. The dune ridges should be interrupted periodically by blowouts. The accumulation of wrack (e.g., organic marine flotsam, including seaweed and driftwood) is crucial for dune formation. Wrack brought in by storm waves not only helps trap sand in place but adds nutrients to allow pioneer species to colonize the dune habitat. Vegetation on dunes should be patchy with lots of bare sand exposed and include a diversity and richness of plants such as sea oats (*Uniola paniculata*), seacoast marshelder (*Iva imbricata*), gulf coast bluestem (*Schizachyrium maritimum*), coastal sea rocket (*Cakile lanceolata*), railroad vine (*Ipomoea pes-caprae*), beach morning glory (*Ipomoea imperati*), saltmeadow cordgrass (*Spartina patens*), and bitter panicgrass (*Panicum amarum*). Rare plant species found in the beach dune community include Godfrey's goldenaster (*Chrysopsis godfreyi*), Cruise's goldenaster (*Chrysopsis gossypina cruiseana*). Occasional shrubs should be scattered within the herbaceous vegetation (depending on successional stage post-tropical storm), including Florida rosemary (*Ceratiola ericoides*), woody goldenrod (*Chrysoma pauciflosculosa*), coastal ground cherry (*Physalis angustifolia*), and sand live oak (*Quercus geminata*).

A self-sustaining population of Choctawhatchee beach mice (*Peromyscus polinotus allophrys*), a federally endangered species, should occupy all available beach dune habitats. Nesting shorebirds including least terns (*Sternula antillarum*), snowy plovers (*Charadrius nivosus*), Wilson's plover (*Charadrius wilsonia*), black skimmer (*Rynchops niger*), or eastern willet (*Tringa semipalmata semipalmata*), should successfully nest along the dune front in vegetation and/or shell debris, on the dunes or in dune blowout areas. Shorebirds should have connectivity between the beach dune community to various foraging habitats (such as the shoreline, tidal pools and/or the coastal dune lakes). In particular, corridors should be free from human disturbance, dogs and vehicle rutting during the breeding season to allow shorebirds (and their flightless young) to make the journey from the nest to available foraging habitats. Sea turtles should nest along a dark beach, and hatchlings should be able to crawl from the nest to the water on a beach that is free of vehicle ruts and artificial light. The Gulf coast solitary bee (*Hesperapis oraria*) should occupy the backside of the dunes and into the adjacent dune scrub community, primarily where yellow buttons (*Balduina angustifolia*) are found.

Wind and water shape this community. It is a dynamic system and should be constantly changing depending on timing and the stage of recovery after storm

impacts. Although this community type may burn, the fire return interval is unknown and there is a low likelihood that fire would be introduced from an adjacent natural community.

*Description and assessment:* The beach dune community is found on ridges running parallel and adjacent to the shoreline of the Gulf of Mexico. The beach dunes at the park had previously eroded significantly since Hurricane Opal in 1995. In particular, the beach dunes on Shell Island were significantly damaged from Opal due to overwash of the entire island. However, the dune system is recovering due to sand accretion and migration. Dune recovery was enhanced through a dune restoration project (i.e., sea oat plantings) in 2006. The planted sea oats have successfully trapped sand to create foredunes on Shell Island and the mainland. The vegetative cover of the dunes varies with some areas vegetated in a patchy distribution and others areas mostly vegetated. Vegetation on the primary dunes includes sea oats, seacoast marshelder, bluestem, sea rocket, and panic grass. Vegetation on the secondary dunes includes Florida rosemary, woody goldenrod, false rosemary, and sand live oak.

Despite erosion from storm activity, the dunes at the park are some of the best examples of undeveloped, intact dune habitat left in the state. The condition of beach dune community at the park ranges from fair to good. Specifically, the beach dune community on Shell Island is in good condition. The beach dune community on the mainland is fair condition due to more extensive dune erosion, greater visitor impact, and excessive beach driving. Tropical storms and human alteration are the biggest threats to beach dunes at the park. Storm surge from tropical storms or extreme high tides has eroded the primary dunes in places and has led to inundation of sea turtle and shorebird nests in low and/or narrow beach areas. Salt spray from tropical storms can impact dune vegetation by top-killing foliage and creating a moisture deficit that can desiccate plants. Recovery from tropical storms can be slow, with at least two years needed before vegetation is capable of producing seeds and additional years for some woody species to recover.

Visitors on Shell Island frequently access the beach by boat from the bayside and create informal trails through the dunes to access the Gulf beach. This has caused trampling of dune vegetation and dune erosion in various locations on Shell Island. When beach areas are not posted on the mainland, vehicles frequently drive close to the dune line, affecting dune plants and exacerbating dune erosion. The impact from vehicular traffic is typically greater following tropical storms or other disasters (e.g., oil spills) when vehicles are required along the shoreline for clean-up purposes. Excessive beach driving may prevent the establishment of dune vegetation, intensify beach erosion and create extensive ruts that are dangerous for shorebirds and sea turtles that utilize the habitat for breeding.

Subtle microhabitats occur within the beach dune at St. Andrews State Park. In a few remaining areas, wet swales creating small ephemeral pools fill with fresh water after significant rain events. Higher dunes not heavily impacted by past hurricanes succeed to coastal scrub with a variety of oak species (*Quercus* spp.) and Florida rosemary (*Ceratiola ericoides*). This matrix of beach dune, interdunal

swale, and scrub remains in constant flux at St. Andrews, changing slightly with every high energy storm event.

Many imperiled species rely on the beach dune natural community, including breeding shorebirds and seabirds, nesting sea turtles, and the Choctawhatchee beach mouse. Being one of the only undeveloped beaches on St. Andrew Bay, this park is vital to the existence and preservation of these imperiled animals. This community is the primary habitat of the Choctawhatchee beach mouse, which burrows in the dunes and forages at night for dune plants and insects. Maintaining the park's dune community in good condition is critical for sustaining this species. Currently, there are no beach mice on the mainland. However, maintaining the beach dune system is crucial for any future relocation efforts by beach mice populations to this area.

Exotic and nuisance predators including coyotes (*Canis latrans*) and cats (*Felis catus*) have been present at the park and can affect the rare faunal populations in the beach dune community. Additionally, nuisance predator species (e.g., raccoons, opossums, etc.) have also been reported at the park in high numbers and they have been documented predating shorebird nests throughout the park. Park staff work closely with USDA personnel to trap exotic and nuisance animals within the park prior to the shorebird and sea turtle nesting season, as well as throughout the season. Shorebird nesting at this park is severely limited due to the impacts from predators, as well as human interactions. The endemic beach mouse populations are also constantly threatened by these same predators, and would benefit from their removal.

"Sky glow" can be seen from the park, and artificial lighting impacts to the beach dune community are moderate on the mainland. Sea turtle disorientations from artificial lighting are a continuous threat to both nesting females and emerging hatchlings. The lights also impact the beach mice populations as well as nesting and resting shorebirds, by allowing predators more light to locate prey on the beaches. Recently, FWC has allotted funding to retrofit all lights surrounding the park to be "wildlife friendly," which should limit the impacts from artificial lights on all imperiled species utilizing the park.

*General management measures:* Park visitor access into and through beach dune areas should be controlled as much as possible to prevent degradation of the beach dune community at the park. Dune walkover areas should be designated and protected with boardwalks in the visitor use areas. Unauthorized trails in dunes should be actively discouraged with interpretive signs, ranger interpretation, post and rope, dune plantings and other natural barriers.

Driving on or near established dunes should be prohibited except through designated beach access areas. Beach driving by law enforcement, contractors, county officials, wildlife officials and assessment crews has increased since 2010 due to reconnaissance for oil from the Mississippi Canyon block 252 (also known as Deepwater Horizon) oil well blowout. Vehicular rutting associated with beach driving impacts shorebird and sea turtle hatchling nest success and recruitment. Beach

drivers should follow the guidelines in the FWC Best Management Practices for Operating Vehicles on the Beach (FWC BMPs) and try to keep from disturbing the wrack line. Symbolic fencing (i.e., posts, signs and rope) should be used to protect the beach dune habitat from potential detrimental impacts associated with beach driving. Moreover, efforts to protect the beach habitat should focus on protecting shorebird nesting habitat and dune restoration areas while creating a corridor for driving access as close to the wet sand as possible.

After tropical storms, impacts to dunes should be assessed. Plantings and other dune restoration techniques should be considered when and where necessary to prevent further dune erosion. A plan should be developed prior to any planting to address dune restoration while maintaining low vegetated dune blowouts for nesting shorebirds.

Exotic and nuisance predators should be controlled to prevent negative impacts to rare faunal populations, such as the Choctawhatchee beach mice, loggerhead sea turtles and snowy plovers. A tracking assessment of exotic predators should be conducted prior to the start of the shorebird nesting season and during beach mice and shorebird monitoring to establish predator control needs. Efforts to avoid and/or minimize disturbance, including the impacts associated with the presence of humans and dogs around nesting shorebirds, are critical to nesting success.

Artificial lighting or sky glow should not be present on the beach dune community. Artificial lights disorient sea turtles and can affect their ability to successfully enter the marine environment. Lights can also alter the behaviors of beach mice and nesting shorebirds. A nighttime assessment of lighting should be conducted annually before sea turtle and shorebird monitoring commences to anticipate and prevent sea turtle hatchling disorientations, and increased predator impacts.

To enhance the Choctawhatchee beach mouse population on the mainland, population augmentation is needed. Beach mouse augmentation is discussed in the Resource Management Program section of this component.

## **COASTAL GRASSLAND**

*Desired future condition:* Coastal grassland is a predominantly herbaceous community occupying the flatter and drier portions of the transition zone between the primary beach dunes and mesic flatwoods or coastal scrub. With the exception of overwash from severe storms, it is a relatively stable community compared to the dynamic primary dunes. Characteristic plant species include bluestem grasses (*Andropogon* spp. and *Schizachyrium scoparium*), camphorweed (*Heterotheca subaxillaris*) and earleaf greenbriar (*Smilax auriculata*). Other common species may include sea oats, bitter panicgrass and saltmeadow cordgrass (*Spartina patens*). Shorebirds species such as the Wilson's plover should nest along the edges of the coastal grasslands when adjacent to beach dunes or unconsolidated substrates. The Choctawhatchee beach mouse should foraging and nest within the coastal grasslands. Invertebrate species such as the Woodruff's polyphyllan scarab beetle and the Gulf coast solitary bee should be present.

*Description and assessment:* The coastal grassland patches are located in several large areas along the bayshore of Shell Island directly behind the beach dune habitat in SA-O. Small patches of coastal grassland habitat are also located along the bayshore near sandy point on the mainland (SA-L). As sand migrates from the Gulf, the grassland habitat formed in low areas that are periodically overwashed by storm surge. Panic grass and sea oats are some typical grasses found in this community. Since these areas are low, flat, and close to the Gulf of Mexico, many of these areas wash over during tropical storms, resetting the succession stage. A mosaic of various herbaceous plants and bare ground can be found depending on the time and impact of the last storm surge disturbance. When adjacent to beach dune habitat, these areas are important as foraging areas for beach mice and as nesting and foraging for shorebird species that utilize heavy vegetation for breeding such as Wilson's plovers and eastern willet.

The coastal grasslands are in good condition in the park. Much of Shell Island is accreting sand. Storm surge has not over washed the community since 2005, which has allowed the establishment of grassland vegetation in this area.

*General management measures:* This natural community is shaped by wind and water associated with tropical storms. The landscape is kept low and flat due to high water storm surges that push water from the Gulf of Mexico to St. Andrew Bay through these natural outlets. Vegetation is too low and sparse to carry fire through this natural community.

Park staff should work with volunteers to remove trash and debris from this community where hand removal is feasible. To avoid rutting and the creation of anthropogenic swales within the coastal grassland, vehicular traffic should be limited or excluded.

## **MARITIME HAMMOCK**

*Desired future condition:* Maritime hammock is a predominantly evergreen hardwood forest growing on stabilized coastal dunes lying at varying distances from the gulf shore. Tolerance to salt spray is the principal factor that controls vegetative cover in this community. Canopy species should consist of live oak (*Quercus virginiana*), sand live oak (*Quercus geminata*), red bay (*Persea borbonia*), and cabbage palm (*Sabal palmetto*). The canopy should be dense with large trees and often salt-spray pruned. The trees closest to the ocean are subject to onshore winds carrying sand and salt spray. The understory should be dense and the species should consist of yaupon holly (*Ilex vomitoria*), saw palmetto (*Serenoa repens*), and wax myrtle. Herbaceous groundcover should be very sparse. In maritime hammocks, insects, small mammals, reptiles and birds are numerous. Common inhabitants include wading birds such as great blue herons, great egrets, snowy egrets, little blue herons, tricolored herons, yellow-crowned night herons (*Nyctanassa violacea*), various warblers, and others. Raptors such as red-shouldered hawks (*Buteo lineatus*), Cooper's hawks (*Accipiter cooperii*), great horned owls (*Megascops asio*), and bald eagles (*Haliaeetus leucocephalus*), also utilize hammocks for feeding, roosting, and nesting. Reptiles include Florida softshelled turtles (*Apalone ferox*), Florida cottonmouths (*Agkistrodon piscivorus*

*conanti*), southern black racers (*Coluber constrictor priapus*), and gulf salt marsh snake (*Nerodia clarkii clarkii*), as well as a variety of skinks and lizards which prey on the abundant insect, frog, and small mammal population. Desired conditions include preventing accumulation of pollutants or manmade debris. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* This community is found on two isolated locations along the bay side of Shell Island (SA-N, SA-O) and on the mainland around Gator Lake (SA-J) and is in good condition. Due to the location between the bay and salt marsh habitat, fire is naturally rare. The bayshore adjacent to this habitat in unit SA-N is eroding. Tree stumps and roots can be found along the shore indicating the amount of erosion. The cultural sites found within this community are also eroding.

This community is heavily used during migration by various warbler species and other neotropical migrants. Migrating birds rely on this community as a stopover that provides food and shelter. Additionally, the large oaks provide roosts for owls and other raptors. Other avian species such as loggerhead shrike (*Lanius ludovicianus*) or American kestrel use the trees for perches for hunting over the adjacent salt marsh habitat. Wading birds use the adjacent salt marshes for foraging and will utilize the trees in this community for roosting.

*General management measures:* Fires are naturally rare due to surrounding habitats such as salt marsh and probably occurred infrequently on larger barrier islands. Fires may weaken the canopy trees making them more susceptible to damage by other coastal stresses, such as salt spray and storm winds. Care should be taken to avoid burning this habitat type when surrounding communities are burned.

The maritime hammock community is particularly sensitive to storm surge. In addition to physical destruction by storm waves, hammock trees are susceptible to being killed by standing salt water deposited in low areas by storm surge. Surveys of the impacts to the community are needed as the adjacent bayshore erodes. Habitat improvement measures along the bayshore may be needed in the future to prevent the loss of the community.

On Shell Island there is evidence of camping in the hammock habitat with the presence of fire pits, rope tied to trees, and tent stakes. This presence of camping in this habitat has the potential to transport invasive species from offsite wood and start fires from unauthorized campfires in a habitat that should not regularly burn. Enforcement and signage are needed.

## **BASIN MARSH**

*Desired future condition:* Basin marshes are regularly inundated freshwater herbaceous wetlands within a fire-maintained matrix community. This community is composed of emergent herbaceous and low shrub species that are dominant over most of the area with open vistas. Trees are few, and if present, occur scattered. There is little accumulation of dead grassy fuels due to frequent burning. When not inundated, the soil surface is often visible through the vegetation. Basin marshes

are dominated by Jamaica swamp sawgrass (*Cladium jamaicense*). Other emergent grasses and sedges are also present. Low shrub species such as wax myrtle (*Myrica cerifera*), groundsel tree (*Baccharis halimifolia*), and common buttonbush (*Cephalanthus occidentalis*) may be present along the perimeter; however, sedges and grasses will dominate the interior with an open vista. Other typical vegetation will include pickerelweed (*Pontederia cordata*) and bluetongue arrowheads (*Sagittaria lancifolia*). Basin marshes are an important breeding and foraging habitat for many marsh and wading bird species such as clapper rail (*Rallus longirostris*), least bittern (*Ixobrychus exilis*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), and tricolored heron (*Egretta tricolor*). In addition, basin marshes are important for various bat, amphibian, and reptile species, including the American alligator (*Alligator mississippiensis*). Although the marshes hold water year round, the emergent sawgrass will carry fire introduced from adjacent uplands. The optimal fire return interval for this community depends on fire frequency of adjacent communities. Basin marshes should be free from hydrological manipulations, chemical pollution, or man-made debris. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* There are basin marshes located at the park on the mainland and on Shell Island. The largest is located just west of the main park drive and known as Buttonbush Marsh (SA-C). The marshes contain spatterdock (*Nuphar advena*), arrowheads and yelloweyed grass (*Xyris spp.*) along the edges, and along shallow or emerged mud ridges within the marsh. Other segments of the marsh perimeter have a dense growth of shrubs that include common buttonbush, fetterbush (*Lyonia lucida*), wax myrtle, groundsel tree, dahoon (*Ilex cassine*), and dog fennel (*Eupatorium capillifolium*). The woody vegetation is heavily used as a rookery for wading bird species such as great blue heron (*Ardea herodias herodias*), great egret (*Ardea alba*), little blue heron, and snowy egret. The wading bird species forage along the shallows on fish and amphibians. The Buttonbush Marsh deepens in the center, near the established marsh overlook. Depending on the season, various waterfowl species use the deeper areas of the marsh such as American coot (*Fulica americana*), pied-billed grebe (*Podilymbus podiceps*), wood duck (*Aix sponsa*), blue-winged teal (*Anas discors*), and hooded merganser (*Lophodytes cucullatus*). Chinese tallow trees (*Sapium sebifera*) are also present in multiple locations through the basin marsh habitat on the mainland. In several of these locations, hundreds of trees occur.

The basin marshes at the park are in good condition. The hydrology remains intact, and burning has kept these communities in good condition. The Buttonbush Marsh retains water year-round except during severe droughts when the water table is low. There are various locations within the Buttonbush Marsh that receive very little fire due to year-round hydric conditions. Due to lack of fire in these locations, woody species are dense. The park road does bisect the Buttonbush Marsh on the mainland. However, there are culverts in place connecting Buttonbush Marsh and Gator Lake, allowing water flow. The culverts should be evaluated to ensure there is sufficient water flow.



On Shell Island, the basin marsh community extends from the coastal dune lake towards the bayside near the jetty. In recent years, the size of this community has shrunk due to the migration of sand and the associated increase in dune elevation in the area. The extent of basin marsh on Shell Island appears to be shaped by dune succession and tropical storm activity. Several smaller basin marshes are located on the bayside of the island mixed within flatwoods communities.

*General management measures:* Management measures for the park's basin marsh wetlands will include prescribed burning in association with fire return intervals of adjacent fire type communities. Additional focus will be on habitat and watershed protection. All exotics in the marsh should be documented and controlled as much as possible.

Currently, the wading bird rookery receives light disturbance. Disturbance levels should be assessed periodically to determine if management actions are needed. Additionally, periodic breeding surveys are needed and addressed in the Resource Management Program section of this component.

### **COASTAL INTERDUNAL SWALE**

*Desired future condition:* Coastal interdunal swale is a variable community which occurs as marshes, moist grasslands, dense shrublands, or damp flats. This community is created by the accretion of sediment leaving narrow strips of low-lying habitat between beach dune succession or from the deep scouring of sand as a result of storm surge associated with large hurricanes. Dominant plant species may be quite variable and a function of local hydrology, salt water occurrence, and the age of the swale. Wetter areas may include sawgrass, broadleaf cattail, bulltongue arrowhead (*Sagittaria lancifolia*) or American white waterlily (*Nymphaea odorata*), while shallower areas may have a diverse mixture of herbs, including Elliot's yelloweyed grass (*Xyris elliotii*) candyroot (*Polygala nana*), and saltmeadow cordgrass. Shrubby areas may contain wax myrtle (*Myrica cerifera*) and coastal plain willow (*Salix caroliniana*). Hurricanes and tropical storms can flood the swales with salt water after which they are recolonized with salt-tolerant species such as needle rush. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* Coastal interdunal swales are located adjacent to the Gulf of Mexico in addition to along the bayshore of Shell Island. Some have saltwater influence during storm surge events, and others are inundated periodically with freshwater. The size of the swales vary. However all are linear in shape and are found between dune ridges. The swales closest to the coast are dominated by smooth cordgrass and sedges. The swales further inland are dominated by sawgrass and spikerush (*Eleocharis spp.*). The coastal interdunal swales at this park are in good condition. The hydrology remains intact and annual storm surge serves to keep these swales herbaceous. Fire can burn in these swales if the adjacent habitat also burns. Since many of these swales are located within the dunes and dune scrub habitat, beach mice and shorebirds utilize the edges of the swales. This community can be an important foraging area for shorebird broods, particularly during early successional formation and when located adjacent

to nesting habitat (e.g., beach dunes, marine unconsolidated substrate, etc.). Shorebirds and beach mice forage in this community because the wet or damp soils attract a range of invertebrates. In addition, the associated vegetation may provide an important protected corridor by providing vegetative cover from predators for beach mice and shorebirds while traversing between habitat patches.

*General management measures:* Due to the accumulation of freshwater, swales are an ideal community for exotic plants to become established. It is vital that park staff survey for invasive exotics such as cogongrass and Chinese tallow tree in these wetter, more favorable communities on Shell Island.

If these swales are located within a matrix of other pyric communities, fire should be allowed to burn through the swales when conditions were favorable. Point source ignition would not be an applicable tool for managing this community. Wind and water associated with high energy storm events are the main disturbance factors for this natural community.

## **SALT MARSH**

*Desired future condition:* Salt marsh is a largely herbaceous community that occurs in the portion of the coastal zone affected by tides and seawater and protected from large waves. Salt marsh typically will have distinct zones of vegetation based on water depth and tidal fluctuations. Saltmarsh cordgrass will dominate the seaward edge -- areas most frequently inundated by tides. Needle rush will dominate the higher, less frequently flooded areas. Other characteristic species include annual saltmarsh aster (*Symphyotrichum subulatum*), saltwort (*Batis maritima*), sea oxeye (*Borrchia frutescens*), and shoreline seapurslane (*Sesuvium portulacastrum*). A landward border of salt-tolerant shrubs including groundsel tree (*Baccharis halimifolia*), yaupon holly (*Ilex vomitoria*), and marshelder (*Iva frutescens*) may exist. Soil salinity and flooding are the two major environmental factors that influence salt marsh vegetation. Soils range from saturated to inundated and vary considerably from deep mucks to fine sands but always contain a high salt content, limiting plant species diversity. Fire may sporadically burn into the salt marsh from surrounding communities, though this would likely be very limited in extent given the patchiness of the fuels and the wetter areas interspersed among the drier zones.

Hydrology should remain unaltered and tidal exchange uninfluenced by development. Snakes such as the gulf salt marsh snake and other herptofauna should be present. The salt marsh should be used by a variety of birds for foraging, resting and nesting, including clapper rails, least bitterns, reddish egrets (*Egretta rufescens*) or seaside sparrows (*Ammodramus maritimus*). Invertebrates such as marsh periwinkles (*Littoraria irrorata*) and salt marsh tiger beetles (*Habroscelimorpha severa*) are an important component of salt marshes and should be present. Fiddler crabs should be present along the edges of the salt marsh community. Desired conditions include preventing accumulation of pollutants or manmade debris. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* This community is found along the bay side of Shell Island over much of the length of the island, and it is in good condition along the edges SA-N and SA-O. Needle rush and sawgrass dominate these communities. The salt marsh community on Shell Island was previously more extensive following the hurricane activities of 2004 and 2005 due to an influx of saltwater and overwash throughout the island. Many of these areas are now beach dune or coastal grassland habitat due to sand migration and the subsequent increase in beach elevation that no longer succumbs to tidal inundation.

Numerous wading birds utilize the salt marsh habitat including snowy egrets, reddish egrets, little blue herons and tricolored herons. A variety of bird species use the salt marsh habitat for nesting including clapper rail, sora (*Porzana carolina*), least bittern, and marsh wren (*Cistothorus palustris*). Seaside sparrow and Nelson's sharp-tailed sparrow (*Ammodramus nelsoni*) are found in the Shell Island salt marsh habitat during the winter months.

*General management measures:* Following storm events, the salt marsh habitat is often littered with garbage. These materials should be collected and removed when possible due to potential for entanglement or ingestion by foraging wading birds and other wildlife.

Although this community can potentially burn, the fire return interval is unknown, but it would likely burn with adjacent communities, such as mesic flatwoods. The main ecological factor driving this community appears to be wind and waves from the Gulf of Mexico and St. Andrew Bay. The vegetative biomass and diversity in these salt marshes fluctuates from halophytic after extreme high water events and tropical storms that impact the park to fresh during periods of low tropical storm activity and heavy rains. Fire should be used with caution in the marsh to avoid adversely affecting bird or other species dependent on the marsh habitat for nesting and foraging. Specifically, fires during the breeding season should be ignited in a mosaic providing patches of unburned habitat that function as a refuge for marsh dependent species.

## **COASTAL DUNE LAKE**

*Desired future condition:* The desired future condition of a coastal dune lake is a shallow freshwater lake occurring in the coastal community. Coastal dune lakes develop from various coastal processes. They most commonly begin as a tidally influenced basin or lagoon that becomes closed by sand filling its inlet. Coastal dune lakes are typically still waterbodies without significant surface inflows or outflows but may be periodically connected to the Gulf of Mexico. The water is largely derived from lateral ground water seepage through the surrounding well-drained coastal sands. The shoreline and immediate watershed are largely undeveloped, protecting natural hydrological process. Storms occasionally provide large inputs of salt water resulting in variable salinity levels over the long term. Coastal dune lakes should be oligotrophic with low nutrients and a mostly sand bottom.

The shoreline of the park transitions into various natural communities. Many areas are open and sandy, while others are vegetated with herbaceous and shrubby

wetland plant species. Vegetation may be largely restricted to a narrow band along the shore or a dense shrub thicket, depending on fire frequency and/or water fluctuations. Shallow, gradually sloping shorelines may have much broader bands of emergent vegetation with submersed aquatic plants occasionally dominating much of the surface. Depending on the salinity level, common plants include rushes (*Juncus spp.*), sedges (*Cyperus spp.*), cattail, sawgrass, seacoast marshelder, and groundsel tree. Coastal dune lakes are important breeding areas for many insects that form the base of numerous food chains. A variety of wildlife species inhabit the coastal dune lakes depending on the season. As a source of fresh water, the lakes are important watering holes for mammals and birds inhabiting the surrounding coastal communities. American alligator are frequently present due the presence of freshwater. Wading birds such as little blue heron, green heron, or reddish egrets utilize the coastal dunes lakes for foraging or nesting. During the winter months, waterfowl species such as American coot, ruddy ducks (*Oxyura jamaicensis*), blue wing teal and northern pintail (*Anas acuta*) use the lake for roosting and foraging. Snowy plovers, Wilson's plovers, and least terns frequently select beach dune nesting habitat directly adjacent to the coastal dune lakes in order to nest in close proximity to high quality foraging habitat for their chicks. Snowy plover bring their chicks to the wet sand edges to feed and least terns feed regularly in the coastal dune lakes to bring small fish back to their chicks. If the edges of the lake are open, sandy and wet, migratory shorebirds such as piping plover can be found foraging. Coastal dune lakes should not be hydrologically altered and should remain free of chemical pollution or litter.

*Description and assessment:* One coastal dune lake is present at the park. The unnamed lake is located on Shell Island (SA-N) and is in excellent condition. This is the only permanent source of fresh water on the island. There are no hydrological alterations or development that impact the lake. Although the lake is often sought out by park visitors, the lake receives only a moderate amount of impacts due to its relatively remote location on the island.

The unnamed lake and its associated basin marsh form a gently sloping, shallow, elliptic freshwater basin bordered by scrub and beach dune. Two dune blowouts from prior hurricane activity exist adjacent to the lake on the southeast end. These blowout areas provide a significant nesting area at the park and supports nesting least terns, snowy plovers and Wilson's plovers annually.

Vegetation is limited to the shallower waters around the perimeter and consists almost exclusively of floating emergents. Fragrant water lily is dominant, however floating hearts and spatterdock can also be found. Shoreline vegetation includes sawgrass, cattail, saltbush, saltmeadow cordgrass, and needlerush (*Juncus roemerianus*).

*General management measures:* Management measures for the unnamed coastal dune lake and surrounding habitat within the park will focus on protection of these rare aquatic habitats as well as the immediate watershed, in order to preserve natural hydrological process, to the extent feasible. After tropical storms, non-organic, non-biodegradable litter should be cleaned from the community.

Because the coastal dune lake is an important component for nesting, foraging, migrating, and wintering shorebirds, protecting portions of the lake edge with symbolic fencing for shorebirds may be necessary during busy months of the year, particularly in areas near the dune blowouts that occur at the southeast end of the lake.

### **MARINE UNCONSOLIDATED SUBSTRATE**

*Desired future condition:* Marine unconsolidated substrate is a dynamic system that consists of expansive unvegetated, open areas of white sandy beaches with shell and other organic debris. The backshore should be dry except during storm surge conditions when high water and large waves push water and sediment over the upper part of the beach. The surface of the backshore should be covered with ripples and hummocks formed by wind and with a surface layer of shells and other debris transported by wave action. Due to continual sediment reworking by wind, high energy waves, and tides, this community is highly dynamic. Seasonally sediment is removed from the beach during storms and accretes during periods of calm weather when onshore winds and currents are present. Ephemeral tidal pools should form as sand accretion connects nearshore sand bars to the barrier beach front or from dips in the sand created from overwash and wave action. The lower or wet portion of the beach should contain a high density of infauna and pelagic organisms that support a variety of foraging shorebirds. Coquina (*Donax spp.*), mole crabs (*Emerita spp.*), ghost shrimp (*Callinassa biformis*), and polychaete worms (*Nephtys bucera*) should also be present along the swash zone. Organic marine flotsam, including seaweed and driftwood, should form a wrack line on the beach. Abundant ghost crabs should be present throughout this community. Tiger beetles (*Cicindela sp.*) should be present in the dry sand during the larval stage and along the swash zone as adults. Nesting shorebirds such as snowy plover, Wilson's plover, least tern, and black skimmer should nest in the upper portion of the beach without disturbance. Foraging shorebird broods (i.e., flightless chicks) and migratory shorebird species (e.g., piping plover, red knots, etc.) should forage on the wet sand without disturbance. Sea turtles should use the gulf-side beach for nesting. Presence of exotic plants and animals should be minimal and under control. Sparse vegetation may be colonizing on the upper beach depending on the amount of time since the last tropical storm. Desired conditions entail minimal soil compaction, dredging activities, vehicle rutting, and disturbances such as the accumulation of pollutants or manmade debris.

*Description and assessment:* This natural community extends from the low tide line along the Gulf shore landward across the sparsely vegetated sediment to the primary dune where it merges with the beach dune community along the entire length of the Gulf beach of the mainland and Shell Island. This community is in good condition on Shell Island and in fair condition on the mainland. Erosion is the biggest factor changing the shoreline at this park. In addition to erosion, high visitor impact and heavy beach driving impact this community on the mainland. Beach raking does not occur at the park; therefore, the natural beach wrack community is kept intact. This community is extremely important to many designated species such as nesting sea turtles and shorebirds. Shorebirds use these

areas for foraging, loafing and resting. Vehicles are used on the beaches for sea turtle, shorebird and beach mice surveys, but driving is limited to those lower beach areas not utilized for nesting.

The Gulf shoreline at the park's mainland beaches is heavily eroding. The section of shoreline along the St. Andrew channel in front of Gator Lake has been identified as critically eroding (FDEP 2010). Dredging of the St. Andrew channel and subsequent placement of the dredge spoil material is the primary means preventing further loss of the adjacent habitats, including Gator Lake, the beach dunes, and the dune scrub along the channel.

*General management measures:* Natural beach erosion and accretion occurs constantly within this community. Park staff should monitor changes in the beach community but limit the amount of human interference in the form of beach nourishment or hard stabilizations if possible.

Manmade non-organic, non-biodegradable debris should be cleaned off the beach as much as feasible after tropical storms. Wrack lines with natural materials should not be moved or destroyed. A healthy wrack line on the wet beach is important for supporting macroinvertebrates, as well as providing shorebirds valuable foraging areas. As high tides move wrack up to the dry sandy beach, it can then serve to trap sand and support colonizing dune vegetation.

Vehicular driving should be discouraged as it creates rutting and can affect infaunal populations. Rutting can cause a barrier to sea turtle hatchlings as they crawl to the Gulf after hatching. Driving on the beach can also disturb nesting, resting and foraging shorebirds. Shorebird chicks are very vulnerable to predation, especially from ghost crabs or gulls, when trapped in ruts. Also, newly hatched chicks tend to squat in vehicle ruts to hide from an oncoming vehicle and may be run over.

Beach driving by law enforcement, contractors, county officials, wildlife officials and assessment crews has increased since 2010 due to reconnaissance for oil from the Mississippi Canyon block 252 oil well blowout. Vehicular rutting associated with beach driving impacts shorebird and sea turtle nest success and recruitment. Beach drivers should follow the guidelines in the FWC Best Management Practices for Operating Vehicles on the Beach (FWC BMPs) and try to keep from disturbing the wrack line. Symbolic fencing (i.e., posts, signs, and rope) should be used to protect the beach dune habitat from potential detrimental impacts associated with beach driving. Moreover, efforts to protect the beach habitat should focus on protecting shorebird nesting habitat and dune restoration areas while creating a corridor for driving access as close to the wet sand as possible.

Exotic and nuisance predators should be controlled to prevent negative impacts to rare faunal populations, such as Choctawhatchee beach mice, Loggerhead sea turtles and snowy plovers. A tracking assessment of predators should be conducted prior to the start of the shorebird nesting season and during beach mice and shorebird monitoring to establish predator control needs. Efforts to avoid and/or

minimize disturbance, including the impacts associated with the presence of humans and dogs, around nesting shorebirds is critical to nesting success.

Artificial lighting or sky glow should not be present on the beach. Artificial lights disorient sea turtles and can affect their ability to successfully enter the marine environment. A nighttime assessment of lighting should be conducted annually before sea turtle monitoring commences to anticipate and prevent sea turtle hatchling disorientations.

### **ESTUARINE UNCONSOLIDATED SUBSTRATE**

*Desired future condition:* Estuarine unconsolidated substrates are generally characterized as low energy, relatively open areas of subtidal, intertidal, and supratidal zones which consist of expansive unvegetated areas composed of shell, mud, and/or sand. This natural community extends itself from the low tide line along the bayshore landward across the sparsely vegetated sediment to where it grades into adjacent communities. Sparse vegetation may be colonizing at the edges of this community depending on the amount of time since the last tropical storm. The vegetation type depends on the adjacent community and the level of salt water overwash. Common plant species include American glasswort (*Salicornia virginica*), sea oats, and black rush. At low tide, much of the shoreline should consist of tidal flats of exposed sand and mud. This community should support a large population of infaunal organisms as well as a variety of transient planktonic and pelagic organisms (e.g., tube worms, sand dollars, mollusks, isopods, amphipods, burrowing shrimp, and an assortment of crabs) and should support a variety of foraging wading birds and shorebirds. When tidal flats are exposed during low winter tides, this habitat is heavily used by many migratory shorebirds such as piping plover and red knots. This community on Shell Island is designated as critical habitat for piping plovers. Ghost crabs (*Ocypode quadrata*) are abundant in this community. Although ghost crabs need dry sand for their burrows, they are frequently observed on the wet tidal areas foraging and require the moisture from this community to survive. Fiddler crabs (*Uca* spp.) are seasonally common along the wet exposed sand at low tide. Organic marine debris, including seaweed and driftwood, should form a wrack line on the shore. The desired future condition of this community for the park is a dynamic system free of pollutants, manmade debris, vehicular rutting, and dredging. Presence of exotic plants and animals should be minimal and under control.

*Description and assessment:* This natural community extends from the low tide line along the bay shoreline landward. This community grades into seagrass beds and salt marsh habitat in some locations. At the park some areas of the bayshore are eroding and others are accreting. The erosion threatens many cultural sites located on the bay shoreline. In the eroding areas, exposed roots can be found along the bayshore at low tide indicating the amount of erosion. Other eroding areas on Shell Island are converting into salt marsh habitat due to lower elevations and the resulting salt water intrusion. On the mainland, the eroding bayshore is impacting the campground. Much of the remaining bayshore is accreting sediment from the beaches and dunes as the sand migrates to the backside of the island. Most of the accreting locations are observed at washover areas. Due to periodic overwash from

ocean waves over the island during storm events, sand is deposited behind the bayside dunes. In addition, changes in currents and water flow associated with the creation and continued dredging of the St. Andrew channel may also influence the forming sediments on the bayshore. Accretion has resulted in formation of extensive tidal flats along segments of the bay.

Wider beach areas along the bayshore and exposed tidal flats are utilized by foraging shorebirds. In particular, areas with open access from the beach dune habitat or marine unconsolidated habitat are important foraging areas for shorebird broods (i.e., with flightless young) at low tides.

*General management measures:* Natural beach erosion and accretion occurs constantly within this community. Park staff should monitor changes in the beach community. The bayshore adjacent to the campground on the mainland should be evaluated for potential shoreline restoration. The bay shoreline may need to be bolstered with breakwaters, riprap, or a living shoreline to reduce and minimize further erosion.

Manmade non-biodegradable debris should be cleaned off the bayshore as much as is feasible after tropical storms or extreme high tide events. Wrack lines should not be moved or destroyed. A healthy wrack line on the wet bayshore is important for supporting macroinvertebrates. Birds and other fauna forage in the wrack line as well as in the wet shoreline. As high tides move wrack up to the dry sandy shore, it can then serve to trap sand and support colonizing vegetation. Disturbance to foraging, wading, and nesting birds should be avoided along the bayshore.

Boaters predominantly land on the bayside to access Shell Island. Currently, no signs are posted on the bayside indicating the park boundary or recreational access points due to prior storm damage. Signage should be reestablished and should be placed throughout Shell Island and indicate established access points, interpret the importance of wildlife needs to boaters, and interpret park regulations (such as those that prohibit dogs and camping).

## **SEAGRASS BEDS**

*Desired future condition:* Marine seagrass beds are characterized as expansive stands of vascular plants and are among the most productive communities in the world. Seagrass beds will occur in clear, coastal waters where wave action is moderate. The three most common species of seagrasses in Florida are turtle grass, (*Thalassia testudinum*), manatee grass, (*Syringodium filiforme*), and shoalweed (*Halodule wrightii*). Other seagrasses of the genus *Halophila* may also occur but will be considerably less common. Seagrass beds require unconsolidated substrate in order to establish their underground biomass root structure. They will typically be found in waters ranging from 20° to 30°C (68° to 86°F), and require clear water for photosynthesis. Seagrass beds will not thrive where nutrient levels are high because of increased turbidity and competition of undesirable algal species. This community supports a high diversity of marine species. Seagrass beds should be free from pollutants, development, man-made debris, dredging activities, and boat damage.



*Description and assessment:* This community is located along the bay shoreline of the park and is designated as part of the St. Andrews Aquatic Preserve. Only a small area of seagrass bed is located inside a bayside cove within the park boundary. The remainder of this community type is located adjacent to the park boundary. The St Andrew Bay ecosystem supports a large diversity of species, over 3,600 including some endemic to the area making it perhaps one of the most diverse estuarine systems in North America (Keppner and Keppner 2001). Three species of seagrass are found in St. Andrew Bay: turtlegrass, shoal grass and manatee grass. Turtlegrass is the dominant seagrass species and provides the most habitat in St. Andrew Bay. This subtidal species grows to depths of 1.8 to 2.4 meters. There are also extensive beds of manateegrass and shoalgrass. Manateegrass is found within turtlegrass beds or less often in pure stands near the influence of clear, highly saline water entering the bay from the Gulf. Shoal grass is a pioneer species that dominates the shallow and intertidal bay areas. These beds can be exposed to the air in winter when north winds push large amounts of water from the bay and in spring when north winds combine with low spring tides.

The seagrass beds support a diverse assemblage of fish populations including mullet, pinfish, needlefish, mojarra, seahorses, pipefish, blennies and gobies as well as the young of many commercially and recreationally important species. Imperiled species such as loggerhead, green, leatherback and Kemp's ridley sea turtles and the West Indian manatee (*Trichechus manatus*) use seagrass beds for foraging and cover. However, the manatee is uncommon in the St. Andrew Bay and is likely not found within the narrow strip of seagrass beds that fall within the park boundary.

St. Andrew Bay is popularly used by recreational boaters. In addition, Shell Island is a popular destination for locals and visitors in Panama City. Frequent occurrence of boats in the shallows along the bay of the park has led to physical damage of the seagrass beds from boat propellers, often referred to as "prop scars", which require years to recover.

Water quality or nutrient loading can impact the seagrass bed community. Currently the St. Andrews Aquatic Preserve maintains relatively clear waters. Several factors contribute to the bay's clarity including the spring fed tributaries, the lack of silt-clay soils in the area and the healthy salt marshes and seagrass beds that help filter the bay by stabilizing sediments. The resulting low sediment loading in St. Andrew Bay supports extensive seagrass beds. However, water quality is increasingly an issue in the bay as sources of nutrient loading from wastewater treatment facilities, septic systems or stormwater runoff impact the bay and therefore the seagrass community within the park.

*General management measures:* To help minimize the occurrence of prop scars and aid in the recovery of seagrass beds at the park, education and outreach efforts to the boating community on the impacts of propeller scarring should continue. The park should continue working with federal, state, and local partners, including Gulf Coast State College and the USFWS, to continue the education and outreach effort. The outreach program was a collaborative effort between 2005 and 2007. The

outreach program sought to hand out stickers, pamphlets and conducted education workshops throughout the community. The knowledge base of recreational boaters increased following the outreach program. The study found that boater education combined with markers delineating shallow water where seagrass is found was effective in preventing an increase in propeller scarring from boaters (Spector unpublished). Seagrass monitoring transects were conducted in the area and should be repeated to evaluate this program.

During the 2005-2007 study, shallow water areas, where seagrass beds are vulnerable, were delineated with buoys indicating the shallow water area. Similar signage should be established along the bay to indicate designated boat access locations along Shell Island. Designating access points will reduce damage to seagrass beds to occurring at fewer locations. As with any signs placed in a coastal environment, they will have to be maintained following storms, normal wear from the elements, or vandalism, in collaboration with the St. Andrews Aquatic Preserve.

Currently various partners throughout St. Andrew Bay collaborate to monitor the water quality. Collaborating entities include Friends of St. Andrew Bay, Gulf Coast State College, and the St. Andrew Bay Resource Management Association. The park should work directly with these entities and the St. Andrews Aquatic Preserve as partners to develop management and monitoring recommendations within the seagrass community that falls within the park boundaries.

## **DEVELOPED**

*Desired future condition:* The developed areas within the park will be managed to minimize the effect of the developed areas on adjacent natural areas. Priority invasive plant species (FLEPPC Category I and II species) will be removed from all developed areas. Other management measures include proper stormwater management and development guidelines that are compatible with prescribed fire management in adjacent natural areas. Presence of exotic animals should be minimal and under control.

*Description and assessment:* Developed areas include parking areas, buildings, campgrounds and other facilities as well as maintained rights-of-way and roadsides. Currently vehicles using the main park road are impacting the beach dune and scrub communities along the roadsides, thereby increasing the footprint of the road at the park. Proper signage and enforcement are needed to minimize and prevent further degradation of the area.

Many of the exotic plants present at the park have been observed in developed areas around park buildings, including residences. The campground and park buildings are periodically infested with rats, both black (*Rattus rattus*) and Norway (*Rattus norvegicus*). In addition to rats, the garbage and fish waste left at the jetties have led to a habituated population of raccoons. Park visitors are regularly observed feeding and approaching the raccoons.

*General management measures:* Staff will continue to control invasive exotic plants in developed areas of the park. Defensible space will be maintained around all structures in areas managed with prescribed fire or at risk of wildfires. Trapping

efforts are clearly needed for rats and raccoons. However, efforts to educate visitors on proper waste disposal and food storage are needed. Using facilities that prevent rats from accessing waste will also help reduce the rat problem. Additionally, signage and enforcement are needed near the jetties to minimize the occurrence of visitors feeding the raccoons and other wildlife.

## **CLEARING**

*Desired future condition:* The clearing areas within the park will be managed to remove priority invasive plant species (FLEPPC Category I and II species). Other management measures include limited restoration efforts designed to minimize the effect of the ruderal areas on adjacent natural areas. Cost-effectiveness, return on investment and consideration of other higher priority restoration projects within the park will determine the extent of restoration measures in cleared areas.

*Description and assessment:* The cleared areas at the park are predominately located along the park roads, parking areas and park boundaries and tend to have a higher occurrence of exotic plants. In particular the cleared areas along the northern boundary are prone to exotic plant infestations.

Additional cleared areas occur along the edges of the main park drive, near the overflow parking lot and near the district office in locations of recent construction activity associated with pipe replacement.

*General management measures:* Staff will continue to control invasive exotic plants in ruderal areas of the park as needed.

## **Imperiled Species**

Imperiled species are those that are (1) tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2); or (2) listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC) or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

The Choctawhatchee beach mouse is listed as endangered by the USFWS and the FWC, and the USFWS has designated portions of the park as Critical Habitat for the Choctawhatchee beach mouse. Habitat loss all along its former range is the major contributing factor to the decline of this sub-species. Other threats include further development, hurricanes, introduction of competitors such as house mice and exotic predators such as coyotes and feral cats. The park should continue tracking surveys in conjunction with FWC to document presence and distribution of mice. In addition, tracking surveys help to alert management to the presence of non-native predators or other threats. Predator control is very important to maintain the population of beach mice. Although there is a healthy beach mice population on Shell Island, no beach mice are present on the mainland of the park. Over the past year beach mice were present in 70-80% of the tracking tubes on Shell Island. Although tubes were not placed on the mainland in 2012, during past surveys mice were present at 0% of all tubes. The mainland is considered beach mouse Critical

Habitat by the USFWS although they do not currently occur in this location. Associated with this designation is the goal to reestablish Choctawhatchee beach mice at additional sites throughout their historic range and help buffer the species against catastrophic events, thereby helping achieve long-term recovery goals. The specific goals of the agreement are: (1) establish new populations of Choctawhatchee beach mice at state parks where they do not currently exist in the wild; (2) increase the current range of Choctawhatchee beach mouse, thereby helping to protect against catastrophic loss of the species; (3) provide an opportunity to increase genetic diversity in the species; (4) potentially increase the number of Choctawhatchee beach mice in the wild; and (5) provide an additional source of Choctawhatchee beach mice for future management activities, if warranted.

Federally-listed loggerhead and leatherback sea turtles nest on the open sandy beaches and in the beach dunes at the park. Annual sea turtle nesting is low at the park and ranges from 1-21 nests. Since 1996, St. Andrews State Park has had an average of 10.8 loggerhead nests per season. Loggerheads are the primary nesting sea turtle species. Leatherback sea turtles make nesting attempts every few years. Green and Kemp's ridley sea turtles are in the surrounding area and nest at adjacent sites; however, they have not been documented nesting at the park. In accordance with FWC protocol, park staff and trained park volunteers survey the full length of the beach daily, identifying new nests, locating eggs, and erecting boundary postings with signage. Nests are excavated after either hatching occurs or 70 days have elapsed from when eggs were deposited. All nests are documented and recorded, including those lost to erosion or predation.

"Sky glow" can be seen from the park, particularly on the mainland, but disorientation events are rare. From 2006 to 2012, there were 7 sea turtle disorientations from artificial lighting on Shell Island and the mainland, and none have been reported for the past two years. Five of the 7 disorientations occurred on Shell Island in 2006 following the hurricanes of 2004-2005. The erosions of the primary dunes from storm activity likely increased the amount of sky glow observed from the island. Disorientations on the mainland were observed in 2009 from nests located near the western park boundary, and hatchlings were observed moving towards the neighboring development. All exterior lighting should be "wildlife friendly" lighting and conform to the FWC Marine Turtle Lighting Guidelines. All incidents of any improper lighting for housing developments to the west and east of St. Andrews State Park will be reported to the proper departments within FWC.

Nesting shorebirds are also monitored weekly at St. Andrews State Park during the nesting season (February 15 – September 1), and normally include snowy plovers, Wilson's plovers, least terns, and black skimmers. Other imperiled species such as American oystercatchers (*Haematopus palliatus*) utilize this park for foraging and loafing sporadically, but have not nested within the park boundary in recent history. State-listed snowy plovers, least terns and black skimmer also nest in the beach dune community within the park. On Shell Island, annual nesting for snowy plovers ranges from 30-40 nests; for least terns, nesting ranges from 30-80 nests depending on the season; for black skimmers, nesting ranges from 0-10 nests per

season. Wilson's plovers are not state-listed but are also found on Shell Island, with nesting ranging from 5 to 10 nests. On the mainland, annual nesting for snowy plovers ranges from 1 to 10 nests. For least terns, nesting ranges from 1-10 nests on the mainland, depending on the season. Black skimmers have exhibited pre-nesting behavior on the mainland, but no nests have been documented to date. Fledgling success is generally low on Shell Island due to high predation and disturbance impacts from park visitors and recurrence of dogs on the beach. Coyotes are a severe threat to successful shorebird nesting at the park. In addition to coyote, nests are commonly depredated by ghost crabs, raccoons, Virginia opossum, and fish crows.

For snowy plovers and Wilson's plover using the park, efforts are made to color band adults and chicks. Bands are used in the short term to monitor productivity and establish local population abundance. Over the long term, banding is used for survival analysis. For example, the world's oldest known snowy plover in the state of Florida nests on Shell Island (state park and Tyndall sections) and was banded as a chick in 1998 at Grayton Beach State Park. For the banding program, emphasis is placed on the chicks because doing so establishes known-age cohorts. At this park, banding efforts for snowy plovers began in 2008 and in 2012 for Wilson's plover. All banding efforts are in collaboration with DRP biologists, FWC, USFWS, Audubon Florida, and the University of Florida.

Areas throughout the park are to be posted for nesting and resting birds. Timing, size, and enforcement of area closures for beach nesting and resting shorebirds and sea turtles are critical to their effectiveness. Posting of significant wildlife habitat in advance of seasonal occupation (pre-posting) can make the difference between occupied and unused nesting sites. Providing a sufficient buffer to ensure that disturbances do not result in abandonment is critical. In areas of intense recreational pressure, outreach and enforcement need to accompany any posting effort. The DRP will continue to coordinate with FWC on enforcement and protection measures for critical shorebird and sea turtle nesting and resting areas.

The DRP will seek a balanced approach to minimize visitor impacts to shorebirds and the park's sensitive coastal habitats, while managing resource-based recreational activities. In collaboration with FWC, other government agencies, local non-governmental organizations, and park staff will identify and delineate habitats and educate the public about shorebird protection. Management decisions will be informed by analysis of data on habitat use in the park during prior nesting seasons. This analysis will suggest areas of importance where focused management actions are needed. These actions will typically include:

- Demarcating potential shorebird habitat by enclosing the perimeter of the habitat and buffer area with appropriate fencing and signage using guidelines from the Florida Shorebird Alliance (Avisar et al. 2012).
- Encouraging and focusing visitor activities into areas less suitable for shorebird nesting habitat.
- Monitoring during nesting season to identify and protect new breeding sites.

- Providing interpretive and educational outreach to the public prior to and during the nesting season to encourage visitor use that protects shorebirds and their habitat.
- When the same breeding sites are used year after year, posting the protected area will occur prior to the season (pre-posting).
- When new breeding sites are indicated, appropriate measures will be implemented, including demarcating new protected areas and expanding or initiating interpretive programs.
- Coordinating with FWC and local law enforcement agencies to ensure compliance with park rules and shorebird protection, as needed.

When it is necessary to limit recreational activities or visitor access to protect nesting habitat, park staff or volunteers will provide onsite interpretation to educate visitors about the management of imperiled shorebird habitat and identify suitable recreational areas. Pre-posting the identified habitat areas combined with early public notification regarding the park's shorebird protection program will improve visitor compliance with park rules and promote broad-based public stewardship of shorebird nesting, resting, and foraging habitats in the park. For more information and details of monitoring protocols, please visit DRP's shorebird and seabird management plan.

St. Andrews State Park is also utilized for resting and feeding by migrating and wintering shorebirds. Species currently experiencing population declines such as the red knot (*Calidris canutus rufa*) and piping plover (*Charadrius melodus*) will be monitored within the state park year-round. Many of the federally-listed piping plover observed are individually marked by researchers on their breeding grounds throughout their range. The piping plovers observed at the park have been traced back to the Great Lakes, Nebraska, South Dakota, Saskatchewan, and other locations where they occur. Piping plovers have high winter site fidelity, and the same marked individuals tend to return to the same site each winter. Portions of the bay side of Shell Island has been designated by USFWS as Critical Habitat for wintering Piping Plovers as of July 10, 2001. Surveys and management for piping plover should follow the Comprehensive Conservation Strategy (U.S. Fish and Wildlife Service 2012). All parks, including St. Andrews, will participate in FWC's winter shorebird survey to accurately capture how many birds are using Florida beaches for wintering and resting. When important resting and feeding areas are identified at these parks, proper signage and protection will be erected. Red knots primarily use the park during the fall and spring migrations and typically forage along the swash zone and at tidal pools on the gulf front. A small number of red knots overwinter and based on individuals that are individually marked, move around sites in the panhandle. Although St. Andrews State Park will not be included as a critical habitat for the red knot, the management plan will include management recommendations for red knot presence.

In addition to the annual FWC winter shorebird survey, Audubon and DRP staff survey the park beach bimonthly for all bird species from September to February 15<sup>th</sup>. Most of the snowy plovers that use Shell Island and the mainland for nesting also use Shell Island as a wintering area. These nesting and wintering patterns

require continuous predator and disturbance control at the park. A specific population of snowy plovers that migrates for the winter has been observed at various beach locations along the Gulf Coast, including Anclote Key State Park, Honeymoon Island State Park, and Dauphin Island, Alabama. A small population of Wilson's plovers also overwinter, however, most migrate to southern regions of Florida for the winter. One female Wilson's plover individually marked on Shell Island wintered at Siesta Key, Florida.

During the seasonal migrations, numerous other imperiled bird species use St. Andrews State Park as an important stopover point for the trans-gulf flight. American kestrels, merlin, peregrine falcons, American redstart, and Louisiana waterthrush are observed during migratory periods. A small number of kestrels, merlin, and peregrine falcons overwinter at the park, often using snags for perches. Appropriate management actions for these species include conserving and maintaining suitable natural area with little to no human disruption or alteration. This is considered Management Action 14 (Other) in the table below. American redstarts and Louisiana waterthrush are rare at the park but may be observed during the spring and fall migrations. Swallow-tailed kites typically use the park only by flying over; however, they may also use the park for foraging since they tend to forage for insects over wet open areas.

Wading birds, such as little blue heron, tricolor heron and reddish egret, are found in coastal dune lake, basin marshes, salt marshes and other wetland habitats. Roseate spoonbills (*Platalea ajaja*) are rare at the park; however, they have been observed during migration foraging in the marsh habitat on both Shell Island and the mainland. All of these wading bird species are designated as Threatened by FWC. Good quality wetlands are important for their foraging and nesting. Hydrology should be maintained in these wetlands, and spraying of insecticide should be minimized as much as possible.

Though no longer listed as imperiled, Southern bald eagle (*Haliaeetus leucocephalus*) are noted here because of the FWC guidelines for activities near eagle nests during the October 1 through May 15 nesting season (FWC 2010). Special precautions are taken near active bald eagle nests, including buffers to prevent disturbance. Eagles nest have been noted in SA-N on Shell Island. Special precautions are also taken to protect osprey (*Pandion haliaetus*) and great horned owl (*Bubo virginianus*) nests that can occasionally be found in snags at the park, primarily on Shell Island. Ospreys and owls need snags for nesting and perching, therefore snags should be left in place for predatory bird management.

Gopher tortoises are found in the park's flatwoods and scrub communities. Although the population is unknown, it is assumed low due to the lack of an abundance of burrows. Only 3 tortoises have been documented at the park, on the mainland. Gopher tortoises have not been documented on Shell Island. Active burrows are very few due in part to past decades of fire exclusion and corresponding habitat degradation within the park and surrounding lands. The remaining tortoises are protected on the park and surrounding public conservation lands, however,

reintroduction of additional individuals may prove necessary due to very low remaining numbers, and very little available recruitment from adjacent areas.

American alligators are observed in marsh habitat at the park, on both the mainland and Shell Island. The most significant threats to American alligators at the park are from interactions with visitors. On the mainland, alligators frequently require removal because they become a threat to the public after recurrent feeding. Additionally, the habitually fed and undaunted alligators are more at risk of poaching by the public due to their visibility. Visitors should be educated on the dangers of feeding or molesting alligators both in terms of harm to the alligator and the visitor.

The Gulf Coast solitary bee is typically present in patches of yellow buttons located on the backside of the beach dune and rosemary scrub communities from August to October depending on the bloom cycle of its host plant. Although not much is known about this bee species, like all bees it is likely sensitive to arthropod control measures with the use of insecticides. The use of insecticides should not take place during the period of time when the solitary bee is present (August to October) in locations where either yellow buttons are present or where the bee has been previously documented. Similarly, the Santa Rosa wolf spider, underfoot tiny sand-loving scarab beetle and the woodruff's polyphyllan scarab beetle all occur in the same communities as the bee and are at risk to the same threats.

Imperiled plant species are managed through the upkeep of the park's natural communities. Both of the imperiled plant species are associated with the dune systems. The listed species found in the dunes and the adjacent coastal grasslands and rosemary scrub including Cruise's golden aster and Godfrey's golden aster. Both imperiled plant species should be monitored once every three years for population health, and yearly visits should document the continued persistence of each species within the park. Protection of dunes from visitor and development impacts and preventing soil disturbance are crucial for managing these species. Godfrey's goldenaster is endemic to the barrier islands from Franklin County to Escambia County. This goldenaster may be in bloom from October – January, but it typically blooms in late October – November. The bright yellow flower heads of this low sprawling plant are easy to spot. The plant has a small basal rosette with dense woolly leaves. The branching stems tend to run along or at least close to the ground and may have woolly leaves as well. Cruise's goldenaster is another endemic plant found on the barrier islands from Walton to Escambia counties. This aster also blooms from October – January, and has bright yellow flowers that are slightly smaller than those of the Godfrey's goldenaster. A current survey for both of these plants are needed. Both of the golden aster species are vulnerable to storm surge, dune erosion and salt spray from tropical storms. Populations were observed to decrease after the tropical storms of 2004 and 2005. They appear to be more plentiful in the dunes after several years without storms.

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and



identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

<b>Table 2. Imperiled Species Inventory</b>						
<b>Common and Scientific Name</b>	<b>Imperiled Species Status</b>				<b>Management Actions</b>	<b>Monitoring Level</b>
	<b>FWC</b>	<b>USFWS</b>	<b>FDACS</b>	<b>FNAI</b>		
<b>PLANTS</b>						
Godfrey's golden aster <i>Chrysopsis godfreyi</i>			LE	G2, S2	10	Tier 1
Cruise's golden aster <i>Chrysopsis gossypina</i> spp. <i>cruiseana</i>			LE	G5T2, S2	10	Tier 1
<b>REPTILES</b>						
American alligator <i>Alligator mississippiensis</i>		FT(S/A)		G5, S4	4, 10, 13	Tier 1
Atlantic Loggerhead <i>Caretta caretta</i>	FT	LT		G3, S3	8, 10, 13	Tier 4
Leatherback sea turtle <i>Dermochelys coriacea</i>	FE	LE		G2, S2	8, 10, 13	Tier 4
Green sea turtle <i>Chelonia mydas</i>	FE	LE		G3, S2	8, 10, 13	Tier 4
Gopher tortoise <i>Gopherus polyphemus</i>	ST	C		G3, S3	1, 7, 8	Tier 3
Kemp's ridley sea turtle <i>Lepidochelys kempii</i>	FE	LE		G1, S1	8, 10, 13	Tier 4
<b>BIRDS</b>						
Red Knot <i>Calidris canutus rufa</i>	FT	LE		G4T2, S2N	8,9,10,13,14	Tier 3

**Table 2. Imperiled Species Inventory**

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Piping plover <i>Charadrius melodus</i>	FT	LT		G3, S2	8,9,10,13,14	Tier 3
Snowy plover <i>Charadrius nivosus</i>	ST			G4,S1	8,9,10,13,14	Tier 4
Wilson's Plover <i>Charadrius wilsonia</i>				G5,S2	8,9,10,13,14	Tier 4
Little blue heron <i>Egretta caerulea</i>	ST			G5, S4	4, 10	Tier 2
Reddish Egret <i>Egretta rufescens</i>	ST			G4, S2	4, 10	Tier 2
Tricolored heron <i>Egretta tricolor</i>	ST			G5, S4	4, 10	Tier 2
Swallow-tailed kite <i>Elanoides forficatus</i>				G5, S2	14	Tier 2
Merlin <i>Falco columbarius</i>				G5, S2	14	Tier 2
Peregrine falcon <i>Falco peregrinus</i>				G4, S2	14	Tier 2
Magnificent frigatebird <i>Fregata magnificens</i>				G5,S1	14	Tier 2
Gull-billed tern <i>Gelochelidon nilotica</i>				G5, S2	8, 10, 13	Tier 3
Caspian tern <i>Hydroprogne caspia</i>				G5, S2	10, 13	Tier 3
Louisiana waterthrush <i>Parkesia motacilla</i>				G5, S2	4	Tier 2
Roseate spoonbill <i>Platalea ajaja</i>	ST			G5, S2	4, 10, 13	Tier 2
American avocet <i>Recurvirostra americana</i>				G5, S2	10, 13	Tier 3

**Table 2. Imperiled Species Inventory**

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Black skimmer <i>Rynchops niger</i>	ST			G5, S3	8, 10, 11, 13	Tier 3
American redstart <i>Setophaga ruticilla</i>				G5, S2	4, 13	Tier 2
Sandwich tern <i>Sterna sandvicensis</i>				G5, S2	8, 10, 13	Tier 3
Least tern <i>Sternula antillarum</i>	ST			G4, S3	8, 10, 11, 13	Tier 3
<b>MAMMALS</b>						
Choctawhatchee beach mouse <i>Peromyscus polionotus allophrys</i>	FE	LE		G5T1, S1	3, 8, 10, 12, 13	Tier 3
<b>INVERTEBRATES</b>						
Santa Rosa wolf spider <i>Arctosa sanctaerosae</i>				G1G2, S1	10, 14	Tier 1
Underfoot tiny sand-loving scarab beetle <i>Geopsammodius subpedalis</i>				G2G3, S2	10, 14	Tier 1
Gulf coast solitary bee <i>Hesperapis oraria</i>				G1G2, S1S2	10, 14	Tier 2
Woodruff's polyphyllan scarab beetle <i>Polyphylla woodruffi</i>				G1,S1	10, 14	Tier 1

**Management Actions:**

1. Prescribed Fire
2. Exotic Plant Removal
3. Population Translocation/Augmentation/Restocking

4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Removal
7. Mechanical Treatment
8. Predator Control
9. Erosion Control
10. Protection from visitor impacts (establish buffers)/law enforcement
11. Decoys (shorebirds)
12. Vegetation planting
13. Outreach and Education
14. Other (conserving and maintaining suitable natural area with little to no human disruption or alteration)

**Monitoring Level:**

- Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e. not conducting species-specific searches). Documentation may be in the form of Wildlife Observation Forms, or other district specific methods used to communicate observations.
- Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.
- Tier 3. Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
- Tier 4. Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
- Tier 5. Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Detailed management goals, objectives and actions for imperiled species in this park are discussed in the Resource Management Program section of this component and the Implementation Component of this plan.

**Exotic and Nuisance Species**

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the greatest ecological damage.

In some cases, native wildlife may also pose management problems or nuisances within state parks. A nuisance animal is an individual native animal whose presence or activities create special management problems. Examples of animal species from which nuisance cases may arise include venomous snakes or raccoons and alligators that are in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP’s Nuisance and Exotic Animal Removal Standard.

Exotic plant species that currently occur at the park include: Lantana (*Lantana camara*), natal grass (*Melinis repens*), torpedo grass (*Panicum repens*), Chinese tallow tree (*Sapium sebiferum*), purple sesban (*Sesbania punicea*), and cogongrass (*Imperata cylindrica*). Park staff are regularly trained on the identification of exotic species that might be present at the park. Although no standardized surveys are conducted, park and district staff document the presence of any exotic plant species observed. After initial documentation, the exotics plants are mapped with a GPS, the size of the infested area is estimated and a general description of the infestation is recorded and entered into the exotic plants database. Intensive control efforts over the past few years have succeeded in reducing the coverage of exotic plant species in the park, which was moderately infested in patches by several FLEPPC category 1 species.

Currently only a single area of lantana infestation is present at the park located within the campground in zone SA-G. Other isolated clumps were found throughout the park in multiple management zones (SA-B, SA-D, SA-E, and SA-F) during previous years. However, these were treated and were no longer present during subsequent assessments.

A scattered patch of natal grass is present at the park in zone SA-A. The patch of natal grass is primarily in and around the District buildings. The infestation areas covered include: outside the District 1 Administration building, around the old visitor center, within the construction yard and north of the road across from the District 1 office. 0.0775 acres of natal grass were treated with herbicide and the infested area will be evaluated at a later date.

Torpedo grass is present on the park in two locations; zone SA-A and SA-H. In zone SA-A, the torpedo grass is located in high densities around the outdoor amphitheater and along the surrounding trails. In zone SA-H, the torpedo grass is located in the top northwest corner in the ruderal area along the western boundary. Both of the infested areas were treated in the last two years and will be reevaluated and retreated until the torpedo grass is no longer evident. Torpedo grass was also present in zone SA-I previously, but was treated in 2010 and when reevaluated in 2012, was no longer present.

The most prevalent invasive at the park is the Chinese tallow tree. Seven zones (SA-C, SA-D, SA-E, SA-F, SA-H, SA-I, and SA-J) at the park have had occurrence of tallow in the past few years. Small patches of multiple trees are scattered throughout multiple natural areas. In zone SA-C 1.2 acres of tallow are scattered from the natural area across from the northerly entrance into the campground to the south, these trees were treated in 2012. All the tallows were found in the standing water of the Buttonbush Marsh. In zone SA-D a small cluster of four trees were located and treated in 2012 near the bathhouse dumpster. There were previously two locations in SA-E, these locations were treated in 2010 and were no longer evident we reevaluated in 2012. There are multiple clusters in SA-F, including one which was successfully treated from 2010 to 2012 and three other sites which were more recently treated. The largest of the sites in this zone is 0.3 acres, where there is tallow located in the swale running between the main park

loop road and the campground, the highest density is located near the west of the park manager residence. Three clusters of tallow were located in SA-H, two of which were treated and cleared in 2010. The third site is the largest with one hundred tallow trees treated in 2012. Two locations in are in SA-I, one of which contains approximately 70 trees (mainly seedlings) treated in 2012 near the park front office mailboxes. Four locations were observed in SA-J, all were treated in 2010. Upon reevaluation in 2012, only one site still had evident tallow trees. The infestation was more extensive at the site than previously realized with 3.1 acres with dense tallow trees.

Purple sesban is present at the park at one site in SA-H near the northern park boundary. The infestation is small in size restricted to 0.03 acres and was treated in 2012 and is limited to a scattering of regrowth individuals.

Cogongrass was observed at three locations in various zones (SA-C, SA-F, and SA-I) in the past few years. All locations are treated yearly in response to annual regrowth.

Japanese climbing fern was originally observed in isolated locations in zone SA-I near the Assistant Manager residence. The infestations were treated and no climbing fern was observed over a number of years. However, recently climbing fern was again located and treated in SA-I near the camper registration building.

Table 3 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2011). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

<b>Table 3. Inventory of FLEPPC Category I and II Exotic Plant Species</b>			
<b>Common and Scientific Name</b>	<b>FLEPPC Category</b>	<b>Distribution</b>	<b>Management Zones</b>
<b>PLANTS</b>			
Lantana <i>Lantana camara</i>	I	2	SA-G
Rose natalgrass <i>Melinis repens</i>	I	2	SA-A
Torpedo grass <i>Panicum repens</i>	I	2	SA-A, SA-H
Chinese tallow tree <i>Sapium sebiferum</i>	I	2	SA-I, SA-H, SA-F, SA-D, SA-C
		3	SA-J
Purple sesban <i>Sesbania punicea</i>	II	0	SA-H

<b>Common and Scientific Name</b>	<b>FLEPPC Category</b>	<b>Distribution</b>	<b>Management Zones</b>
Cogongrass <i>Imperata cylindrica</i>	I	0	SA-C, SA-I, SA-F
Japanese climbing fern <i>Lygodium japonicum</i>	I	0	SA-I

**Distribution Categories:**

- 0 No current infestation: All known sites have been treated and no plants are currently evident.
- 1 Single plant or clump: One individual plant or one small clump of a single species.
- 2 Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.
- 3 Scattered dense patches: Dense patches of a single species scattered within the gross area infested.
- 4 Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.
- 5 Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.
- 6 Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Coyotes harass nesting sea turtles and depredate sea turtle and shorebird nests and chicks. They also flush nesting shorebirds at the park, preventing birds from settling within the habitat for nesting or causing nest abandonment. In addition, the presence of coyotes and other mammalian predators such as foxes can flush nesting shorebirds, leaving eggs and chicks vulnerable to predation by other opportunistic species, including ghost crabs, herons, crows and gulls. Following a year of heavy coyote removal, productivity for nesting shorebirds greatly increases (Pruner et al. 2011). Predator control was initiated in 1997 and continues as funded. Some level of predator removal will be funded at the park for the next five years (2013-2017) with funding provided to the USDA through BP restoration funds. Additional funds from USFWS and FWC will also provide trapping at the park. Removal efforts should continue beyond this window due to the park's connectivity to surrounding areas. Even on Shell Island, following removal, coyotes are able to travel from the mainland through Tyndall Air Force Base. All predator removal efforts on Shell Island should be completed in collaboration with Tyndall AFB.

The presence of coyotes and other mammalian predators should be monitored and detected while monitoring for shorebirds, sea turtle nests, and beach mice. Any observations of known predation to nests should be recorded and reported. Park staff should work with district biologist to assess the threat and work with trappers to decide the best method to achieve control. Screening of sea turtle nests in order to prevent successful nest depredation from coyotes should continue. Trapping coyotes in winter prior to shorebird and sea turtle nesting season is recommended as the most effective method of control due to cooler temperatures and to minimize disturbance to shorebird nests and chicks during the trapping process.

Raccoons can be a nuisance by raiding campsite dumpsters and stealing food from park visitors. Once raccoons become habituated, they can become a danger to

visitors Efforts to remove the raccoons and educate the public on the impacts of feeding wildlife are needed at the park. In addition, raccoons can be effective predators of sea turtle and shorebird nests in coastal habitats. A group of raccoons can deplete a nesting colony in a single night. Raccoon abundance tends to increase as coyotes are removed from the habitat. The raccoon population should be assessed and trapping efforts should coincide with coyote removal.

Feral cats and red and gray foxes can be detrimental to populations of beach mice and shorebirds. Feral cats are very effective at hunting small mammals and birds. In addition to feral cats, well-fed owned cats can range away from home and into the dune system. Feral cats have been present at the park for many years. Monitoring for the presence of feral cats and foxes should be integrated with the monitoring of beach mice. Trapping should be initiated when cat tracks are found. Although red and gray foxes have not been documented at the park in the past few years, monitoring for the presence should continue.

The abundance of Virginia opossum is increasing on Shell Island. Opossum have been documented as the source of predation for snowy plover, Wilson's plover and least tern nests. As coyote removal efforts increase, trapping for opossum will likely become more important.

Currently there are black and Norway rats present in large numbers in the campground, District 1 office and other park facilities. Not only are the rats a vector for disease transmission, but they are capable of damaging park facilities and assets belonging to park visitors (e.g., tents, RVs). Rats are also very adept generalist foragers. They can quickly out-compete native wildlife and if present in large enough numbers can impact ground nesting species such as shorebirds. Rats have severely reduced seabird and shorebird colonies in other regions of the world. Although poison control methods are effective for controlling rat infestations, the use of poisons is not recommended at the park due to the potential for secondary poisoning to wildlife such as great horned owls and to park visitors' pets.

Alligators are frequently observed basking along the shores of Gator Lake. These alligators are regularly fed by park visitors and become habituated to the presence of humans. Because habituated alligators have the potential to be dangerous to park visitors, FWC removes problem alligators when necessary. Efforts to increase interpretive signage at the park and enforcement of park regulation related to feeding wildlife are needed to reduce these occurrences.

Detailed management goals, objectives and actions for management of invasive exotic plants and exotic animals are discussed in the Resource Management Program section of this component.

### **Special Natural Features**

St. Andrews State Park is the only park in Florida that manages the land on both sides of a major navigation inlet.



## **Cultural Resources**

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the FDOS, Division of Historical Resources (DHR) management procedures for archaeological and historical sites and properties on state-owned or controlled properties; the criteria used for evaluating eligibility for listing in the National Register of Historic Places, and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization, and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that will become 50 years old during the term of this plan.

### **Condition Assessment**

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists to the ideal condition. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually a cause for concern. Poor describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

### **Level of Significance**

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

There are no criteria for determining the significance of collections or archival material. Usually, significance of a collection is based on what or whom it may represent. For instance, a collection of furniture from a single family and a particular era in connection with a significant historic site would be considered

highly significant. In the same way, a high quality collection of artifacts from a significant archaeological site would be of important significance. A large herbarium collected from a specific park over many decades could be valuable to resource management efforts. Archival records are most significant as a research source. Any records depicting critical events in the park's history, including construction and resource management efforts, would all be significant.

The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

### **Prehistoric and Historic Archaeological Sites**

*Desired future condition:* All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

*Description:* The Florida Master Site File (FMSF) has seven sites recorded at the park. At the park four sites represent pre-historic or aboriginal cultural periods. A fifth prehistoric site on file has since been destroyed and lost due to erosion and construction. Two of the pre-historic sites also have historic refuse present and two additional sites have solely historic remains. As a barrier island exposed to high wave energy, it is possible if not probable that other historic sites located here have been lost to natural erosion as the location of the island has shifted over time.

Throughout Florida there is evidence of prehistoric occupation dating to the late Pleistocene. The Pleistocene was associated with the most recent ice age which began 1.8 million years ago and ended about 12,000 years ago. The impacts from the Pleistocene and the changing water levels in relation to glaciation patterns can be viewed at the park when viewing the natural community maps. In particular, the dune ridges found within the park, now coastal scrub, are relic dunes from a changing coastal shoreline. Cultural sites found at the park do not date back to the Pleistocene, but do depict indigenous groups that utilized the fertile waters and land associated with St. Andrew Bay. Based on the evidence found in the park, there was Weeden Island (200–700) and Fort Walton (1000 – Historic) occupation. Three sites appear to be associated with the Weeden Island period (BY86, BY87, and BY798) and three sites appear to be associated with the Fort Walton Period (BY86, BY170, and BY171). The Weeden Island Period is also characterized by the production of pottery and some type of agricultural cultivation of crops to supplement wild food sources. With the production of crops, villages in the Woodland period may have been more permanent and not as migratory. Given the presence of shell middens at the park, Native Americans utilized the maritime habitat, primarily hammocks and foraged on shell fish (e.g., oysters, scallop and conch, etc.). Sites at the park include shell midden sites along shoreline (BY86, BY87, BY170, and BY171); some quite large when originally recorded (ex. BY86, BY87). These sites have substantially eroded since they were originally identified. Large shell midden sites have been interpreted as village sites. Some of the shell

middens include ceramic artifacts and faunal material (animal bones). One site includes an interior site with shell midden and earthen mounds.

The Spanish began exploring and colonizing Florida during the 16<sup>th</sup> century with the goal of expanding the Spanish Empire. The First Spanish Period in Florida is characterized by Spanish settlements including forts, missions, and ports. Many locations throughout Florida, including the Florida panhandle, bear names with Spanish origin, including the name of St. Andrew, in evidence of Spanish colonization. One possible Spanish or early colonial settlement occurs on the park. The remnant structure was tentatively identified as 18<sup>th</sup> century and may be of Spanish origin (BY87).

Evidence of the early colonial period is also represented at the park. Including a homestead sites, a late 19<sup>th</sup> – early 20<sup>th</sup> century structure at BY798, unidentified temporal association at BY86. These sites include artifact scatters, structural remains, landscape alteration (vegetation removal) and features (possible well or outhouse), and/or cultural plantings (such as mulberry and plum trees). Additionally, remnants of an early 20<sup>th</sup>-century tourist attraction, a small zoo with animal pens, are present at BY87.

Due to the favorable weather and abundant land, Florida was one of the primary locations selected for military construction during World War II. As part of this period, the park was part of the St. Andrews Military Reservation in Bay County during WWII. During the site's use as a military reservation, guns were mounted at two positions built atop dunes overlooking the sound as part of a temporary harbor defense on the mainland (BY1341 and BY1342). The complex also included small temporary structures to house the platoon staffing the guns and several temporary support buildings. The two WWII coastal gun positions were constructed in 1943 and staffed by a platoon of Battery C of the 13th Coast Artillery as part of the Temporary Harbor Defense of Panama City until it was inactivated in 1944. One of gun mounts is now covered by a pavilion and used as observation point, and one is buried under sand dunes, occasionally exposed by hurricanes.

*Condition Assessment:* Due to the maritime conditions of the park, erosion by tides, boat wakes, storm surges and wind is the primary impact to sites located along the shoreline. Erosion has substantially impacted these sites via the loss of site components (typically shell midden) located on the water's edge. For example, the shell material is often removed from its original context, scattered and then redeposited elsewhere on land or offshore. The rate of deterioration and the amount of each site destroyed is currently unknown.

According to records, two sites appear to have been heavily disturbed or destroyed due to erosion and campsite construction prior to the 1980s, including BY170 and BY171. These sites are either in poor condition or not accessible because they no longer exists. A couple of sites are partially, completely or intermittently covered by coastal sand dunes that form, shift and disappear in wind and wave (ex. BY798, BY86–exposed in sand dune intermittently).

Some sites show signs of unauthorized visitation, including camping, campfires and debris. In certain instances this visitation has caused a minimal level of damage, such as the displacement of artifacts from their original context. It is unknown whether artifacts are being removed from the sites at this time.

In general, inland sites are better protected from erosion and simultaneously, because they are remote, they are less visited by park visitors (ex. BY798, BY87). These sites are in fair to good condition.

The two gun mounts (BY1341 and BY1342) are both in good condition. The geophysical location of one of the gun mount is at a vantage point providing limited opportunities for erosion to the site. Based on observations in 2006 when the site was exposed by hurricane activity the gun mount is in good condition. Although the areas is well used by park visitors, the site is protected from disturbance and from normal environmental wear by because it is buried beneath 10 feet of sand.

There is sparse information about sites such as the old zoo located on Spanish Ante Point. For example, there are no records of when or why the monkey cages were removed from the site. Interviews with past park staff and administrators are needed to fill information gaps regarding the park's cultural sites.

*Level of Significance:* St. Andrews State Park contains three large shell midden sites (BY86, BY87 and BY798) that may be eligible for listing on the National Register of Historic Places; additional research is required to complete their documentation and evaluation. All three of these village sites date to the Weeden Island period; additionally, BY86 also has a later Fort Walton component and BY798 contains earthen mounds. The sites were noted for their research potential based on their content and good state of preservation. It is unknown how much what impact condition decline has had on their integrity in the last few decades.

St. Andrews State Park also contains two WWII-era gun mounts (BY1341 and BY1342) associated with the harbor defense at former St. Andrews Military Reservation by Battery C of the 13<sup>th</sup> Coast Artillery. Additional evaluation is needed to determine whether these are significant as part of a larger set of WWII-era cultural resources along Florida's Panhandle Gulf coast. The park's archaeological sites have not yet been evaluated by the State Historic Preservation Office.

*General Management Measures:* The main threat to the cultural sites, such as 8BY86 and 8BY170, are shoreline erosion and tidal overwash. The bayshore is eroding in some areas and accreting in others. Unfortunately preventing the natural movement and shifting of sediment to stabilize these sites can be difficult and is not recommended for the eroding sites at the park. The park will consult with DHR for shoreline stabilization measures if recommended in the future. If recommended, the park will work with DHR to seek grant funding to stabilize the shorelines adjacent to cultural sites. Further research should be conducted on some these sites so that they can be documented for future generations even after the sites have completely eroded into the bay.

Unauthorized collection is a potential problem at the many of the cultural sites at the park such as 8BY86, 8BY170, and 8BY789. There is evidence of unauthorized camping and visitor presence at these three sites. Closure of these areas, interpretation, and law enforcement should be used to prevent looting.

### **Historic Structures**

*Desired future condition:* All significant historic structures and landscapes that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

*Description:* Eighteen historic structures within the park are currently filed with the FMSF. These structures were built between 1952 and 1969 and will therefore become 50 years of age during the ten-year Unit Management Plan period.

Seventeen of these structures are refurbished buildings dating from the military's occupations of the property as a coastal artillery unit during WWII. These buildings were constructed during WWII, when Florida was a primary location for military construction and training. The land encompassing St. Andrews State Park was at that time part of the St. Andrews Military Reservation. For example, the structure that houses the DRP's District 1 office (BL067004) was originally a barracks and the District 1 training center (BL067003) originally served as the a mess hall. The other structures include a residence (BL067017), two picnic shelters (BL067019 and BL067020), a bathhouse (BL067021), four shop/storage sheds (BL067006, BL067034, BL067031 and BL067037), two combo buildings that are currently used as bathhouses (BL067011 and BL067012), one general store (BL067029), two pavilions (BL067027 and BL067028), one pumphouse that is decommissioned (BL067030) and one subcenter that is now used a bathhouse (BL067039).

The last structure on the park is a Turpentine Still (BL067032). The structure is not eligible for listing on the National Register because the building itself is a replica of the original. The park possess an actual turpentine still that was moved from off-site that is located inside of the building replica. The still was moved from 50 miles away and reconstructed. Although no turpentine production activities were ever conducted on the park property, this structure and associated artifacts represent the turpentine industry and naval stores of the early 20<sup>th</sup> century. Primarily utilized for interpretive and educational purposes, the replica of the wooden structure houses an authentic collection of distillery artifacts, including a giant metal condenser coil, screen vats, cast iron furnace, and other components.

*Condition Assessment:* The historic structures in the park vary in condition, from poor to good. The Assistant Manager Residence (BL067017), Dining/Storage D1 Training Center building (BL067003), the Office-Admin D1 building (BL067004) and the General Store (BL067029) are generally in good condition. The Lagoon Bathhouse (BL067021), the Storage/Construction Center (BL067006), two Combo Buildings (BL067011 and BL067012), two picnic pavilions (BL067027 and BL067028), three storage shed buildings (BL067034, BL067031, and BL067037),

and the Subcenter-Lagoon (BL067039) are in fair condition. Two picnic shelters (BL067019 and BL067020), the Pumphouse-Lagoon (BL067030), and the Turpentine Still (BL067032) are in poor condition.

The buildings should be rehabilitated as needed. Most of buildings that are in fair condition are not severely threatened at this time and with spot repair and regular maintenance may be brought into good condition. The primary threats to the building are environmental. For example, heat and moisture have caused some wood deterioration and paint failure.

The pumphouse listed in poor condition should be removed because it is no longer in use. The Turpentine Still needs to be restored to meet safety standards contingent on funding. The structure and associated artifacts are rusting and generally falling apart and needs to be repaired.

*Level of Significance:* None of the historic structures at the park that are listed on the FMSF meet the criteria for eligibility in the National Register of Historic Places either individually or as a district. All are standard park buildings, and none of the buildings are unique in either their style or design. Several of the buildings have had their original appearance altered by the addition of new materials.

*General Management Measures:* Although none of the eighteen historic structures are significant in terms of National Register eligibility, most of the structures are regularly used for park functions. Therefore, rehabilitation is the preferred treatment for the structures until such time as the DRP may elect to demolish or otherwise remove the structures.

## **Collections**

*Desired future condition:* All historic, natural history, and archaeological objects within the park that represent Florida's cultural periods, significant historic events or persons, or natural history specimens are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

*Description:* At this time, the park possesses collections items that were either donated to the Friends of St. Andrews State Park or loaned from the Museum of Florida History. Various small historic artifacts from Teddy the "Hermit" are on display in a glass showcase within the Environmental Interpretive Center (EIC). The EIC also displays two large dioramas that are protected by plexiglass. One diorama includes taxidermy-based specimens indicative of local and regional wildlife species. The second diorama features synthetic-based specimens indicative of marine life found at the Jetties swimming area. Several smaller wildlife displays include taxidermy-based birds, preserved bird eggs, preserved butterflies, and shells. All of these displays are protected under plexiglass covers. Another display in the EIC includes replica sea turtle eggs and hatchlings. This display includes three separate components, all protected in plexiglass cases.

The EIC also has a display of replica prehistoric projectile points, arrowheads, as well as pottery sherds and bone artifacts. This collection represents common artifacts affiliated with local aboriginal cultures, including Fort Walton and Weeden Island. This display is wall-mounted in a shadow-box and is protected by a plexiglass cover. Lastly, the EIC houses a saltwater aquarium that includes a variety of reef fish, which is maintained by a professional aquarist under contract with the park. All historical documents, paper records (correspondence letters, books, newspaper clippings, etc.), photographs and MFH loan agreement forms are stored in a filing cabinet in the Ranger Station. Currently, the Park Services Specialist/Volunteer Coordinator is responsible for the upkeep, maintenance, organization, and collection of these items. The Friends of St. Andrews State Park may have additional collection materials; however, they are most likely donations from citizens and are not directly associated with St. Andrews State Park.

Other specimens that have been recovered on park property, such as modern animal bones and shells, are occasionally utilized in interpretive programs. These items are not cataloged or inventoried. Aside from exhibits displayed in the EIC, there is a collection of turpentine industry artifacts located near the Turpentine Still. This collection is protected by wooden railing; however, there is currently no shelter or structure protecting the metal and wood artifacts from the weather or elements. The Turpentine Still itself is the largest interpretive exhibit featured at the park. While the wooden structure is a replica of the original, all of the internal metal still artifacts are considered collection items.

*Condition Assessment:* The items currently in the park's collection are in good condition. However, the Turpentine Still collection items are exposed outdoors to the elements; the building itself is in need of maintenance, while the collections items inside may need to be inspected for degradation and corrosion. While all of the collections items are helpful in communicating the park's cultural and natural heritage to the public, the collection items within the EIC do not possess a monetary value significant to warrant the purchase of insurance; nor do they require formal curation or preservation. It is unknown what monetary value the Turpentine Still-related collection items may have, if any.

*Level of Significance:* Of the collections items, the most relevant to St. Andrews State Park are the Teddy the "Hermit" artifacts. In addition, the shells, taxidermy-based birds and butterflies, as well as the sea turtle exhibit demonstrate a significance in terms of being directly tied to the park's ecological communities. The pre-Historic cultural resources also provide an important function as visual interpretive tools, since public access to the actual archaeological sites and associated artifacts is not feasible. Although the industry associated with turpentine was not practiced on park property, the Turpentine Still exhibit does demonstrate the significance of the industry within a regional context. The additional displays mentioned do not demonstrate a high level of historically intrinsic significance; however, they do garner interest by the public and provide a significant value for visual interpretive purposes.

*General Management Measures:* The majority of the exhibited collection items are housed in the EIC, which is a climate controlled environment that would not expose these items to the elements or degradation. However, there is no monitoring of humidity levels. Currently, there is no Scope of Collections Statement in effect for the aforementioned assemblage of items. It should be noted that some of the historical artifacts associated with the Turpentine Still, which were located in an outdoor wooden kiosk with plexiglass-protected coverings was broken into and the collection items were stolen. Since then, all collection items that are small enough to be concealed, lifted, or carried, have been removed from any outdoor locations and either installed in the EIC where they can be better monitored or removed from display entirely. The current Park Services Specialist/Volunteer Coordinator that is handling the MFH loan agreements and other relevant collections information is currently devising a system to better manage, maintain and record current collections conditions, locations, values, and significance.

Detailed management goals, objectives and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 4 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

<b>Table 4. Cultural Sites Listed in the Florida Master Site File</b>					
<b>Site Name and FMSF #</b>	<b>Culture/Period</b>	<b>Description</b>	<b>Significance</b>	<b>Condition</b>	<b>Treatment</b>
8BY87 Spanish Ante Point	Weeden Island; Historic 18 <sup>th</sup> & 20 <sup>th</sup> Century	Archaeological Site; historic refuse	NE	G	P
8BY86 Spanish Ante Cove West Midden	Weeden Island; Historic - Unknown	Archaeological Site; historic refuse	NE	F	P
8BY170 1 <sup>st</sup> site west of jetties on the bayside	Weeden Island	Archaeological Site	NE	P	N/A
8BY171 Wiles Clark site	Weeden Island	Destroyed	NE	NA	N/A



<b>Table 4. Cultural Sites Listed in the Florida Master Site File</b>					
<b>Site Name and FMSF #</b>	<b>Culture/Period</b>	<b>Description</b>	<b>Significance</b>	<b>Condition</b>	<b>Treatment</b>
8BY798 Shell Island Mound	Weeden Island II; Historic late 19 <sup>th</sup> and early 20 <sup>th</sup> Century	Archaeological Site; historic refuse	NE	F	P
8BY798 Shell Island Mound	Weeden Island II; Historic 20 <sup>th</sup> Century	Archaeological Site; historic refuse	NE	F	P
8BY1341 1942 WWII Gun Mount 01	20 <sup>th</sup> Century (1942)	WWII Gunmount	NE	G	P
8BY13412 1942 WWII Gun Mount 02	20 <sup>th</sup> Century (1942)	WWII Gunmount	NE	G	P
BL067017 Assistant Manager Residence	20 <sup>th</sup> Century (1956)	Historic Structure	NE	G	RH
8BY1655 Picnic Shelter #2	20 <sup>th</sup> Century (1956)	Historic Structure	NE	P	RH
8BY1656 Picnic Shelter #3	20 <sup>th</sup> Century (1956)	Historic Structure	NE	P	RH
BL067021 Lagoon Bath	20 <sup>th</sup> Century (1961)	Historic Structure	NE	F	RH
BL067003 Dining/Storage D1 Training Office	20 <sup>th</sup> Century (1962)	Historic Structure	NE	G	RH
BL067004 Office-Admin/DA	20 <sup>th</sup> Century (1962)	Historic Structure	NE	G	RH

<b>Table 4. Cultural Sites Listed in the Florida Master Site File</b>					
<b>Site Name and FMSF #</b>	<b>Culture/Period</b>	<b>Description</b>	<b>Significance</b>	<b>Condition</b>	<b>Treatment</b>
BL067006 Storage/ Construction Center	20 <sup>th</sup> Century (1962)	Historic Structure	NE	F	RH
BL067011 Combo Bldg. 1	20 <sup>th</sup> Century (1962)	Historic Structure	NE	F	RH
8BY1654 Combo Bldg. 2	20 <sup>th</sup> Century (1962)	Historic Structure	NE	F	RH
BL067029 General Store	20 <sup>th</sup> Century (1964)	Historic Structure	NE	G	RH
BL067027 Pavilion 1- Picnic	20 <sup>th</sup> Century (1965)	Historic Structure	NE	F	RH
BL067028 Pavilion 2- Picnic	20 <sup>th</sup> Century (1965)	Historic Structure	NE	F	RH
BL067030 Pumphouse- Lagoon	20 <sup>th</sup> Century (1966)	Historic Structure	NE	P	RH
BL067032 Turpentine Still	20 <sup>th</sup> Century (1966)	Historic Structure	NE	P	RS
BL067034 Shop/Equip. Shed	20 <sup>th</sup> Century (1966)	Historic Structure	NE	F	RH
BL067031 Grease House	20 <sup>th</sup> Century (1967)	Historic Structure	NE	F	RH
BL067037 Shelter- Equip.	20 <sup>th</sup> Century (1969)	Historic Structure	NE	F	RH
BL067039 Subcenter- Lagoon	20 <sup>th</sup> Century (1969)	Historic Structure	NE	F	RH

**Significance:**

- NRL National Register listed
- NR National Register eligible
- NE Not evaluated
- NS Not significant

**Condition:**

- G Good
- F Fair
- P Poor
- NA Not accessible
- NE Not evaluated

**Recommended Treatment:**

- RS Restoration
- RH Rehabilitation
- ST Stabilization
- P Preservation
- R Removal
- N/A Not applicable

**RESOURCE MANAGEMENT PROGRAM**

**Management Goals, Objectives and Actions**

Measurable objectives and actions have been identified for each of the DRP's management goals for St. Andrews State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion and estimated costs to fulfill the management goals and objectives of this park.

While the DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer- term work plans are developed for natural community restoration and hydrological restoration. The work plans provide the DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

The work plans are reviewed and updated annually. Through this process, the DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Sections 253.034 and 259.037, Florida Statutes.

The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. The ten-year management

plan is based on conditions that exist at the time the plan is developed. The annual work plans provide the flexibility needed to adapt to future conditions as they change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

## **Natural Resource Management**

### **Hydrological Management**

**Goal: Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.**

The natural hydrology of most state parks has been impaired prior to acquisition to one degree or another. Florida's native habitats are precisely adapted to natural drainage patterns and seasonal water level fluctuations, and variations in these factors frequently determine the types of natural communities that occur on a particular site. Even minor changes to natural hydrology can result in the loss of plant and animal species from a landscape. Restoring state park lands to original natural conditions often depends on returning natural hydrological processes and conditions to the park. This is done primarily by filling or plugging ditches, removing obstructions to surface water "sheet flow," installing culverts or low-water crossings on roads, and installing water control structures to manage water levels.

***Objective A: Conduct/obtain an assessment of the park's hydrological restoration needs.***

- Action 1 Determine how stormwater is impacting natural communities adjacent to the park road
- Action 2 Assess culverts along park road to ensure water flow is adequate to preserve hydrology of the basin marsh

An assessment of the culverts along the park drive should be conducted to ensure adequate water flow of the bisected basin marsh. When the road was built, it disrupted the natural hydrology of the marsh. The culverts may be too small or periodically blocked by sand or other accumulated debris. A maintenance schedule may need to be established to ensure functionality of the current culverts.

***Objective B: Restore natural hydrological conditions and functions to approximately 0.2 acres of mesic flatwoods natural community***

- Action 1 Assess how stormwater from adjacent developments at the northern park boundary is impacting mesic flatwoods
- Action 2 Determine corrective measures, potentially adding appropriate water holding structures
- Action 3 Develop restoration plan to restore the mesic flatwoods

The stormwater drainage coming from the neighboring development at the northern boundary is impacting the flatwoods. The culverts from the development transport

stormwater directly into the park, creating runoff streams throughout the flatwoods, eventually filling a swale located in the flatwoods. The stormwater flow is also dispersing exotic plants throughout this area. The park has placed material (e.g., cement pieces, etc.) at the site in an attempt to keep the water pooled on the development side of the property. However, with enough rain, the stormwater breaches and the water flows into and floods the flatwoods at the park. The flatwoods habitat should be restored to its original contours. A survey is needed to determine how and where to redirect the stormwater. Water quality should also be tested to ensure pollutants from the development are not entering the park. Once a survey is completed, a restoration plan should be developed.

### **Natural Communities Management**

**Goal: Restore and maintain the natural communities/habitats of the park.**

The DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large-scale restoration projects as well as smaller scale natural communities' improvements. Following are the natural community management objectives and actions recommended for the state park.

*Prescribed Fire Management:* Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

All prescribed burns in the Florida state park system are conducted with authorization from the FDACS, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

***Objective A: Within 10 years, have 352.6 acres of the park maintained within the optimum fire return interval.***

- |          |   |
|----------|---|
| Action 1 | Develop/update annual burn plan.  |
| Action 2 | Manage fire-dependent communities by burning between 59 and 161.3 acres annually. |

Table 5 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target for acres to be burned.

<b>Table 5. Prescribed Fire Management</b>		
<b>Natural Community</b>	<b>Acres</b>	<b>Optimal Fire Return Interval (Years)</b>
Wet Flatwoods	31.3	2-5
Mesic Flatwoods	233.8	2-5
Scrubby Flatwoods	3.1	5-15
Basin Marsh	84.4	3-15
Annual Target Acreage	59-161.3	

Prescribed fire is planned for each burn zone on the appropriate interval. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to changing conditions, fire management requires careful planning based on annual and very specific burn objectives. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan.

In order to track fire management activities, the DRP maintains a statewide burn database. The database allows staff to track various aspects of each park's fire management program including individual burn zone histories and fire return intervals, staff training and experience, backlog, etc. The database is also used for annual burn planning which allows the DRP to document fire management goals and objectives on an annual basis. Each quarter the database is updated and reports are produced that track progress towards meeting annual burn objectives.

Fire-dependent natural communities at the park include mesic flatwoods and basin marshes. Local wildlife populations that depend on or benefit from well-maintained, fire adapted natural communities include gopher tortoise, pygmy rattlesnake (*Sistrurus miliarius*), coachwhip (*Masticophis flagellum*), bobcat (*Lynx rufus*), southeastern American kestrel, loggerhead shrike (*Lanius ludovicianus*), brown-headed nuthatch (*Sitta pusilla*), and pine warbler (*Dendroica pinus*). Prescribed burning is the primary management tool for mimicking natural process and improving and maintaining quality habitats for these and many other wildlife species, particularly in areas previously fire suppressed.

Bald eagles are often found nesting on Shell Island in large pine trees near the coastal dune lake. Care should be taken while burning in this area. Ideally burns should occur when the nest is no longer active. However, if conditions do not allow burning out of the eagle nesting season, steps should be taken to protect the nest. Protection efforts will include hand clearing all flammable live fuels and litter around the base and burning out a buffer around the tree.

It is the intent, that routine prescribed burning, in accordance with recommended fire return intervals, will maintain lower fuel loads, allowing for cooler fires with a resulting mosaic of burned vs. unburned areas. Shell Island may need burned at a greater fire return interval, depending on impacts from tropical storm and the associated storm overwash and salt spray. Burning tropical storm damaged trees,

may result in a greater tree mortality rate. Most of the park's management zones are delineated by well-established resource management roads, main roads or permanent natural breaks such as estuarine water bodies and dune fields. When necessary, temporary firebreaks or access trails are established in order to provide for fire containment and burn crew safety. Temporary firebreaks should be placed without impacting the hydrology of the areas. For example, firelines should not ring marsh habitats. Instead the fireline should be constructed to allow both fire and water into the habitat.

Fire type communities, located in coastal areas, tend to burn very well, even with light to moderate fuel loading. All burns since reintroducing prescribed fire on the mainland have been conducted with northerly winds to minimize smoke impacting the neighboring developments. In addition, zones with an urban interface will receive mechanical fuel reduction if needed prior to any prescribed fire treatments to reduce fire intensity. Park staff will be responsible for tracking weather conditions throughout the burn season, and identifying potential burn windows based on weather forecasts.

Park staff will communicate with the district burn coordinator, and regional fire managers, in order to gather additional burn crew and equipment needed to safely conduct burns. Additionally, park staff will communicate with neighboring residents adjacent to the burn zones to inform residents of any planned prescribed burns that occur along the urban interface. Many neighboring residents do not understand the purpose of prescribed fire at the park. Therefore, information on the benefits of prescribed fire in the fire type natural communities at the park should be provided to neighboring residents. In addition, kiosks on the importance of prescribed fire should be placed at the park to provide interpretive information for park visitors.

All fire suppression equipment will be routinely inspected and operationally tested. Any necessary maintenance/repairs will be accomplished or facilitated by park staff, or if necessary, coordinated with the district burn coordinator. Accurate and complete rainfall data will be maintained on-site, in order to effectively track the local drought index and plan prescribed fire activities.

Burn zones should be monitored via photo points. Photo points should be established within representative areas of a given burn zone. Photo points within Shell Island burn zone should include representative areas of coastal scrub in order to determine long term fire effects on the signature vegetative component. Appropriate length fire return intervals (FRI) for individual management zones will continue to be refined, in order to remain sensitive to less fire tolerant native, on-site species.

*Natural Community Restoration:* In some cases, the reintroduction and maintenance of natural processes is not enough to reach the desired future conditions for natural communities in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that may include mechanical treatment of vegetation or soils and reintroduction or augmentation of native plants

and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

Examples that would qualify as natural community restoration, requiring annual restoration plans, include large mitigation projects, large-scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative modifications. The key concept is that restoration projects will go beyond management activities routinely done as standard operating procedures such as routine mowing, the reintroduction of fire as a natural process, spot treatments of exotic plants, and small-scale vegetation management.

***Objective B: Conduct habitat/natural community restoration activities on variable acres of beach dune community following tropical storm activity.***

- Action 1      Develop/update site specific restoration plan after a major storm event.
- Action 2      Develop shorebird nesting predictive models, based on historic distribution data, to strategize dune restoration efforts while maintaining habitat requirements for a suite of coastal species.
- Action 3      Implement dune creation and/or dune revegetation restoration plan.

The park should assess, plan and restore beach dunes after tropical storms when impacts are moderate to severe. The park should focus on planting in order to mimic the natural dune building process. The park should monitor the progress of dune restoration by using photo points.

Tropical storms impact the beach and dune communities at the park. Erosion and species composition changes result from tropical storm impacts. Since tropical storms are a dynamic process, predicting the exact need for restoration in advance is impossible. After previous storms, some dune restoration has been conducted at the park to try and slow erosion and protect the beach dune community. Restoration after a tropical storm may include debris removal, and planting dune vegetation. Installation of post, rope and signs to prevent visitor trampling are needed to maintain the dune restoration efforts. Dune restoration is the most important of all the restoration projects for the park. A dune restoration plan should be created prior to ensure that areas of sparse vegetation, shell debris from storm activity and dune blowouts remain for nesting shorebirds.

***Objective C: Stabilize bay shoreline and reduce erosion on 0.8 miles of estuarine unconsolidated substrate.***

- Action 1      Assess and monitor current erosion along the bay shoreline.
- Action 2      Develop/update site specific restoration plan and design for living shoreline.
- Action 3      Implement living shoreline project.
- Action 4      Design and implement interpretive signage.



Wave activity along the bay shoreline near the campground on the mainland has led to severe erosion. To combat this erosion, a living shoreline restoration project should be placed along the eroding area to stabilize and prevent further loss of the shoreline. An engineering survey is needed prior to restoration planning in order to develop restoration plans and designs. If a living shoreline is pursued for the area, interpretive programs should be created to minimize trampling by park visitors.

*Natural Community Improvement:* Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat manipulation. Following are the natural community/habitat improvement actions recommended at the park.

***Objective D: Conduct natural community/habitat improvement activities on 0.4 acres of beach dunes and 0.2 acres of scrub on Shell Island and 0.2 acres on the mainland.***

- Action 1 Visually inspect habitat for the use and creation of unauthorized trails through the beach dune and scrub natural communities.
- Action 2 Develop/update site specific restoration plan and design for habitat improvement.
- Action 3 Implement site specific restoration plan.

The beach dune and adjacent scrub habitat on the bay shoreline of Shell Island is eroding from excessive unauthorized trails through the area. Visitors to the island arrive by boat on the bay shoreline and may walk over the dunes in this area to the Gulf side. Despite the presence of posts and rope to close the habitat to park visitors, human foot traffic is continuously observed on unauthorized trails traversing the dunes. Impacts are apparent where trails and eroded sand shifting down to the base of the dune. Native plants should be used to restore the habitat. As part of the improvement project, educational materials should be placed in the area to interpret the importance of the dunes, impacts to the dune community from foot traffic, and park regulations.

The beach dune acreage on the mainland is in need of restoration following the relocation of the pier store. A restoration plan specific to this area is needed.

**Imperiled Species Management**

**Goal: Maintain, improve or restore imperiled species populations and habitats in the park.**

The DRP strives to maintain and restore viable populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS, and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet the DRP's mission. Long-term monitoring is also essential to ensure the effectiveness of resource management programs. Monitoring efforts must be prioritized so that the data collected provides information that can be used to improve or confirm the effectiveness of management actions on conservation priorities. Monitoring intensity must at least be at a level that provides the minimum data needed to make informed decisions to meet conservation goals. Not all imperiled species require intensive monitoring efforts on a regular interval. Priority must be given to those species that can provide valuable data to guide adaptive management practices. Those species selected for specific management action and those that will provide management guidance through regular monitoring are addressed in the objectives below.

***Objective A: Develop/Update baseline imperiled species occurrence inventory lists for plants and animals.***

DRP staff and district biologist will continue to build and refine the park's inventory lists for flora and fauna. Documentation of any newly identified imperiled species will be a priority. Depending on funding, a full plant survey needs to be conducted at the park to determine presence and location of other listed plant species. In addition, the park has never been fully surveyed for herptofauna, insects, bats, or birds. If funding is available, surveys for these species should be conducted and the species list updated. The park will work with FWC and DRP district biologists to conduct limited surveys, update the imperiled species lists, and utilize observations to update the arthropod control plan to minimize the impacts of spraying to potentially sensitive species.

***Objective B: Monitor and document 12 selected imperiled animal species in the park.***

- Action 1      Develop monitoring protocols for 2 selected imperiled animal species including gopher tortoise and the solitary bee.
- Action 2      Implement monitoring protocols for 12 imperiled animal species including sea turtles, nesting shorebirds, beach mice and migratory shorebirds.
- Action 3      When applicable, monitor the beach dune system and determine beach mice and shorebird distribution and population health in response to tropical storm impacts.

Sea turtle nests, including loggerhead and leatherbacks, are monitored by staff using strict methods and protocols developed by FWC that fully census the

population of nesting sea turtles and hatchlings, as well as hatchling success rates. Monitoring methods and protocols included nest surveys, nest inventories, and survey of disorientations and strandings (FWC Conservation Guidelines for Marine Turtles 2007).

Snowy plover, Wilson's plover, American oystercatcher, least tern and black skimmer nesting is monitored to determine the number of nesting attempts, the number of nesting adults, nest fate, sources of predation, and annual productivity. Snowy plovers, Wilson's plovers, and American oystercatchers are banded with individual color combinations to help biologists determine productivity as well as juvenile survival, adult survival, natal dispersal, and between-season and in-season dispersal. These efforts will help determine the level of connectivity for these species from St. Andrews State Park to other beaches throughout Florida and the Gulf Coast, and eventually determine population growth in response to management actions. Research on distribution and productivity following tropical storms and current dune restoration protocols are needed.

Other shorebirds, including federally-listed piping plovers and red knots will be monitored for presence, over-winter abundance, habitat use, and dispersal. These two species are regularly banded with individual color combinations on their breeding grounds and collection of band re-sights allow for determining dispersal from breeding to wintering grounds. DRP staff monitor all shorebird, seabird, raptor, or wading bird species observed during surveys conducted twice a month during the winter months (September to February) and weekly during the breeding season (February to August).

Choctawhatchee beach mice are monitored for presence or absence and relative distribution through tube tracking surveys on Shell Island. Tubes should also be added to the mainland. These tubes determine presence, absence and relative distribution but have an advantage of not being dependent on sand tracking conditions. The park will continue to work with FWC to monitor these tubes periodically. Currently, the tubes are monitored monthly. Research of the beach dune community and its response after tropical storms is important for understanding baseline conditions and succession of dune community after storms.

Once every three years, the entire park will be surveyed for gopher tortoise burrows and mapped. Tortoise surveys will follow established FWC protocols to determine the number of occupied and potentially occupied burrows present at the park. Additionally, opportunistic burrow or live tortoise observations will be recorded (e.g., following prescribed burning).

Annually, in collaboration with the University of Florida, beach dune habitat should be monitored for solitary bees. The distribution of yellow buttons and bees should be documented and mapped. Solitary bees are present whenever the yellow buttons are in bloom. Timing varies each year, but blooming typically occurs between August and October. Detailed monitoring protocol should be developed.

**Objective C: Monitor and document 2 selected imperiled plant species in the park.**

- Action 1      Develop monitoring protocols for 2 selected imperiled animal species including Godfrey's goldenaster and Cruise's goldenaster.
- Action 2      Implement monitoring protocols for 2 imperiled plant species including those listed in Action 1 above.

Both the Godfrey's and Cruise's goldenaster are specific to the beach dune and coastal scrub natural communities. With coastal development degrading habitat all along the Gulf of Mexico, the state parks are some of the only refuges left for these imperiled plants.

Once every three years, the total population of each species will be calculated and mapped. This will allow staff to document population growth as well as decline. If populations appear to be declining rapidly, staff will coordinate actions with appropriate FWC and USFWS personnel. Every year, staff will conduct presence/absence surveys with predetermined transects within the park. While these less detailed surveys won't provide complete population numbers, they will ensure that the plants are still persisting within the park's boundary.

**Objective D: Prevent disturbance to nesting and wintering shorebirds**

- Action 1      Post, rope, and maintain shorebird nesting habitat annually prior to the start of the nesting season.
- Action 2      Post, rope, and maintain shorebird brood-rearing habitat, when feasible.
- Action 3      Post, rope, and maintain seasonal winter locations for roosting shorebirds in locations that overlap with visitor access.
- Action 4      Work with partners to minimize beach driving and provide outreach/training to staff and others in accordance with FWC's beach driving best management practices.
- Action 5      Work with partners on interpretive programs aimed at educating and informing park visitors about shorebirds.

The park should post and rope suitable shorebird areas annually prior to the start of the nesting season to prevent visitor disturbance to breeding shorebird and with the goal of increasing shorebird abundance and diversity at the park. Posting should follow the guidelines established by FWC (Avisar et al. 2012). Protection of nesting habitat with symbolic fencing increases occurrence of nesting, abundance of nesting shorebirds and productivity (Pruner 2010). Protection efforts during the winter month should focus on protecting locations where high densities of roosting and foraging imperiled shorebirds occur.

The DRP will coordinate with the partners on interpretive programs aimed and educating and informing park visitors about shorebirds and the potential impacts recreation can have on nesting and foraging activities (e.g., beach stewarding program). Training for park staff by district biologist many also be necessary to ensure that all staff know more about shorebirds at the park.

Driving on the beach should be limited as much as possible year-round and when driving does occur it should follow the guidelines in the FWC *Best Management Practices for Operating Vehicles on the Beach* (FWC BMPs).

***Objective E: Work with the USFWS and FWC to reintroduce/augment the Choctawhatchee beach mice population with the mainland park boundary.***

- Action 1 Work with appropriate partners to assess beach habitat and add beach mice to the St. Andrews State Park mainland.
- Action 2 Work with appropriate partners to trap mice within St. Andrews State Park-Shell Island to translocate them to the mainland.
- Action 3 Work with appropriate partners to monitor the mainland population, including plans for future translocation events if deemed necessary for population persistence.

Beach mice naturally persist through local extirpations due to storm events of the harsh, stochastic nature of coastal ecosystems. Historically, areas like the park mainland would be recolonized as population densities increased and dispersal occurred from adjacent populated areas. However, as residential and commercial development continues to fragment the coastal dune landscape, beach mice are no longer capable of recolonizing these areas as they did in the past (Holliman 1983). Therefore, natural recolonization of the mainland is extremely low.

The park will work closely with FWC and USFWS to reintroduce Choctawhatchee beach mice to the mainland. All translocated beach mice should come from Shell Island to effectively reestablish the connectivity for the population between Shell Island and the mainland prior to the creation of the St. Andrew channel. If beach mice are successfully reintroduced to the mainland, monitoring efforts will follow those established by FWC and the USFWS (see above under imperiled species). Once established, the mainland population should be closely monitored and if the population levels decline, augmentation efforts from Shell Island may be necessary. Checking and controlling for the presence of predators should be part of monitoring and management following reintroduction of beach mice to the mainland.

***Objective F: Reduce disturbance to American alligators***

- Action 1 Determine current impacts to American alligators at the park, including identifying the primary locations where alligators and park visitors overlap.
- Action 2 Design interpretive kiosks aimed at improving park visitor awareness related to alligators.

Visitors should be educated on the dangers of feeding or bothering alligators in terms of harm to both the alligator and visitor. Interpretive signs such as information kiosks should be placed in areas where visitors are most likely to encounter alligators. Kiosks should include information on the impacts of feeding wildlife and the fate alligators face once they become habituated.

## **Exotic Species Management**

**Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.**

The DRP actively removes invasive exotic species from state parks, with priority being given to those causing the ecological damage. Removal techniques may include mechanical treatment, herbicides or biocontrol agents.

**Objective A: Annually treat 4.9 acres of exotic plant species in the park.**

- Action 1      Annually develop/update exotic plant management work plan.
- Action 2      Implement annual work plan by treating 4.9 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.

Over the past few years, in an effort to control exotic plants, park staff has herbicidally treated all known exotics. Herbicide will be applied to all exotics until they are no longer observed and/or the infestation is in maintenance condition. Areas of known exotics will be checked annually and treated with herbicides as necessary until the areas are in maintenance condition. Park and district staff will also continue to look for additional locations where exotic species may become present. Maintenance condition describes a formerly active infestation that has been treated to the extent that any plants remaining are manageable with existing staff and resources, total area is stable or declining, mature reproducing individuals are absent, and the species poses no significant threat to listed plants or animals. Thus, the actual treated zone may reduce in area over time though the entire extent would need to be inspected indefinitely.

Many of the exotic plants observed at the park occur along the northern park boundary on the mainland. The park will need to work with the residents and adjacent development on removing or minimizing the presence of exotics on the park boundary. In addition to working with adjacent land owners on the current exotic issue, the park should provide the residents with information on using native plants for landscaping to minimize the occurrence of exotics in the area.

***Objective B: Implement control measures on 4 exotic and nuisance animal species in the park.***

- Action 1      Work with USDA to continually reduce coyote, feral cat, red fox and armadillo populations at St. Andrews State Park.

The park should continue a control program for coyotes, red foxes, feral cats, and armadillos. All of these species are threats to imperiled coastal species. Pruner et al. (2011) found that the more coyotes removed, the higher the probability of hatching success for shorebird nests. A tracking assessment of exotic animal predator species should be conducted prior to the start of the shorebird nesting season and during beach mice, shorebird and sea turtle monitoring to establish predator control needs. In addition, any documented predation event (e.g., shorebird nest, sea turtle nest) should be reported to the district office to

coordinate predator removal efforts with the USDA. Coordinated efforts between the FWC, USFWS, and DRP associated with the Deepwater Horizon oil spill will adequately fund the predator removal program with the USDA at this park until 2017. Continual funding will be required to maintain breeding populations of listed species at the park.

Feral cats are another exotic animal that continues to be an issue on the mainland of St. Andrews State Park. The park staff will work closely with the USDA on trapping efforts. The park will follow the DRP's Resource Management Standard for Nuisance and Exotic Animal Removal. The DRP will coordinate with the USFWS and FWC on an education and outreach program aimed at the public (park visitors and neighboring communities) on the impacts feral cats have on wildlife.

Armadillos are much harder to trap than any other exotic animal. Because these animals cannot be easily drawn into a trap with bait, traps with wooded funnels can be used to guide the animal into the trap. Armadillos are increasingly becoming a concern on Shell Island, in terms of dune vegetation disturbance and shorebird nest depredation. Armadillos are currently removed opportunistically by USDA, but as the predator communities shift, they may become a main threat in the future and more of a priority for USDA removal.

### **Cultural Resource Management**

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. The DRP will implement the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in St. Andrews State Park.

#### **Goal: Protect, preserve and maintain the cultural resources of the park.**

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places must be submitted to the FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, pre-testing of the project site by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing

to construct a new or replacement building. This comparison must be accomplished with the assistance of the DHR.

***Objective A: Assess and evaluate 6 of 8 recorded cultural resources in the park.***

- Action 1 Complete 6 assessments/evaluations of archaeological sites.
- Action 2 Complete 18 Historic Structures Reports (HSRs) for historic buildings and cultural landscape. Prioritize stabilization, restoration, and rehabilitation projects.

The park will assess 6 of the 8 known sites within the park every other year. The site condition will be evaluated and any threats examined. Site 8BY13412 will be reassessed and reevaluated as natural forces uncover the site, making it once again accessible. Site 8BY13412 was only visible following tropical storm activity and only for a short period of time before it was covered with accreting sand.

The 6 assessments will include examination of each site with discussion of any threats to site conditions, such as natural erosion; vehicular damage; pedestrian damage; looting; construction, including damage from fire break construction; animal damage; plant or root damage or other factors which might cause deterioration of the site. Staff will set up and use photo points at each site to evaluate changes of the site from previous assessments. Management measures will be prioritized after assessments to determine management needs for each site.

There are currently no needs to stabilize or restore any of the sites at the park. Located on a small barrier island, the only imminent danger to this site is storm surge from a hurricane or bayside erosion. In the event of a large storm event, park staff will not be required to take any action prior to a storm regarding the cultural sites at the park. Staff should evaluate the site post storm to document any artifacts that may have emerged, midden loss, etc.

***Objective B: Compile reliable documentation for all recorded historic and archaeological resources.***

- Action 1 Ensure all known sites are recorded or updated in the FMSF.
- Action 2 Develop and adopt a Scope of Collections Statement.
- Action 3 Conduct oral history interviews.
- Action 4 Compile a park administrative history.
- Action 5 Conduct Level 1 archaeological survey for 1 priority areas identified by predictive model.

St. Andrews State Park was included in the 2011 Archaeological Resource Sensitivity Modeling conducted by the University of South Florida, Alliance for Integrated Spatial Technologies. No new archaeological sites were identified at the park during this study. However, greater than 52% of the park was identified as having a high sensitivity for archaeological site locations. A Level I survey should be conducted on priority sites at the park as identified by the predictive model so they can be evaluated by the State Historic Preservation Officer (SHPO) for National Register eligibility. Because many of the cultural sites are eroding, surveys beyond



Level 1 should be considered at several of the sites, including 8BY87, 8BY86, and 8BY789. This should include sub-surface testing, including post-hole testing to help identify site boundaries, vertical limits of sites, and identification of additional cultural and natural materials associated with the site that may not be currently recorded for the site. Priority should be placed on BY86 because it is exposed to coastal erosion and at greater risk of potential visitor collection than the other sites in the area.

Park staff will update the park's data in the FMSF as new archaeological sites are discovered, or new information on currently recorded sites is revealed via assessments/ evaluations or approved archaeological investigation.

Efforts should be made to interview those who originally discovered the cultural sites at the park, including Louis Tesar, Jim Haisten, Debra Walker, and staff who have worked or volunteered at the park for many years. These individuals may be able to provide accounts of the role and history of the Florida Park Service at St. Andrews State Park in addition to information on the identified cultural sites.

Currently, there is not a scope of collections and records are missing and/or unorganized. In cooperation with the Florida Bureau of Archaeological Research, the park should develop and adopt a procedure for accepting artifacts and other probable cultural materials recovered and turned over by visitors and for forwarding them to the Bureau.

***Objective C: Bring 3 of 8 recorded cultural resources into good condition.***

- Action 1 Design and implement regular monitoring programs for 6 cultural sites.
- Action 2 Create and implement a cyclical maintenance program for each cultural resource.
- Action 3 Coordinate with partners such as DHR to assess cultural sites impacted by eroding shorelines and develop stabilization/restoration plans if deemed necessary.

The park should create and implement a cyclical maintenance and monitoring program for six cultural resource, monitoring each site at least once annually. Maintenance of the cultural resources at the park ranges from potentially clearing vegetation to monitoring for unauthorized collection. All sites should be monitored for damage from storms, human disturbance, vehicular traffic, heavy equipment use, unauthorized collection, and any other ground disturbance. Ground disturbance anywhere in the park should be carefully examined for the presence of artifacts and features, and any new sites or site boundaries properly documented.

Stabilization is needed for 8BY170 cultural site at the park. Unfortunately, stabilization may be impossible as the site is already critically eroded and partially submerged. Most of the site is already underwater or subject to storm surge. This site should be a priority for additional level 1 archaeological surveys before the site becomes entirely eroded or submerged.

The next priority for documentation and possibly stabilization is 8BY86 as it is eroding, but much of the site remains intact. The site should continue to be routinely monitored as it is near a popularly visited area of the park. Its vertical integrity has been disturbed by erosion. It is vulnerable to storm surge.

The Shell Island Mound site (8BY798) should be a priority for further surveys before it is looted and/or altered further by park visitors. The integrity of the site is threatened and should be closely monitored and protected as part of the annual monitoring cycle.

The Spanish Ante Point site (8BY87) is in good condition and is rarely visited by park visitors due to its remote location. The area should be reassessed and possibly separated into two sites, one that represents the prehistoric component and one that represents the historic 18<sup>th</sup> century findings. Based on current literature reviews, little no information was gathered on the historic site.

The 1942 WWII gun mount #1 (8BY1341) is in good condition. This site is heavily visited by park visitors; however, it is protected by a pavilion and interpretation display. Regular monitoring should include checking the area for vandalism and degradation of the coastal environment. The Friends of St. Andrews are pursuing listing the gun mount with the Nation Register of Historical Sites.

The 1942 WWII gun mount #2 (8BY1342) is in good condition. This site is protected from potential damages by sand burial. Annual monitoring should occur at the site to check for exposure. Any time that the gun mount becomes exposed, its condition should be reassessed. The Friends of St. Andrews is pursuing listing the gun mount under the National Register of Historical Sites.

The park should consult with DHR and BNCR for guidance, assessing, planning, and designs the management of these site with potential stabilization techniques.

## **Special Management Considerations**

### **Timber Management Analysis**

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the DRP's statutory responsibilities and an analysis of the park's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

During the development of this plan, an analysis was made regarding the feasibility of timber management activities in the park. It was determined that the primary

management objectives of the unit could be met without conducting timber management activities for this management plan cycle. Timber management will be re-evaluated during the next revision of the management plan.

### **Coastal/Beach Management**

The DRP manages over 100 miles of sandy beach, which represents one-eighth of Florida's total sandy beach shoreline. Approximately one-quarter of Florida's state parks are beach-oriented parks and account for more than 60 percent of statewide park visitation. The management and maintenance of beaches and their associated systems and processes is complicated by the presence of inlets and various structures (jetties, groins, breakwaters) all along the coast. As a result, beach restoration and nourishment have become increasingly necessary and costly procedures for protecting valuable infrastructure. Beach and inlet management practices affect beaches for long distances on either side of a particular project. DRP staff needs to be aware of and participate in the planning, design and implementation of these projects to ensure that park resources and recreational use are adequately considered and protected.

St. Andrews State Park encompasses 6 miles of beach, approximately 2.1 miles on the mainland and another 3.9 miles on Shell Island. The beach habitat at the park is protected under the Coastal Barrier Resources Act (CBRA). The CBRA helps ensure that the coastal habitat remains intact by minimizing the likelihood of development on this sensitive and dynamic habitat.

As identified in the Resource Management Program, dune restoration may be needed after tropical storms, and dunes should be assessed after each storm to determine the need. In 2006, over 434,000 sea oats and other dune species were planted along the foredune area to restore the dunes that were eroded from tropical storm damage in 2004 and 2005. Most of the plantings have accelerated foredune growth, thus protecting larger more stable back dunes. Other areas were eroded by high surf, creating dune pockets which provide ideal habitat for nesting shorebirds.

As part of the effort to implement the goal of restoring and maintaining the natural communities and habitats of the state park, the following special management objectives for coastal systems are recommended.

***Objective: Continue to partner with federal, state and local agencies to fund, design, permit, improve and maintain coastal and beach management programs consistent with the mission of the DRP.***

St. Andrews State Park is currently the recipient site for dredge spoil deposits as part of the St. Andrew channel maintenance by the USACE. The section of beach along the northwest section of the channel, in front of Gator Lake, is considered critically eroding by DEP's Bureau of Beaches and Coastal Systems (2014). The dredge sediments are from the channel help maintain the eroding shoreline at the park. Although the amount of material varies each dredging event, a plan should be

in place to minimize the impacts to coastal wildlife including shorebirds. Specifically, dredged material should avoid placement on or near shorebird nesting habitat to prevent impacting the habitat and the prey base in the area.

### **Arthropod Control Plan**

All DRP lands are designated as “environmentally sensitive and biologically highly productive” in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, the DRP works with the local mosquito control district to achieve consensus. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor’s Emergency Proclamation.

The park currently has an arthropod plan for the mainland portion of St. Andrews State Park only. The park is sampled prior to any mosquito control efforts. Surveillance at the park is completed by using landing rate counts, citizen complaints, light traps, and by dip-netting for larval mosquitoes. Once mosquitoes are detected, monitoring and surveillance efforts continue in order to determine mosquito prevalence, abundance, and the effects of control activities on target and non-target species. Depending on the severity of the mosquito problem, mosquitoes will be controlled with ground or aerial spraying of wetland areas. In addition, predacious fish may be stocked to use as a biological control. Normal range mosquitoes are controlled via ground-based fogging around the developed areas of the campground, around the park staff residences and at the youth camp based on requests from the park staff. It is recommended that fogging not take place during high winds to prevent fog from effecting adjacent conservation areas. After heavy rains that leave significant standing water, retention areas between campsites are treated by hand and/or aerial larvicide is applied to all ephemerally flooded areas. This excludes the Buttonbush Marsh. The current arthropod plan will need updated to include discussion of imperiled invertebrates found at the park.

### **Sea Level Rise**

Potential sea level rise is now under study and will be addressed by Florida’s residents and governments in the future. The DRP will stay current on existing research and predictive models, in coordination with other DEP programs and federal, state, and local agencies. The DRP will continue to observe and document the changes that occur to the park’s shorelines, natural features, imperiled species populations, and cultural resources. This ongoing data collection and analysis will inform the Division’s adaptive management response to future conditions, including the effects of sea level rise, as they develop.

## **Resource Management Schedule**

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan.

## **Land Management Review**

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation, and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The considered recommendations of the land management review team and updated this plan accordingly.

St. Andrews State Park was subject to a land management review on April 28, 2014. The review team made the following determinations:

- The land is being managed for the purpose for which it was acquired.
- The actual management practices, including public access, complied with the management plan for this site.



## **LAND USE COMPONENT**

### **Introduction**

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management. Additional input is received through public workshops, and through environmental and recreational-user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are expressed in general terms.

### **External Conditions**

An assessment of conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities.

St. Andrews State Park is located within Bay County about 8 miles southeast of the center of Panama City Beach, 13 miles south of Panama City, and 38 miles east of Santa Rosa Beach in the northwest part of the state. Approximately 194,000 people live within 30 miles of the park (U.S. Census 2010).

The population of Bay County is demographically diverse. According to the U.S. Census Data (2013), approximately 23% of residents in the county identify as black, Hispanic or Latino, or another minority group. Nearly half (46%) of residents can be described as youth or seniors (U.S. Census 2010) and 67% of the population is of working age (16 to 65) (U.S. Census Bureau 2010). Bay County ranked 23<sup>rd</sup> statewide in per capita personal income at \$37,915 (below the statewide average of \$41,497) (U.S. Bureau of Economic Analysis 2013).

A significant amount of resource-based recreation opportunities exist within 15 miles of St. Andrews State Park. Panama City Beach Conservation Park is a city-owned conservation and interpretive area providing 24 miles of trails and over a mile of boardwalks through cypress domes. City of Panama City Beach also offers the Russell Fields City Pier, which extends 150 feet over the Gulf. The adjacent City Beach is a public recreation beach with seasonal lifeguards on duty. Owned by the Bay County Conservancy (BCC), the Audubon Nature Preserve and Mary Ola Reynolds Miller Palm Preserve offer picnicking, wildlife viewing, and nature trails nearby within the City of Panama City. City of Panama City additionally offers Oaks by the Bay Park in the historic waterfront community of St. Andrews. Bay County offers 42 public beach access points throughout the county, including the Gulf, St. Andrew Bay, and Lake Powell.

The Florida Circumnavigational Saltwater Paddling Trail, or the CT, spans 1,515 miles along Florida's coast, from Pensacola to Fort Clinch. Segment 3, a 63-mile link from Grayton Beach State Park to St. Joseph Peninsula State Park, runs through St. Andrews Aquatic Preserve. St. Andrews State Park campground is a specified overnight area along the trail.

The park is located in the Central Vacation Region, which includes Bay, Calhoun, Escambia, Franklin, Gulf, Holmes, Jackson, Liberty, Okaloosa, Santa Rosa, Walton, and Washington counties (Visit Florida 2013). According to the 2013 Florida Visitor Survey, approximately 12.5% of domestic visitors to Florida visited this region. Roughly, 95% visitors to the region traveled to the Northwest for leisure purposes. The top activities for domestic visitors were beach/waterfront and culinary/dining experience. Summer was the most popular travel season, but visitation was generally spread throughout the year. Most visitors traveled by non-air (95%), reporting an average stay of 4 nights and spending an average of \$135 per person per day (Visit Florida 2013).

Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) indicates that participation rates in this region for freshwater beach activities, saltwater non-boat fishing, freshwater boat fishing, freshwater boat-ramp use, hiking, RV/trailer camping, and hunting are higher than the state average with demand for additional facilities increasing through 2020 (FDEP 2013).

### **Existing Use of Adjacent Lands**

Land adjacent to the mainland of St. Andrews State Park is dominated by seasonal resorts and commercial uses. On the bay side, there is a neighborhood of manufactured houses and duplexes. On the coast, high-rise resorts front the Gulf of Mexico. The park is bound on the north by St. Andrew Bay and on the south by the Gulf of Mexico. North of the bay, land serves resort and residential uses. Tyndall Air Force Base shares a property line with the park on the east end of Shell Island. Thomas Drive (SR 392) leads into the park entrance and is lined with restaurants and resorts geared towards beach visitors.



## **Planned Use of Adjacent Lands**

Adjacent properties to the mainland are zoned and designated for seasonal and resort uses (S/R) allowing no more than 15 dwelling units per acre. Seasonal/resort land is not intended for year-round permanent residents. Instead, adjacent land serves seasonal or temporary visitors and tourists. Tyndall Air Force Base is identified as a public and institutional land use category to provide areas for public and institutional buildings and facilities. Land across the bay is also specified for seasonal and resort uses, as well as supporting recreational and general commercial areas. The park and surrounding land fall within the Military Influence Overlay District and beach special treatment zones, which impose special regulations if necessary. There are no planned infrastructure projects or other major developments that would affect the park or adjacent land.

According to the 2010 Census, Bay County's population increased by 12% from the 2000 Census population. The County's coastal location and favorable weather serves as a draw for increasing numbers of visitors and retirees. Bay County is anticipating a population over 173,000 by 2040 (BEBR 2014). However, while the surrounding area is expected to grow with the region's popularity as a tourist destination, the pace of growth is likely to fluctuate with the overall economic climate.

The West Florida Regional Planning Council (WFRPC) reported that a majority of the region's growth is expected in Bay County in the next thirty years largely due to the county's military and research presence. The recent development of the Northwest Florida Beaches International Airport has also spurred economic development in the area.

## **Property Analysis**

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

### **Recreation Resource Elements**

This section assesses the park's recreational resource elements, those physical qualities that, either singly or in certain combinations, can support various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support potential recreational activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

## **Land Area**

St. Andrews State Park contains 14 natural communities, which provide an ideal setting for resource-based recreation and interpretation. Three primary use areas and a standard facility campground are developed for public recreation. The campground, marina, trails, and turpentine still interpretive site are situated in the scenic mesic flatwoods of the park. Gulf beach access as well as additional nature trails are provided in the park's dune and coastal scrub communities. These coastal community types are readily accessible for recreational and educational purposes. Shell Island is a 690-acre undeveloped barrier island, accessible only by boat, with diverse community types, including maritime hammock, coastal dune lake, and extensive beach dune. The island is ideal for wildlife viewing and secluded beach recreation.

## **Water Area**

St. Andrews State Park does not include a submerged boundary beyond the mean high waterline; however, its extensive shorelines provide ideal access to the waters of Grand Lagoon, St. Andrew Bay, and the Gulf of Mexico for boating, fishing, and swimming. The Army Corps of Engineers manages the two jetty structures, which extend from the park's beaches through the St. Andrew Bay navigation channel. These jetties attract many visitors for fishing and diving the waters adjacent to the park.

## **Shoreline**

The most renowned recreational resources of the park are its shorelines along Grand Lagoon, St. Andrew Bay, and the Gulf of Mexico. Combined, these shorelines amount to approximately 68,800 feet, or about 13 miles. The park provides roughly 4.6 miles of Gulf beach, which is the primary draw for visitors. Shell Island contains roughly three quarters of the park's Gulf beach. Access to the island is by the park's concessionaires and private recreational vessels.

## **Natural Scenery**

The perimeter of the park offers open vistas over the Gulf of Mexico, St. Andrew Bay, and Grand Lagoon, whereas the interior of the park's mainland portion offers scenic views of the Buttonbush Marsh and Gator Lake. Scenery on the mainland is also remarkable for its 44 acres of beach dune. Shell Island's undeveloped landscape forms a scenic backdrop for visitors looking across the pass from the mainland. Shell Island, itself, offers uninterrupted viewsheds of white sand beach and coastal grassland, while the bay side of Shell Island offers scenic views of an intricate estuarine shoreline.

## **Significant Habitat**

As the last remnants of barrier island natural communities in the region, all undeveloped portions of the park provide unique opportunity for viewing and interpreting wildlife. From the perimeter of the basin marshes, visitors may observe alligators and a variety of wading birds. Gator Lake is home to a great blue heron rookery that is visible from the overlook. Birdwatchers find shorebirds, including such listed species as piping plovers, snowy plovers, and least terns, which nest and forage on Shell Island. From viewing points adjacent

to the beach dune community, visitors may glimpse the federally listed Choctawhatchee beach mouse. Shorelines provide opportunity to sight loggerhead and green sea turtles in the waters adjacent to the park.

### **Natural Features**

Outstanding natural features of the park for purposes of recreation, wildlife observation and nature study, and opportunities for solitude, are provided in its various beach and waterfront areas, coastal scrub, and basin marsh communities on the mainland, and the entire undeveloped landscape of Shell Island. An unnamed coastal dune lake is also located on Shell Island.

### **Archaeological and Historic Features**

The five known cultural sites on the property include prehistoric shell middens, village sites, and historic Spanish Period refuse sites, which offer opportunity to interpret the pre-Columbian and colonial histories of St. Andrew Bay and the Emerald Coast. Opportunity for interpretation of modern history is also found in the park as several structures remain from WWII, when the property was used by a coastal artillery unit. Two gun placements were located on the dunes. The remains of one serve as the foundation for a pavilion in the Jetty Use Area. Another placement is periodically exposed by erosion on the beach shoreline. Barracks and a mess hall building have been adaptively reused for administrative offices and a training center. On the lagoon side of the park, a reconstructed turpentine still provides a unique opportunity to learn about the American Naval Stores industry.

### **Florida Greenways and Trails System (FGTS)**

The Florida Greenways and Trails System (FGTS) is made up of existing, planned and conceptual non-motorized trails and ecological greenways that form a connected, integrated statewide network. The FGTS serves as a green infrastructure plan for Florida, tying together the greenways and trails plans and planning activities of communities, agencies and non-profit organizations throughout Florida. Trails include paddling, hiking, biking, multi-use, and equestrian trails. The Office of Greenways and Trails maintains a priority trails map and gap analysis for the FGTS to focus attention and resources on closing key gaps in the system.

In some cases, existing or planned priority trails run through or are adjacent to state parks, or they may be in close proximity and can be connected by a spur trail. State parks can often serve as trailheads, points-of-interest, and offer amenities such as camping, showers and laundry, providing valuable services for trail users while increasing state park visitation.

St. Andrews State Park is identified along the Great Northwest Coastal Connector Corridor. This land-based corridor will connect the entirety of the Florida Panhandle along the Gulf Coast using greenways and trails. Additionally, the park serves as a hub on the Florida Circumnavigational Saltwater Paddling Trail, a prioritized paddling trail on the 2012 Priority Trails Map. The park hosts

overnight paddlers at designated campsites and is an entry point for an alternate route along the Intracoastal Waterway.

### **Assessment of Use**

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

#### **Past Uses**

The St. Andrew Bay shipping channel that separates Shell Island from the mainland was dredged by the U.S. Army Corps of Engineers in the mid-1930s. During World War II, a coastal artillery unit occupied this location as the St. Andrews Military Reservation. The shorelines of the park have also been popular destinations among recreational beachgoers and boaters since the early 20<sup>th</sup> Century. Captain Anderson began ferrying visitors to Shell Island in the 1940s. Shell Island was the location of the Hurricane Club, a private beachfront social club, which burned down in an accidental fire prior to state acquisition. Adjacent to the Hurricane Club was a small zoo, located on Spanish Ante Point. Remnants of the zoo have been removed as part of resource management and habitat restoration on the island.

#### **Future Land Use and Zoning**

The DRP works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes and permit typical state park uses and facilities necessary for the provision of resource-based recreation.

The majority of the park is zoned and designated for conservation and recreation (CSVR), which allows no more than one dwelling per 20 acres to protect a balance between conservation and recreational uses. Land to the northwest of the mainland shares the same future land use designation but is zoned for recreation (REC). Recreation designations allow for active and passive recreational activities. Currently, that portion of the park contains the day use areas and campground. On Shell Island, land is predominantly zoned and designated for conservation and recreation. However, the eastern portion of the island, near the Spanish Ante subdivision and Tyndall Air Force Base, is zoned and designated for public/institutional (P/I) uses. Public/institutional land accommodates public and institutional buildings and facilities. The future land use categories identified for St. Andrews State Park are consistent with existing zoning regulations. There are no expected conflicts between the future land use or zoning designations and typical state park land uses.

#### **Current Recreational Use and Visitor Programs**

Resource-based outdoor recreation in Florida continually increases in popularity. The growth of Florida's resident and tourist populations brings increasing pressure for access that is more widespread and for denser levels of public use in the natural areas available to the public. Consequently, one of the greatest challenges for public land management today is the balancing of reasonable

levels of public access with the need to preserve and enhance the natural and cultural resources of the protected landscapes.

St. Andrews State Park offers a broad range of recreational and interpretive opportunities. Regionally the park is significant for the barrier island habitat that it preserves, which draws many visitors interested in birding and wildlife viewing. Accordingly, the park is part of the Great Florida Birding and Wildlife Trail. The park is also an increasingly popular access point for scuba diving along the rocks of the east and west jetties. Soft coral and anemones on the structure attract large congregations of fish, which in turn attract recreational divers. Ease of access from the park beach draws frequent visitors to the Jetty Use Area. Likewise, the Jetty Beach and Sandy Point are popular among shoreline anglers. Fishing is also popular from the park's Gulf Pier, which extends more than 400 feet over the Gulf of Mexico. General beach recreation activities, including swimming, shelling, and sunbathing are popular along the entire Gulf shoreline of the park. The park's shoreline along St. Andrew Bay is most popularly used for shoreline fishing and nature viewing.

Special events are held at the park throughout the year. Annual events include National Public Lands Day, First Day Hike, Junior Ranger Day, Ironman Triathlon, FWC Women's Fishing Clinic, and more than 15 5K/10K foot races. Numerous outdoor interpretive programs are frequently scheduled upon request by school groups and local organizations.

St. Andrews State Park recorded 1,011,837 visitors in FY 2014/2015. By DRP estimates, the FY 2014/2015 visitors contributed more than \$88 million in direct economic impact, the equivalent of adding 1,408 jobs to the local economy (FDEP 2015). The park's visitation and estimated economic impacts are the highest among all parks within the Northwest District (District 1).

### **Other Uses**

The DRP District 1 administrative headquarters is located at the park. FWC also has a dedicated office space at the park. A U.S. Navy communications facility is located outside the park entrance station, immediately adjacent to the northwestern park boundary.

### **Existing Facilities**

Four main public use areas and three support areas make up the developed zones of the mainland parcel of St. Andrews State Park. The park entrance station, environmental interpretive center, and park office are located just inside the western boundary. A paved park road loops through the park and provides access to the main use areas. Two short nature trails offer hiking opportunities and two boardwalks overlook the basin marsh, wet flatwoods, and maritime hammock communities.

The Jetty and Gulf Pier use areas provide beach access on the mainland parcel with covered shelters, restrooms, concessions, and a long fishing pier extending over the Gulf of Mexico. Concession and restroom facilities at the Jetty Use Area

were renovated in 2003. In 2014, the Gulf Pier Use Area underwent renovation as its parking lot was reconfigured and concession and restroom facilities were reconstructed to separate it from the beach dunes.

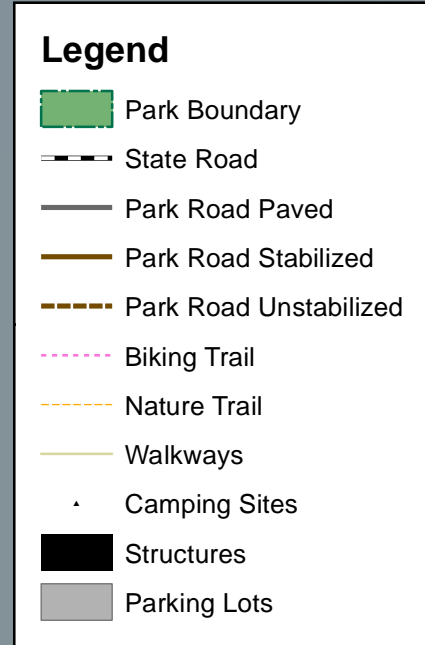
Access to Grand Lagoon and the waters of St. Andrew Bay is available at the Lagoon Use Area, which includes a boat ramp, fishing pier, picnic facilities, and restroom. Overflow boat trailer parking is provided in a nearby stabilized area. The boat rental and Shell Island tour concessionaire operates from a booth in this area. A boat dock adjacent to the fishing pier is the launching point for concession tours to Shell Island from inside the park. A shuttle service collects visitors from the two beach use area parking lots and takes them to this boat dock for transport to Shell Island.

The reconstructed turpentine still is located adjacent to the picnic area. An open-air classroom with bench seating is located nearby to support park interpretive programming. Near the Lagoon Use Area, a concession store is situated at the three-way intersection of the park road, providing supplies for boaters and campers.

The campground, located along the shoreline of Grand Lagoon, consists of the Lagoon and Pine Grove loops and contains 176 sites and 4 bathhouses. A more primitive camping experience is available at the park's group camp located in the southwest corner of the mainland parcel near Sandy Point.

There are currently three user agreements with private operators that provide tours to Shell Island, with two designated landing areas managed by the park. One is located just inside the east jetty along the channel and is used by the park concessionaire. A second landing area is located further east at Spanish Ante Point on the bay side of the island. Two docks are linked by a boardwalk that provides access to the beach at this location. The Shell Island portion of the park is otherwise undeveloped.

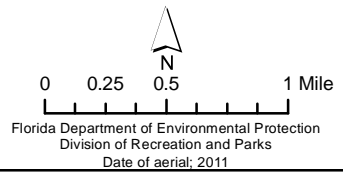
Park residences and maintenance facilities are located off the park road west of the Lagoon Use Area and south of the campground. District 1 administrative offices and a small FWC office, as well as additional residences are located in the southeast corner of the park in the vicinity of Gator Lake (see Base Map).



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ST. ANDREWS STATE PARK



BASE MAP





## **Recreation Facilities**

### **Entrance Area**

Entrance station  
Park office/camper registration  
Environmental Interpretive Center  
Small parking areas (2)

### **Gulf Pier Use Area**

Fishing pier (440 ft.)  
Beach access path  
Picnic pavilions (3)  
Paved parking (210 standard + 13 oversized spaces)  
Concession store  
Restrooms (2)  
Outside shower  
Interpretive kiosk (1)

### **Jetty Use Area**

Picnic pavilions (3)  
Gun mount pavilion  
Concession store  
Restrooms (2)  
Outside showers  
Dune crossover boardwalks (3)  
Beach overlook  
Interpretive signs (4)  
Paved parking (340 standard spaces)

### **Lagoon Use Area**

Boat ramp and basin  
Fishing pier (125 ft.)  
Tour boat dock  
Restroom (1)  
Playground

## **Support Facilities**

### **Maintenance Area**

Standard two-bay shop  
Flammable storage building  
Equipment shelter

### **Staff Residences**

Standard residences (3)

Grills (5)  
Tables (5)  
Turpentine still interpretive site  
Paved parking (28 standard + 18 oversized)  
Overflow parking (50 vehicles with trailers)  
Concession store

### **Interpretive Areas and Trails**

Gator Lake Interpretive Area  
Gator Lake overlook  
Interpretive panel (1)  
Paved roadside parking (3 spaces)  
Gator Lake Trail (0.6 mile)  
Heron Pond Trail (1 mile)

Buttonbush Marsh Interpretive Area  
Buttonbush Marsh overlook  
Interpretive panel (1)  
Paved roadside parking (3 spaces)

### **Camping Areas**

*Lagoon and Pine Grove Loops*  
Standard campsites (176)  
Bathhouses (4)  
Playground  
Dump stations (2)  
*Group Camp*  
Composting restroom and shower  
Potable water

### **Shell Island**

Boat docks (2)  
Boardwalk (1)  
West End boat landing site

### **Administrative Area**

District 1 offices  
Training/Conference Center  
FWC office  
District 1 two-bay shop and storage  
Radio tower

## Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan is the long-term, optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting (see Conceptual Land Use Plan). The conceptual land use plan is modified or amended, as new information becomes available regarding the park's natural and cultural resources or trends in recreational uses, in order to adapt to changing conditions. Additionally, the acquisition of new parkland may provide opportunities for alternative or expanded land uses. The DRP develops a detailed development plan for the park and a site plan for specific facilities based on this conceptual land use plan, as funding becomes available.

During the development of the conceptual land use plan, the DRP assessed the potential impact of proposed uses or development on the park resources and applied that analysis to determine the future physical plan of the park as well as the scale and character of proposed development. Potential resource impacts are also identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are investigated in greater detail. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Creation of impervious surfaces is minimized to the greatest extent feasible in order to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state and local permit and regulatory requirements are addressed during facility development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels.

### **Potential Uses**

#### **Public Access and Recreational Opportunities**

**Goal: Provide public access and recreational opportunities in the park.**

The existing recreational activities and programs of this state park are appropriate to the natural and cultural resources contained in the park and should be continued. New and improved activities and programs are also recommended and discussed below.

***Objective: Maintain the park's current recreational carrying capacity of 6,860 users per day.***

The park will continue to provide opportunities for beach access, shoreline fishing, boating, paddling, camping, picnicking, hiking, bicycling, and nature



**Campground Area**  
Campground Improvements  
Erosion Control

**Entrance Area Improvements**  
Redesign Park Entrance  
New Ranger Station

**Lagoon Use Area**  
Dock Repairs  
Relocate Concessions  
Add Pavilions  
Small Restroom  
Canoe/Kayak Launch  
Intersection Improvements  
Redesign Parking  
Relocate Environmental  
Interpretive Center





**Gulf Pier Use Area**  
Awning and Interpretive  
Panels at Shuttle Stop

**Buttonbush Marsh**  
Loop Trail  
Overlooks

**Park Road**  
Road Improvements

**Jetty Use Area**  
Add Pavilion

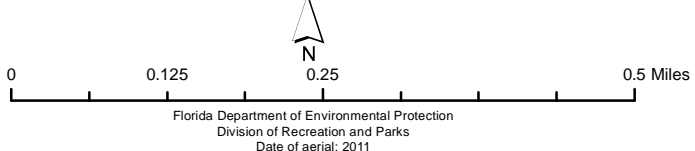
**LEGEND**

-  Proposed Facilities
-  Proposed Trails
-  Proposed Development Area
-  Park Boundary

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ST. ANDREWS STATE PARK  
MAINLAND




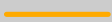




CONCEPTUAL LAND USE PLAN





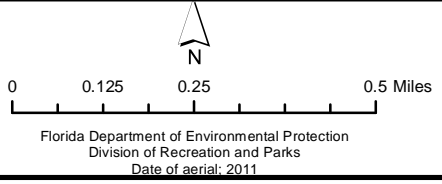
**LEGEND**

-  Restroom-Primitive
-  Interpretive Panels
-  Proposed Boardwalk
-  Existing Boardwalk
-  Wilderness Preserve
-  Park Boundary

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ST. ANDREWS STATE PARK  
SHELL ISLAND



CONCEPTUAL LAND USE PLAN



observation. Interpretive exhibits and programs will continue to be offered at the park. The park's ability to accommodate current visitation levels will be enhanced.

***Objective: Expand the park's recreational carrying capacity by 272 users per day.***

Hiking and picnicking developments are proposed at the park that will expand the park's recreational opportunities and increase the estimated carrying capacity. Expansion of recreational opportunity is discussed in detail below.

***Objective: Continue to provide the current repertoire of interpretive, educational and recreational programs on a regular basis.***

Ranger interpretive programs are offered on a wide range of topics weekly from Memorial Day to Labor Day. Programs include nature and history hikes or recreational skills-building such as kayaking, fishing, or cast netting. Monthly programs are offered year round with help from volunteer naturalists on topics such as native plants, insects, or park history. Ranger programs and tours are available upon request throughout the year, when staffing is available. Numerous schools visit the park for educational programs with rangers throughout the year. Park staff also provides educational programs within the local community upon request. The park and Citizen Support Organization host many special events throughout the year, including two coastal cleanups, Junior Ranger Days, Pack Walks, Walk into the Wild, First Day Hikes, FWC Women's Fishing Clinic, numerous 5K/10K foot races, Panama City Beach Marathon, and Ironman Triathlon.

Interpretive programming also exists parkwide in the form of informational kiosks and interpretive signs at use areas and along trails. Maintenance and improvements to these existing signs will be made as information is updated or as needed.

***Objective: Develop 5 new interpretive, educational and recreational programs.***

Park staff plans to develop a night events program for registered campers, including campfire building and film viewing. Additionally, the park continues to gain popularity among local school districts for the educational opportunities provided. In response to this academic interest, the park will revise its existing interpretive programs and develop new concepts to meet STEM (science, technology, and math) criteria and correspond to the curricula of participating schools. Continuing to build upon the current repertoire of recreational programs, the park is certified as a 5K/10K race course by the U.S. Track and Field Association and will accordingly host more race events annually.

Contingent upon the development of a visitor tram service between use areas within the park, there will be opportunity for additional interpretive and

educational programming to be provided on the tram. Informational signage and staff or volunteer guides may provide information about natural communities that are visible from the tram along the tram circuit. Additional interpretive and educational resources will be provided at the concession shuttle waiting area at the Gulf Pier Use Area.

## **Proposed Facilities**

### **Capital Facilities and Infrastructure**

**Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.**

The conceptual land use plan for St. Andrews State Park proposes to enhance the quality of the visitor experience and facilitate access to resource-based recreation within existing use areas. Most of the proposed developments and improvements are not intended to significantly increase the park's recreational carrying capacity, but rather to improve access and egress through the park's use areas, provide interpretation of the park's natural and cultural resources, offer wayfinding, minimize impacts to sensitive resources, and maximize the comfort and safety of visitors.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities, improve the protection of park resources, and streamline the efficiency of park operations. The following is a summary of improved, renovated, and new facilities needed to implement the conceptual land use plan for St. Andrews State Park:

***Objective: Maintain all public and support facilities in the park.***

All capital facilities, trails, and roads within the park will be kept in proper condition through the daily or regular work of park staff and/or contracted help.

***Objective: Improve/repair 6 existing facilities and 0.4 mile of road.***

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by DRP). The following discussion of other recommended improvements and repairs is organized by use area within the park.



## **Mainland**

### **Entrance Area**

The entrance area will be redesigned to facilitate access and egress of vehicles at the ranger station for day use visitors and campers. Alleviation of traffic congestion during peak visitation periods should be a priority. Design may include multiple entry lanes to reduce the extent of vehicle stacking, especially for campers. A new entrance station will serve both day use entry and camper registration. The environmental interpretive center will be relocated to the current location of the concession store near the Lagoon Use Area. Improved wayfinding will be posted to efficiently guide visitors to the park's use areas.

### **Park Road**

As the park road is evaluated for resurfacing, considerations should also be made to accommodate multimodal transportation. Safe and convenient multimodal access parkwide would encourage visitors to enter the park and transition between use areas by walking or bicycling, which would reduce traffic congestion and parking demand. Roadway modifications to the segment of park road extending between the Lagoon and Jetty use areas should include consideration of a separated parallel path or boardwalk. A separate path along this corridor would provide opportunity for visitors to reach the Buttonbush Marsh and Gator Lake Interpretive Areas as well as the campground by bicycle or walking. This corridor should additionally be evaluated for redesign to restore the natural hydrology of the adjacent Gator Lake and Buttonbush Marsh wetland communities, which are bisected by the roadbed.

### **Tram**

In addition to the existing Shell Island Tour Shuttle, a tram is proposed to circulate the park road to provide a public transportation alternative for visitors, serving further to reduce traffic congestion and parking demand. Stops will be located along the main park road to connect use areas, especially the campground to the Gulf Pier and Jetty beaches. Connector trails will facilitate access between the campground and tram stop along the park road. As the tram will continually loop throughout the property, it provides an opportunity for interpretation. Interpretive programming on the tram may include educational signage and staff or volunteer guides during peak visitation.

### **Gulf Pier Use Area**

The Gulf Pier Use Area underwent significant improvements within the 2004-2014 planning period, including renovation of the Gulf Pier and relocation of the concession store/restroom building. The Gulf Pier Use Area continues to serve as a popular destination for fishing, picnicking, and general beach use. This use area parking lot is the primary pick-up point for visitors using the Shell Island tour concession shuttle. Groups of 20 to 30 visitors routinely congregate in the parking lot to wait for the shuttle. Adding awnings to the concession/restroom building is recommended to provide a waiting shelter. Under the awnings and along the building walls, interpretive kiosks or panels should be provided.

### **Jetty Use Area**

An additional pavilion is proposed in the Jetty Use Area adjacent to the three existing picnic pavilions. The existing pavilions are highly popular for both picnicking and scuba dive staging. Given the popularity of these pavilions and to reduce potentially conflicting recreational uses, the additional pavilion should include elevated benches and tables designed specifically to accommodate scuba diving equipment. This addition would provide ample space for more visitors to utilize the Jetty Use Area for both picnicking and diving. The new pavilion is recommended to be constructed within the existing disturbed area to avoid impact to the adjacent beach dune and scrub.

Additional conveniences (e.g., racks) for specific recreational activities may be provided at the Jetty Use Area pavilions or along the boardwalks. These accommodations may include mobile racks for surfing and paddleboard gear.

### **Lagoon Use Area**

The Lagoon Use Area receives intensive recreational use. Walkways and docks need to be improved in order to continue efficiently facilitating boat launching/landing in the park. The concrete walkway along the seawall is in disrepair and requires accessibility upgrades. The boat basin may need dredging by the end of this 10-year planning period. The fishing pier was inspected in 2013 and significant repairs are recommended. Several pilings, as well as the decking, need to be replaced, and the retaining wall needs to be rebuilt. As repairs are made, the pier should retain its existing structural footprint.

The restroom should be replaced with a new bathhouse facility appropriate for the diverse recreational needs of the area. The existing restroom is undersized for the volume of visitors and lacks lighting and accessibility. Additional amenities should also be added to the Lagoon Use Area, including pavilions and an ADA-compliant canoe/kayak launch for paddlers. Pavilions will accommodate picnicking where there are currently only unsheltered tables. The canoe/kayak launch should be located on a sandy segment of the Grand Lagoon shoreline to utilize the natural surface of the site. The location of the canoe/kayak launch should also be sensitive to paddler safety and intersections with motorized boat traffic.

The concession operation, located at the three-way intersection just outside of the Lagoon Use Area, should be relocated within the Lagoon Use Area. A new store should be located near the dock on the west end of the lagoon area where the concessionaire launches tour and rental boats. Relocating the concession is proposed to consolidate operations of the concession and improve convenience for visitors arranging Shell Island tours or boat rentals and purchasing supplies. The site of the current concession operation is recommended to be converted to the new environmental interpretive center. Alternatively, the new environmental interpretive center could be constructed at another location within the Lagoon Use Area. Traffic flow through this intersection and parking should be redesigned to improve convenience of access and safety.

## **Campground**

Several campsites and segments of road throughout both the Lagoon and Pine Grove loops are vulnerable to frequent flooding and portions of the campground shoreline are significantly eroded. Landscape improvements throughout the campground are recommended to mitigate erosion and runoff. Landscape improvements may also enhance vegetative buffers between campsites. Mitigation of shoreline erosion and buffering from tidal flooding may require restoration of the adjacent tidal marsh or extension of the existing low-profile breakwater along the campground shoreline. Where possible, the park should coordinate with Bay County and the St. Andrews Aquatic Preserve to mitigate shoreline erosion by developing a living shoreline.

## **Shell Island**

### **Access Improvements**

Access improvements are needed on Shell Island for visitors to make the passage from St. Andrew Bay to the Gulf. Facilities are needed to assist visitors to cross sensitive habitats and to minimize impacts to the natural landscape. One boardwalk is currently proposed at the west end of the island. The boardwalk should link to the designated landing point for the concession boat.

### **Restrooms**

Primitive restroom facilities are proposed on Shell Island to reduce human impacts. Facilities are currently needed at the west end of the island, adjacent to the proposed boardwalk and at the existing concession docks at Spanish Ante Point. Restrooms should use composting disposal or other best management practices for minimal ecological impact. Design should be low-profile to minimize interruption of Shell Island's natural viewshed. Construction should be highly storm-resistant.

### **Interpretation**

Improved interpretive panels are recommended at the west end and multiple locations within the Spanish Ante area of Shell Island. Interpretive topics should include imperiled species, barrier island dynamics, and prehistoric and historic uses of the island. Elements may also include "leave no trace" principles and wayfinding maps to recognize boundaries between the park and private parcels located within the Spanish Ante subdivision.

### **Wilderness Preserve**

Designation of a Wilderness Preserve is recommended on the western portion of the Shell Island park property (see Conceptual Land Use Plan). A Wilderness Preserve is an area within a state park that retains its primeval character and is managed to preserve and interpret its natural character and values. A designated Wilderness Preserve generally appears to have been shaped by the unaltered forces of nature, with the imprint of human influence substantially unnoticeable. A Wilderness Preserve offers outstanding opportunities for the conditions of solitude and remoteness that are essential for a wilderness

experience. The area may contain environmental, archaeological, or other kinds of features of scenic, educational, natural, or historic value. Facilities are often limited to those considered essential for resource management and for the specified public uses.

The area proposed for designation as a Wilderness Preserve consists of approximately 470 acres, including 3.7 miles of shoreline along the Gulf of Mexico and St. Andrew Bay, and will provide additional interpretive opportunity for a significant area of natural communities unique to the barrier island environment, including scrub, coastal dune lake, and coastal grassland.

Access is permitted at any point along the shoreline so that visitors may arrive to the Wilderness Preserve by boat and enjoy use of the beach. A public information program will be developed to educate visitors about the preserve and to foster visitor-based stewardship.

***Objective: Construct 1.2 miles of trail.***

The interior of the mainland portion of the park contains a significant area of basin marsh and maritime hammock, known as the Buttonbush Marsh. As the park currently offers only limited opportunities for hiking, there is need for an additional trail. The Buttonbush Marsh Trail would stem from the site's existing and popularly used boardwalk overlook area to form a 1.2-mile loop around the perimeter of the Buttonbush Marsh within the park's interior. The trail will offer greater access to this otherwise hidden natural resource. Additional overlook platforms may be constructed at scenic points along the trail where impacts to the adjacent wetland community would be minimal.

## **Facilities Development**

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

### **Mainland**

#### **Entrance Area**

Entrance redesign

#### **Park Road**

Road resurfacing

Tram stops and connector trails

Bicycle/pedestrian path

#### **Gulf Pier Use Area**

Waiting shelter and interpretation

#### **Jetty Use Area**

Pavilion (1)

#### **Lagoon Use Area**

Accessibility improvements

Pier maintenance

Concession store

New restroom (1)

Picnic pavilions (2)

Canoe/kayak launch

Relocated environmental interpretive center

#### **Buttonbush Marsh Interpretive Area**

Loop trail (1.2 mile)

#### **Campground**

Landscape improvements

Shoreline erosion control

### **Shell Island**

#### **Wilderness Preserve**

Boundary designation

#### **West End (Jetty Area)**

Boardwalk (1)

Primitive restroom (1)

Interpretive panels

#### **Spanish Ante Point Concession Docks/Boardwalk**

Primitive restroom (1)

Interpretive panels

#### **Spanish Ante Area**

Interpretive panels

## **Recreational Carrying Capacity**

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 6).

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 6.

<b>Table 6. Recreational Carrying Capacity</b>						
<b>Use Area/Activity</b>	<b>Existing Capacity*</b>		<b>Proposed Additional Capacity</b>		<b>Estimated Recreational Capacity</b>	
	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>
<b>Mainland</b>						
<b>Beach Use</b>						
Gulf Shoreline (Pier & Jetty)	270	540			270	540
Pass Pool Shoreline	195	390			195	390
Sandy Point Shoreline	77	154			77	154
<b>Trail Hiking/Interpretation</b>						
Gator Lake Overlook	10	40			10	40
Gator Lake/Heron Pond Trail	20	80			20	80
Buttonbush Marsh Overlook	10	40			10	40
Buttonbush Marsh Trail			20	80	20	80
Environmental Center	40	160			40	160
<b>Pier Fishing</b>						
Gulf Pier	40	80			40	80
Grand Lagoon Marina Pier	12	24			12	24
<b>Picnicking</b>						
Covered Pavilions (Parkwide)	96	192	24	48	120	240
<b>Boating</b>						
Marina Boat Launch	4	288			4	288
Canoe/Kayak Launch			2	144	2	144
<b>Camping</b>						
Standard Facility	1,408	1,408			1,408	1,408
Group Camp	40	40			40	40
<b>Shell Island</b>						
<b>Beach Use</b>						
Gulf Shoreline	962	1,924			962	1,924
<b>Boat Access</b>						
Tour Boats	750	1,500			750	1,500
<b>TOTAL</b>	<b>3934</b>	<b>6860</b>	<b>46</b>	<b>272</b>	<b>3980</b>	<b>7132</b>
*Existing capacity revised from 2004 approved plan according to DRP guidelines.						

## **Optimum Boundary**

The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary.

Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with any regulatory purposes. Any party or governmental entity should not use a property's identification on the optimum boundary map to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or suggest that any government entity should impose additional or more restrictive environmental land use or zoning regulations. Identification should not be used as the basis for permit denial or the imposition of permit conditions.

Remaining privately owned parcels on Shell Island are proposed for addition to the park to expand the park's resource management and conservation efforts. Where owners of these parcels are willing, future management of these parcels would alleviate operational and resource protection challenges, especially for imperiled species protection within the beach dune habitat. Acquisition of the Bay County rights-of-way through the private subdivision would likewise be beneficial to resource management efforts of the park. Additionally, acquisition of the 30-acre Coast Guard parcel, located on the west end of Shell Island, would assist resource management. At this time, no lands are considered surplus to the needs of the park.

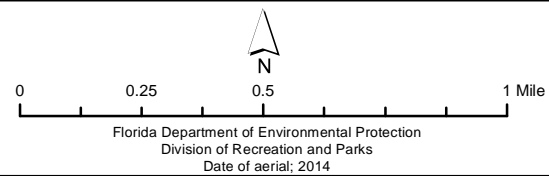




# Legend

- Park Boundary
- Optimum Boundary

ST. ANDREWS STATE PARK



OPTIMUM BOUNDARY MAP



## **IMPLEMENTATION COMPONENT**

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural and recreational resources. They outline the park's management needs and problems, and recommend both short and long-term objectives and actions to meet those needs. The implementation component addresses the administrative goal for the park and reports on the Division of Recreation and Parks (DRP) progress toward achieving resource management, operational and capital improvement goals and objectives since approval of the previous management plan for this park. This component also compiles the management goals, objectives and actions expressed in the separate parts of this management plan for easy review. Estimated costs for the ten-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

### **MANAGEMENT PROGRESS**

Since the approval of the last management plan for St. Andrews State Park in 2004, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

#### **Park Administration and Operations**

- Continued to fulfill the goals of the Florida Park Service mission, maintaining infrastructure, and meeting visitor's expectations

#### **Resource Management**

##### **Natural Resources**

- Met all prescribed fire goals and treating of exotics in all natural communities
- Continued to monitor and protect shorebird and sea turtle nests on park mainland and Shell Island
- Continued to protect and monitor beach mice on Shell Island
- Recorded gopher tortoise populations on park mainland
- Removed coyotes, feral cats, raccoons, and opossums from park mainland and Shell Island

##### **Cultural Resources**

- Added 4 sites within St. Andrews State Park to the Florida Master Site File
- Conducted restoration and research of 3 of the park's cultural sites

#### **Recreation and Visitor Services**

- Added over 40 different types of new interpretive programs for both the mainland and Shell Island
- Added ten special events that the park hosts for the local community and local charities with the support of the Friends of St. Andrews State Park, Inc.
- Added grills to the picnic areas at the lagoon, jetty, and pier pavilions

- Coordinated with the St. Andrews Aquatic Preserve to replace channel markers leading to the two docks and boardwalks at Shell Island
- Added three accessible wheelchairs for the day use areas and Shell Island
- Added horseshoe throwing pit in the campground
- Added bicycle racks throughout park
- Added fence railing to sensitive areas to minimize visitor impact and direct flow

### **Park Facilities**

- Built an Environmental Interpretive Center with the assistance of the Friends of St. Andrews State Park, Inc.
- Added a second entrance lane into the park
- Repaired seven boardwalks, making four of the boardwalks accessible, including nature trail boardwalks
- Added accessible handrails throughout the day use and campground facilities
- Remodeled concrete sidewalks in the day use and campground to meet current accessibility standards
- Redesigned the marina, jetty, and pier parking lots
- Renovated the Gulf Pier Use Area by removing the old pier store and restroom building and constructing a new facility away from the beach dune community
- Replaced all pavilion/entrance station shingle roofs with metal roofs
- Painted each of the park's pavilions
- Remodeled bathhouses 1 and 2
- Replaced shower flooring in bathhouses 3 and 4 to correct water drainage issue
- Added paved accessible parking for Gator Lake and Buttonbush Marsh
- Improved and secured the railings at the Gulf and Grand Lagoon piers
- Re-modeled fish cleaning station
- Improved the marina dock
- Added accessible bench seating to the marina area
- Modified lagoon pier and marina facilities for designation as a DEP Clean Marina
- Modified lagoon restroom and bathhouses 1 and 2 for ADA access
- Initiated the Gator Lake Stabilization Project to protect the shoreline and habitat for Gator Lake
- Replaced the floors in the residences of the park manager and assistant park manager
- Replaced the windows in the residence of the assistant park manager
- Replaced the Gun Mount Pavilion roof with metal paneling
- Upgraded all transformers serving the campground in order to provide higher voltage and more reliable electrical service to campsites and bathhouses
- Replaced five sections of the campground electrical loops with new wiring
- Upgrading individual campsites by raising the height in the campsite to get it above the immediate flood line
- Remodeled the campfire circle and added an amphitheater in the campground
- Initiated construction to replace the current lagoon pier and replace the marina sidewalk
- Repaved and repaired portions of the park road as needed
- Remodeled the dump station on Campers Drive to meet current design standards

- Replaced the docks and boardwalks at Shell Island (long term project)
- Remodeled small pavilion located at the apex of the Shell Island boardwalks
- Updated interpretive signage parkwide
- Upgraded the park communication system to high band radio
- Upgraded outside showers in the day use area
- Upgraded the toilet and shower facilities in the group camping area
- Constructed storage units for beach wheelchairs
- Renovated Buttonbush Boardwalk

## **MANAGEMENT PLAN IMPLEMENTATION**

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 7) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

Many of the actions identified in the plan can be implemented using existing staff and funding. However, a number of continuing activities and new activities with measurable quantity targets and projected completion dates are identified that cannot be completed during the life of this plan unless additional resources for these purposes are provided. The plan's recommended actions, time frames and cost estimates will guide the DRP's planning and budgeting activities over the period of this plan. It must be noted that these recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that the DRP can adjust to changes in the availability of funds, improved understanding of the park's natural and cultural resources, and changes in statewide land management issues, priorities and policies.

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 7 may need to be adjusted during the ten-year management planning cycle.



**Table 7**  
**St. Andrews State Park Ten-Year Implementation Schedule and Cost Estimates**  
 Sheet 1 of 5

**NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.**

<b>Goal I: Provide administrative support for all park functions.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Continue day-to-day administrative support at current levels.</b>	Administrative support ongoing	C	<b>\$2,071,500</b>
<b>Objective B</b>	<b>Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.</b>	Administrative support expanded	C	<b>\$118,000</b>
<b>Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Conduct/obtain an assessment of the park's hydrological needs.</b>	Assessment conducted	UFN	<b>\$12,000</b>
Action 1	Determine how stormwater is impacting natural communities adjacent to the park road.	Assessment conducted	UFN	\$5,000
Action 2	Assess culverts along park road to ensure water flow is adequate to preserve hydrology of the basin marsh.	Assessment conducted	UFN	\$5,000
<b>Objective B</b>	<b>Restore natural hydrological conditions and function to approximately 0.2 acres of mesic flatwoods.</b>	# Acres restored or with restoration underway	UFN	<b>\$17,000</b>
Action 1	Assess how stormwater from adjacent developments at the northern park boundary are impacting mesic flatwoods.	# Miles of ditches filled	UFN	\$10,000
Action 2	Determine corrective measures, potentially adding appropriate water holding structures.	# Crossings/culverts installed	UFN	\$5,000
Action 3	Develop restoration plan to restore the mesic flatwoods.	# Crossings/culverts installed	UFN	\$2,000

\* 2015 Dollars  
 ST = actions within 2 years  
 LT = actions within 10 years  
 C = long term or short term actions that are continuous or cyclical  
 UFN = currently unfunded need





**Table 7**  
**St. Andrews State Park Ten-Year Implementation Schedule and Cost Estimates**  
 Sheet 2 of 5

**NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.**

Goal III: Restore and maintain the natural communities/habitats of the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
<b>Objective A</b>	<b>Within 10 years have 352.6 acres of the park maintained within optimal fire return interval.</b>	# Acres within fire return interval target	LT	<b>\$96,650</b>
Action 1	Develop/update annual burn plan.	Plan updated	C	\$16,000
Action 2	Manage fire dependent communities by burning between 59 - 161.3 acres annually.	# Acres burned annually	C	\$80,650
<b>Objective B</b>	<b>Conduct habitat/natural community restoration activities on variable acres of beach dune community following tropical storm activity.</b>	# Acres restored or with restoration underway	C	<b>\$356,000</b>
Action 1	Develop/update site specific restoration plan after a major storm event.	Plan developed/updated	C	\$21,000
Action 2	Develop shorebird nesting predictive models, based on historic distribution data, to strategize dune restoration efforts while maintaining habitat requirements for a suite of coastal species.	# Acres with restoration underway	LT	\$20,000
Action 3	Implement dune creation and/or dune revegetation restoration plan.	# Acres Compelted	UFN	\$315,000
<b>Objective C</b>	<b>Stabilize bay shoreline and reduce erosion on 0.8 miles of estuarine unconsolidated substrate.</b>	# Acres improved or with improvements underway	LT	<b>\$63,000</b>
Action 1	Assess and monitor current erosion along the bay shoreline.	Assessment conducted	LT	\$3,000
Action 2	Develop/update site specific restoration plan and design for living shoreline.	Plan developed/updated	LT	\$2,000
Action 3	Implement living shoreline project.	Restoration Implemented	UFN	\$44,000
Action 4	Design and install interpretive signage.	Signage Installed	UFN	\$14,000
<b>Objective D</b>	<b>Conduct natural community/habitat improvement activities on 0.4 acres of beach dunes and 0.2 acres of scrub on Shell Island and 0.2 acres on the mainland.</b>	# Acres improved or with improvements underway	LT	<b>\$17,000</b>
Action 1	Visually inspect habitat for the use and creation of unauthorized trails through the beach dune and scrub natural communities.	# Acres inspected	LT	\$4,000
Action 2	Monitor for the development of unauthorized trails.	Activities Reported	LT	\$1,000
Action 3	Develop/update site specific restoration plan and design for habitat improvement.	Plan developed/updated	LT	\$1,000
Action 4	Implement improvement plan.	Plan implemented	UFN	\$11,000

\* 2015 Dollars  
 ST = actions within 2 years  
 LT = actions within 10 years  
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 UFN = currently unfunded need



**Table 7**  
**St. Andrews State Park Ten-Year Implementation Schedule and Cost Estimates**  
**Sheet 3 of 5**

**NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.**

Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
<b>Objective A</b>	<b>Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.</b>	Update List	UFN	<b>\$100,000</b>
<b>Objective B</b>	<b>Monitor and document 12 selected imperiled animal species in the park.</b>	# Species monitored	C	<b>\$276,500</b>
Action 1	Develop monitoring protocols for 2 selected imperiled animal species including gopher tortoise and the solitary bee.	# Plans developed		\$4,000
Action 2	Implement monitoring protocols for 12 imperiled animal species including sea turtles, nesting shorebirds, beach mice and migratory shorebirds.	# Species monitored	C	\$264,000
Action 3	When applicable, monitor the beach dune system and determine beach mice and shorebird distribution and population health in response to tropical storm impacts.	Monitoring conducted	C	\$8,500
<b>Objective C</b>	<b>Monitor and document 2 selected imperiled plant species in the park.</b>	# Species monitored	C	<b>\$9,500</b>
Action 1	Develop monitoring protocols for 2 selected imperiled animal species including Godfrey's goldenaster and Cruise's goldenaster.	# Protocols developed	ST	\$2,000
Action 2	Implement monitoring protocols for 2 imperiled plant species including those listed in Action 1 above.	# Species monitored	C	\$7,500
<b>Objective D</b>	<b>Prevent disturbance to nesting and wintering shorebirds.</b>	Disturbance mitigated	C	<b>\$48,500</b>
Action 1	Post, rope and maintain shorebird nesting habitat annually prior to the start of the nesting season.	Signs and rope posted	C	\$17,500
Action 2	Post, rope and maintain shorebird brood-rearing habitat, when feasible.	Signs and rope posted	C	\$5,500
Action 3	Post, rope and maintain seasonal winter locations for roosting shorebirds in locations that overlap with visitor access.	Signs and rope posted	C	\$6,500
Action 4	Work with partners to minimize beach driving and provide outreach/training to staff and others in accordance with FWC's beach driving best management practices.	Outreach/training provided	C	\$7,000
Action 5	Work with partners such as Audubon Florida, the American Bird Conservancy, etc. on interpretive programs aimed at educating and informing park visitors about shorebirds.	# Volunteer Hours	C	\$12,000
<b>Objective E</b>	<b>Work with the USFWS and FWC to augment the Choctawhatchee beach mice population with the mainland park boundary.</b>	Population augmented	LT	<b>\$21,500</b>
Action 1	Work with appropriate partners to assess beach habitat and add beach mice to the St. Andrews State Park mainland.	Habitat and population assessed	ST	\$6,000
Action 2	Work with appropriate partners to trap mice within St. Andrews State Park- Shell Island to translocate them to the mainland.	# Species translocated	LT	\$9,500
Action 3	Work with appropriate partners to monitor the mainland population, including plans for future translocation events if deemed necessary for population persistence.	Monitoring conducted	LT	\$6,000
<b>Objective F</b>	<b>Reduce disturbance to American alligators.</b>	Disturbance mitigated	C	<b>\$13,000</b>
Action 1	Determine current impacts to American alligators at the park, including identifying the primary locations where alligators and park visitors	Impacts identified	C	\$2,000
Action 2	Design interpretive kiosk aimed at improving park visitor awareness related to alligators.	Kiosk designed	LT	\$11,000

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**Table 7**  
**St. Andrews State Park Ten-Year Implementation Schedule and Cost Estimates**  
**Sheet 4 of 5**

**NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.**

<b>Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Annually treat 4.9 acres of exotic plant species in the park.</b>	# Acres treated	C	<b>\$3,136</b>
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$0
Action 2	Implement annual work plan by treating 4.9 acres in park, annually, and continuing maintenance and follow-up treatments as needed.	Plan implemented		\$8,897
<b>Objective B</b>	<b>Implement control measures on 4 and exotic animal species in the park.</b>	# Species for which control measures	C	<b>\$2,000</b>
Action 1	Work with USDA to continually reduce coyote, feral cat, red fox and armadillo populations at St. Andrews State Park.	Species reduced		\$77,000
<b>Goal VI: Protect, preserve and maintain the cultural resources of the park.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Assess and evaluate 6 of 8 recorded cultural resources in the park.</b>	Documentation complete	LT	<b>\$4,430</b>
Action 1	Complete 6 assessments/evaluations of archaeological sites.	Assessments complete	C	\$3,000
Action 2	Complete 18 Historic Structures Reports (HSR's) for historic buildings and cultural landscape. Prioritize stabilization, restoration and rehabilitation projects.	Reports and priority lists completed	LT	\$1,430
<b>Objective B</b>	<b>Compile reliable documentation for all recorded historic and archaeological sites.</b>	Documentation complete	LT	<b>\$28,803</b>
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or	ST	\$3,000
Action 2	Develop and adopt a Scope of Collections Statement.	Documented completed	ST	\$2,229
Action 3	Conduct oral history interviews.	Interviews completed	ST	\$1,787
Action 4	Compile a park administrative history.	Report completed	LT	\$1,787
Action 5	Conduct Level 1 archaeological survey for 1 priority areas identified by predictive model.	Survey completed	UFN	\$20,000
<b>Objective C</b>	<b>Bring 3 of 8 recorded cultural resources into good condition.</b>	# Sites in good condition	LT	<b>\$6,574</b>
Action 1	Design and implement regular monitoring programs for 6 cultural sites.	# Sites monitored	C	\$1,787
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	\$1,787
Action 3	Coordinate with partners such as DHR to assess cultural sites impacted by eroding shorelines and develop stabilization/restoration plans if deemed necessary.	Assessments completed	LT	<b>\$3,000</b>

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Table 7  
St. Andrews State Park Ten-Year Implementation Schedule and Cost Estimates  
Sheet 5 of 5

**NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.**

Goal VII: Provide public access and recreational opportunities in the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Maintain the park's current recreational carrying capacity of 6,860 users per day.	# Recreation/visitor	C	\$2,071,504
Objective B	Expand the park's recreational carrying capacity by 272 users per day.	# Recreation/visitor	LT	\$39,131
Objective C	Continue to provide the current repertoire of interpretive, educational and recreational programs on a regular basis.	# Interpretive/education programs	C	\$10,000
Objective D	Develop 5 new interpretive, educational and recreational programs.	# Interpretive/education programs	LT	\$10,000
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Maintain all public and support facilities in the park.	Facilities maintained	C	\$2,320,085
Objective B	Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.	Plan implemented	LT	\$10,000
Objective C	Improve and/or repair 6 existing facilities and 0.4 miles of road as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	LT	\$3,851,843
Objective D	Construct 1.2 miles of trail.	# Facilities/Miles of Trail/Miles of Road	LT	\$88,704
Objective E	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	C	\$43,826.86
Summary of Estimated Costs				
<b>Management Categories</b>				<b>Total Estimated Manpower and Expense Cost* (10-years)</b>
Resource Management				\$1,822,924
Administration and Support				\$2,071,504
Capital Improvements				\$3,940,547
Recreation Visitor Services				\$2,130,635
Law Enforcement Activities			Note: Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.	

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## **Addendum 1—Acquisition History**



## St. Andrews State Park Acquisition History

LAND ACQUISITION HISTORY REPORT					
<b>Park Name</b>	St. Andrews State Park				
<b>Date Updated</b>	8/18/2015				
<b>County</b>	Bay				
<b>Trustees Lease Number</b>	3642 (formely 2324)				
<b>Current Park Size</b>	1,167.08 acres				
<b>Purpose of Acquisition</b>	To use the land as park				
Acquisition History					
Parcel Name or Parcel DM-ID	Date Acquired	Seller	Purchaser	Size in acres	Instrument Type
Initial Acquisition parcel	8/23/1946	Trustees of the Internal Improvement Trust Fund of the State of Florida	Florida Board of Forestry and Parks	137.01	Deed
11766	3/14/1986	Perimeter Investment	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	41.29	Warranty Deed
3152	12/2/1982	Gulf Coast Community College	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	14.19	Quitclaim Deed
10962	12/3/1961	Bay County, Florida	L. G. Buck	24.91	County Deed
12812	1/2/1997	Waite Development, Inc.	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	24.97	Corrective Special Warranty Deed
Management Lease					
Parcel Name or Parcel ID	Date Leased	Lessor	Lessee	Term	Expiration Date
The Trustees owns all parcels.	1/23/1968	Trustees of the Internal Improvement Fund of the State of Florida	The Florida Board of Parks and Historic Memorials	50 years	2/27/2034
Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue		Term of the Outstanding Issue	
No known outstanding issue.					



## **Addendum 2—Advisory Group Members and Report**



**St. Andrews State Park  
Advisory Group and Report**

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**Local Government**

**Representatives**

The Honorable William T. Dozier,  
Commissioner  
Bay County Board of  
County Commissioners

Candis Harbison, President  
Bay County Conservancy

Charlie Yautz, President  
Friends of St. Andrew Bay

The Honorable Gayle Oberst, Mayor  
City of Panama City Beach

Ken Karr, Chairman  
Friends of the Grand Lagoon

The Honorable Greg Brudnicki,  
Mayor  
City of Panama City

Mike Sturdivant, Chair  
Surfrider Foundation, Emerald  
Coast Chapter

**Agency Representatives**

Brian Addison, Manager  
St. Andrews State Park

Justin Davis, Regional Biologist  
Florida Fish and Wildlife  
Conservation Commission

Katie M. Maxwell, Preserve  
Manager  
Florida Coastal Office  
Central Panhandle Aquatic  
Preserves

John Sabo, Chipola River District  
Manager  
Chipola Forestry Center  
Florida Forest Service

Melody Ray-Culp, Regional  
Biologist  
U.S. Fish and Wildlife Service  
Florida Panhandle Coastal Program

**Environmental and  
Conservation Representatives**

Kennard Watson, Director  
Panama City Beach Turtle Watch

Julie Wraithmell, Director of Wildlife  
Conservation  
Audubon Florida

**Tourism and Economic  
Development Representatives**

Dan Rowe, President & CEO  
Panama City Beach Convention &  
Visitors Bureau

Carol Roberts, President/CEO  
Bay County Chamber of Commerce

**Recreational User  
Representatives**

Brad Stephens, President  
Panama City Kayak Fishing  
Association

Captain Pat Green, Founder  
Panama City Dive Club

Stan Jones, Chapter President  
Marine Industries Association of  
Northwest Florida

Stephanie Somerset, President  
Friends of Shell Island

Catherine Zehner, Chair  
Bay Families with Dogs, Inc.

**St. Andrews State Park  
Advisory Group and Report**

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**Adjacent Landowners**

Alan Lark, Shell Island Homeowner

Mary Sittman, Shell Island Parcel  
Owner

Debbie Wheeler, General Manager  
Moonspinner Condominiums

Sheryl Bailey, Manager  
Panama City RV Resort

Donald Jenkins  
325th CES Conservation Officer  
Tyndall Air Force Base

**Citizens Support Organization**

Anne Ake, President  
Friends of St. Andrews State Park



**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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The third of three advisory group meetings to assist with the development of the unit management plan update for St. Andrews State Park was held in the auditorium of J.R. Arnold High School on Thursday, March 17, 2016.

Jim Ponek represented Mayor Gayle Oberst. Greg Presser represented Mayor Greg Brudnicki. Patty Kelly represented Melody Ray-Culp. J. Michael Brown represented Dan Rowe. Kennard Watson, Charlie Yautz, Mike Sturdivant, Carol Roberts, Pat Green, Debbie Wheeler, Sheryl Bailey, Alan Lark, and Donald Jenkins were not in attendance. All other appointed advisory group members were present as well as five members of the public. Attending Division of Recreation and Parks (DRP) staff were Sine Murray, Daniel Alsentzer, Eric Pate, Tyler Maldonado, Raya Pruner, and Brian Addison. Also attending was Jason Mahon, Office of Communications, Department of Environmental Protection (DEP).

Members of the advisory group and staff began the meeting at 9:00 AM. Sine Murray opened the meeting with a word of welcome and introductions of the attending members of DRP staff. Members of the advisory group then introduced themselves and stated the name of the agency or organization they represented. Ms. Murray then asked each member of the advisory group to express their comments on the draft plan.

**Summary of Advisory Group Comments**

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**Ken Karr** (Friends of Grand Lagoon) commented that the language in the plan is not clear or specific enough to avoid future reinterpretation and/or misinterpretation. He recommended that the plan use a clearer definition of the word "preserve" and ensure that this language does not restrict public access of the park for recreational purposes. He noted that the 50-foot management authority language should be removed from the plan. Mr. Karr stated that the old pass on the east end of Shell Island should be reopened. He voiced concerns about the use of 4-wheelers for management purposes on Shell Island and proposed a responsible cleanup of shorebird protection signage after nesting season has ended. He appreciated many of the land use proposals for the park mainland.

**Patty Kelly** (U.S. Fish and Wildlife Service (USFWS)) indicated that the low productivity of snowy plovers is noted in the resource management component of the plan, but the extent of the decline is not stated. She cited various observed and measured indicators of the decline in shorebird nesting health and success rates. She recommended more language outlining park rules pertaining to dogs. Ms. Kelly recommended that the approach to calculating carrying capacity should be revised to reflect actual visitation patterns and ecological parameters.

**Justin Davis** (Florida Fish and Wildlife Conservation Commission (FWC)) noted corrections to the imperiled species list for wading birds that have been delisted. He expressed that there should be an established buffer around bird rookeries. Mr. Davis added that the carrying capacity and actual number of visitors to the park, especially to Shell Island, should be more precisely tallied.

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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**John Sabo** (Florida Forest Service (FFS)) complimented park staff on prescribed burning efforts in the park and stated that the park's scrub and wetland communities do not form productive timber sites.

**J. Michael Brown** (Panama City Beach Convention & Visitors Bureau) cited that in light of being new to the advisory group, he declined to comment and preferred to listen to the proceedings. He noted that Tracy Rudhall, who had previously attended on behalf of the Convention & Visitors Bureau has previously provided comments.

**Stan Jones** (Marine Industries Association of Northwest Florida) inquired about the St. Andrews Bay Aquatic Preserve in regards to management activities and regulatory authority. He commented that he perceives the word preserve to mean that there will be limitations on user's access and recreational use of Shell Island. He added that any closures or restrictions on the navigable waters around Shell Island would have a detrimental effect on the marine industry in the region, which is presently stagnant and in need of revitalization. Following the aquatic preserve manager's explanation of FCO management activities, Mr. Jones offered his organization's support in boater education efforts. He stated that the 50-foot management authority language should be removed from the plan.

**Catherine Zehner** (Bay Families with Dogs, Inc.) stated that she categorically opposes the unit management plan and any restrictions on access to or recreational use of Shell Island. She specifically expressed her disapproval of the 50-foot management zone into the waters off the beach of Shell Island. She commented that the presence of the aquatic preserve around Shell Island makes the 50-foot management zone duplicative. She stated that the park service does not need additional management authority to remove litter or debris. She expressed concerns that the management authority language could potentially lead to more restrictive public access and recreational use of Shell Island. In regards to the carrying capacity of Shell Island, she emphasized that the park could control and moderate visitation to the island by reducing the number of visitors brought to the island by the concession shuttles. Ms. Zehner requested reconsideration of the wilderness preserve concept. She requested that the plan add language to clarify that the private parcels of the subdivision are not subject to park management or state park rules. She noted that any restrictions to the recreational use of Shell Island will result in a loss of revenue to the tourism and boating industries in the region. She did not encourage the development of a public dog park on Shell Island, stating that dogs are not predators and therefore not a threat to shorebirds. She did not condone blaming of boaters and their pets for perceived shorebird nesting failures. She expressed disappointment with the public hearing and advisory group process and requested that public comments to be taken into serious consideration.

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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**Mary Sittman** (Shell Island property owner) commented on the history of the Spanish Ante subdivision and explained that the lots were originally platted as residential. She inquired about the park's previously stated intention of conducting boundary surveys on Shell Island and advised that such a survey would not be an effective use of funds. Ms. Sittman objected to the optimum boundary proposed in the plan, suggesting that the language concerning the acquisition of rights-of-way on the island should be removed from the unit management plan as such an acquisition would only be allowable if all lots are held by a single owner.

**Stephanie Somerset** (Friends of Shell Island) thanked the park service for the opportunity to participate in the advisory group. She expressed her concern that the new management authority in the 50-foot management zone extending from the beaches of Shell Island will restrict access for recreational users. She commented that the management authority is an unnecessary regulation that will negatively impact park visitors. She added that the vague wording in the description of the management authority could potentially lead to an abuse of authority. She stated that members of the advisory group were given preferential treatment throughout the advisory group process and suggested that participation by some members in the advisory group represents a conflict of interest, given their roles in conducting studies of shorebirds on Shell Island. She commented that the shorebird study will allow DEP to blame boaters for shorebird nesting declines. Ms. Somerset expressed her commitment to preventing any restrictions on the recreational usage of Shell Island. She noted that the boating community has not requested additional accommodations or facilities on Shell Island and practices good environmental stewardship. She offered her organization's support in cooperation on visitor education and outreach.

**Jon Brucker** (Central Panhandle Aquatic Preserves) explained the boundaries of the St. Andrews Aquatic Preserve located in the Bay and Gulf of Mexico. He identified the types of management actions that are under the preserve's authority. He commented on the importance of protecting Shell Island and the waters surrounding the island. He expressed his concern with the effects of park usage on water quality and seagrasses. He discussed the potential negative environmental impacts associated with the installation of restroom facilities on Shell Island. Mr. Brucker commented on the impacts of marine debris in relation to the aquatic preserve and noted that managing agencies have limited resources to address this issue. He noted that litter washes ashore and is occasionally left by visitors, which requires the attention of staff. He proposed more signage, explaining the aquatic preserve's importance in improving St. Andrew Bay's water quality. He added that design of signage should be coordinated with relevant agencies, user groups, and conservation land managers.

**William Dozier** (Bay County Board of County Commissioners) recommended that some campsites in the park should be set aside for last-minute reservations. Commissioner Dozier proposed the construction of an additional dune-crossover

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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boardwalk on Shell Island to benefit both visitors and the sensitive natural areas. Commissioner Dozier additionally encouraged development of trails in the proposed wilderness preserve. He suggested that the language concerning the 50-foot management zone should be removed from the plan and stated this management authority does not enhance the park's management activities. He affirmed the legal limitations on park acquisition of the county rights-of-way on Shell Island, given that all of the parcels would need to be owned by a single owner or all owners would need to agree to the acquisition and associated restrictions. He stated that Bay County is not interested in selling the county rights-of-way. Commissioner Dozier acknowledged the optimum boundary's purpose of being a "wish list" and a tool for long-range planning.

**Greg Presser** (on behalf of Mayor Brudnicki, Panama City) expressed his concern about the potential restrictions imposed on boaters and other recreational users by the 50-foot management zone. He stated that most boaters in the community do not misuse their rights to recreational access of Shell Island and noted that the community has been a responsible steward of these resources. He suggested that the St. Andrews Aquatic preserve should adequately address litter and marine debris below the mean water line. Mr. Presser stated that the Mayor does not support visitor restrictions on Shell Island unless visitation is directly linked to disturbance of the park's natural resources. He recommended updates and maintenance of the shorebird protection ropes, stakes, and signage. He suggested an advanced-purchase sticker for boats visiting Shell Island and noted that it could be a potential source of revenue for the park. He stated that this proposal could simplify law enforcement and address carrying capacity issues. He commented on the damages caused by pontoon boats rented by boaters who are unfamiliar with the waters around Shell Island.

**Candis Harbison** (Bay County Conservancy) expressed her support for the wilderness preserve designation. She commented that funding for non-native and problematic predation should be available to consistently address this issue. She agreed that an additional boardwalk is appropriate for low-impact visitor access on Shell Island. She encouraged the efforts to restore the hydrological connection between Gator Lake and Buttonbush Marsh. She recommended a raised observation deck at Buttonbush Marsh to allow for an unobstructed view of the marsh and surrounding natural communities. Ms. supported the tram circulation proposal.

**Anne Ake** (Friends of St. Andrews State Park) appreciated the opportunity to participate in the advisory group process. She encourages the development of the proposed nature trail around the perimeter of Buttonbush Marsh as visitor access to this site does not currently exist. Ms. Ake noted that the scenic character of the site attracts some visitors to enter the area through undesignated trails. She stated that a designated trail would assist in protection of the wetland community types by directing foot traffic along safe and low-impact routes. She would like to ensure that the trail is designed in a manner that balances recreational use and

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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preservation of the adjacent natural communities. Ms. Ake commented that the DRP goal of protecting natural resources and providing recreation is not an easy task and requires compromise.

**Julie Wraithmell** (Audubon Florida) supported the tram and redesigned park entrance proposals. She is in favor of the wilderness preserve designation and noted that this designation has no intention of restricting recreational use. She commented that efforts to discourage alligator feeding at Gator Lake are needed. She recommended the consideration of an elevated boardwalk around Buttonbush Marsh to avoid wetland and erosion impacts. She suggested that DRP wait for the creation of the trail until it can be funded to be as low-impact as possible and able to ensure best management practices. She inquired about the authority and decision-making processes in reference to the privatization of park services. She expressed her concerns about transparency and public input when it comes to privatization efforts. She acknowledged that there are pros and cons regarding the proposed bathroom facilities on Shell Island. She suggested that concession contracts require vendors to properly maintain the bathroom facilities. She is concerned about conflicting messages in regards to the carrying capacity of the park. She commented that the park acknowledges issues associated with overcrowding, yet develops proposals to increase park usage. She recommended studying the magnitude of visitor use on Shell Island, distinguishing between visitors who remain in the water and those who walk ashore. Ms. Wraithmell supported issuing annual Shell Island boating permits and noted the potential to direct revenue from this program to maintenance and future improvements on Shell Island. She acknowledged the historical boating tradition and usage of Shell Island. She discussed the Audubon Society's commitment to shorebird conservation.

**Jim Ponek** (on behalf of Mayor Oberst, Panama City Beach) appreciated the efforts put into the unit management plan. He recommended that the 50-foot management zone language should be removed from the plan. He suggested the establishment of a designated dog area on Shell Island to accommodate the interest in recreational use involving dogs. He commented that he would like to see what the signage on Shell Island would look like and inquired about the language that would be on the signage. He stated that there should be more communication between the park service and local community. He appreciated the opportunity to participate in the advisory group process.

**Brian Addison** (St. Andrews State Park, Park Manager) commented on the challenges associated with limited staffing in a park that has diverse and rare natural communities as well as high visitation and park usage. He stated that the DRP strives for voluntary compliance with park rules by its visitors. Mr. Addison explained that the park works to capture accurate counts of visitation in both portions of the park, and the carrying capacity methodology employed is approved.

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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**Summary of Public Comments**

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Ms. Murray opened the meeting to public comment. Five members of the public addressed the advisory group. Summaries of the oral public comments received at the meeting are provided below. Following public comment, the meeting was adjourned.

**Ron Houser**

- Supported the mission of Audubon Florida.
- Witnessed the degradation of habitat on Shell Island.
- Affirmed findings of the 10-year shorebird nesting study on Shell Island.
- Decision-making based on science, solid evidence, and good judgement.
- Supported the land use proposals described in the plan.

**Norman Capra**

- Encouraged improvements to park entrance and circulation.
- Appreciated the work of the advisory group and development of the UMP.
- Recommended construction of boardwalks in a manner that mitigates impacts.
- Supported the wilderness preserve and intention not to restrict access.
- Stated that the wilderness preserve concept is consistent with historical use patterns on Shell Island.

**Bill Busch**

- Disturbed at the changes he has seen and experienced on Shell Island.
- Noted the challenges of conservation and high rates of visitation.
- Emphasized the stewardship exhibited by local users of Shell Island.
- Stated that excess visitation to Shell Island is facilitated by shuttle service.
- Discouraged restroom facility proposal and restriction of dogs.

**Jim Beers**

- Summarized his review of shorebird studies on Shell Island and provided examples of analogous wildlife studies.
- Explained the need for drawing accurate connections between visitation and nesting rates.
- Stated that impacts to shorebirds occur as a result of research activities.
- Recommended comprehensive preclusion of predation on Shell Island.
- Stated that incremental visitor use restrictions are neither proper for a park nor likely to be effective.

**Candis Harbison**

- Spoke personally, not representing the Bay County Conservancy.
- Emphasized sharing the shoreline while acknowledging different uses and needs.
- Recognized that compromise is needed on the behalf of user groups.
- Stated that development has been detrimental to shorebirds and limited habitat.
- Shell Island should not be a place for dogs under any circumstances.

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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**Staff Recommendations**

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- Corrections to the list of imperiled species were completed in the Resource Management Component of the plan.
- Language regarding boundary surveys and demarcation was removed from the plan.
- The DRP supports establishment of interpretive hiking trails in appropriate locations of the wilderness preserve on Shell Island.
- Designs of future trails and facilities are proposed at the conceptual level. The DRP will assess in greater detail the potential impacts of all proposed development on park resources. The physical plan, scale, and character of proposed development will apply best management practices to minimize potential impacts.
- For submerged lands managed under Management Agreement MA 68-086, the DRP conducts only those management actions specifically mentioned in the applicable management plan, rather than rules specified in Chapter 62D-2 (F.A.C.). The proposed management actions support recreation activities and conservation efforts occurring within the park. The DRP is required to monitor natural and cultural resources and committed to providing safe recreation opportunities for park visitors. The DRP accomplishes these activities on its own or through cooperation with other agencies. Access to areas of submerged lands covered by this agreement, and as described in the management plan, would only be closed if there is a risk to the safety of park visitors.

Additional revisions were made throughout the document to address editorial corrections, consistency of spelling and notations, and other minor corrections.

**Notes on Composition of the Advisory Group**

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**Florida Statutes Chapter 259.032 Paragraph 10(b)** establishes a requirement that all state land management plans for properties greater than 160 acres will be reviewed by an advisory group:

“Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group. Members of this advisory group shall include, at a minimum, representatives of the lead land managing agency, co-managing entities, local private property owners, the appropriate soil and water conservation district, a local conservation organization, and a local elected official.”

**St. Andrews State Park**  
**Advisory Group Meeting Summary**

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Advisory groups that are composed in compliance with these requirements complete the review of State park management plans. Additional members may be appointed to the groups, such as a representative of the park's Citizen Support Organization (if one exists), representatives of the recreational activities that exist in or are planned for the park, or representatives of any agency with an ownership interest in the property. Special issues or conditions that require a broader representation for adequate review of the management plan may require the appointment of additional members. The Division's intent in making these appointments is to create a group that represents a balanced cross-section of the park's stakeholders. Decisions on appointments are made on a case-by-case basis by Division of Recreation and Parks staff.



### **Addendum 3—References Cited**



## St. Andrews State Park References Cited

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- Avissar, A., C. Burney, and N. Douglass. 2012. Guidelines for posting shorebird and seabird sites in Florida. Florida Shorebird Alliance, 21pp.
- Bay County. 2009. The Bay County Comprehensive Plan. Bay County, Florida.
- Brown, A.C., McLachlan, A., 2002. Sandy shore ecosystems and the threats facing them: some predictions for the year 2025. *Environmental Conservation* 29, 62-77.
- Bureau of Beaches and Coastal Systems, 2010. Critically eroded beaches in Florida 2010. Florida Department of Environmental Protection (FDEP). 76 pp.
- Campbell, K.M., 1984. A Geologic Guide to the State Parks of the Florida Panhandle Coast, St George Island, St Joseph Peninsula, St. Andrews and Grayton Beach Parks and Recreation Areas. Leaflet No. 13. 23 pp.
- Chase, C.A., III, and J.A. Gore. 1989. Snowy Plover breeding distribution: Final Performance Report. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.
- Drewa, P.B., W.J. Platt, C. Kwit and T.W. Doyle. Stand structure and dynamics of sand pine differ between the Florida panhandle and peninsula. *Plant Ecology* 196: 15-25.
- Faillace, C.A. 2010. Breeding snowy plovers (*Charadrius alexandrinus*) exhibit variable response to human disturbance on two islands in southwest Florida [thesis]. New Brunswick Rutgers, 63 p.
- FDEP, Bureau of Beaches and Coastal Systems. 2010. *Critically Eroded Beaches in Florida*. <http://www.dep.state.fl.us/beaches/publications/pdf/CritEroRpt7-11.pdf>. 77 pp.
- Florida Department of Environmental Protection. 2013. *Outdoor Recreation in Florida 2013*. Tallahassee, Florida.

## St. Andrews State Park References Cited

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- Florida Department of Environmental Protection. 2014. *Florida State Park System Economic Impact Assessment for Fiscal Year 2013/2014*. Tallahassee, Florida.
- FWC. 2007. Marine Turtle Conservation Guidelines. Fish and Wildlife Research Institute, St Petersburg, Florida.
- FWC. 2010. *Best Management Practices for Operating Vehicles on the Beach*. [http://myfwc.com/docs/Conservation/beach\\_drive\\_flyer\\_clr.pdf](http://myfwc.com/docs/Conservation/beach_drive_flyer_clr.pdf)
- Florida Natural Areas Inventory (FNAI). 2010. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory. Tallahassee, Florida.
- Florida Shorebird Alliance. 2009. *Band Reporting Guidelines*. <http://www.flshorebirdalliance.org/resources-pages/bands.html>
- Himes, J. G., N. J. Douglass, R. A. Pruner, A. M. Croft, and E. M. Seckinger. 2006. Status and Distribution of the Snowy Plover in Florida. 2006 study final report. Florida Fish and Wildlife Conservation Commission (FWC), Tallahassee, Florida, 27 pp.
- Huck, R., A.F. Johnson, A.J. Parker, W.J. Platt and D.B. Ward, 1997. Management of Natural Communities of Choctawhatchee sand pine (*Pinus clausa* (Engelm.) Sarg. Var. *immuginata* Ward) in the Florida panhandle. Resource Management Notes, Florida Park Service, Florida Department of Environmental Protection. 8(4): 89-91
- Lafferty, K.D. 2001a. Birds at a Southern California beach: seasonality, habitat use and disturbance by human activity. *Biodiversity and Conservation* 10:1949-1962.
- Lord, A.J., J.R. Waas, J. Innes, M.J. Whittingham. 2001. Effects of human approaches to nests of northern New Zealand dotterels. *Biological Conservation* 98:233-240.

## St. Andrews State Park References Cited

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- Parker, A.J., K.C. Parker and D.H. McCay, 2001. Disturbance-mediated variation in stand structure between varieties of *Pinus clausa* (Sand pine). *Annals of the Association of American Geographers*. 91(1); 28-47.
- Peterson, C.H., Bishop, M.J., Galen, G.A., D'Anna, L.M., Manning, L.M., 2006. Exploiting beach filling as an unaffordable experiment: Benthic intertidal impacts propagating upwards to shorebirds. *Journal of Experimental Marine Biology and Ecology* 338, 205-221.
- Pruner, R.A. 2010. Conservation and management of the Snowy Plover along the Florida Gulf Coast: Habitat selection, reproductive performance, and the effects of anthropogenic disturbance [thesis]. The University of Florida, Gainesville, Florida, 103 p.
- Pruner, R.A, M. J. Friel, and J. A. Zimmerman. 2011. Interpreting the influence of habitat management actions on shorebird nesting activity at coastal state parks in the Florida panhandle. 2010-11 study final report. Department of Environmental Protection, Florida Park Service, Panama City, Florida.
- Pruner, R. 2012. Shorebird Research and Management at Florida Panhandle State Parks- 2012 Annual Report. FDEP, Division of Recreation and Parks, District 1.
- Puri, H.S. and R.O. Vernon. 1964. Geologic Map of Florida, Florida Bureau of Geology Map Series 18.
- University of Florida, Bureau of Economic and Business Research (UFL BEBR). 2014. *Florida Statistical Abstract 2013*.
- U.S. Department of Commerce, Bureau of Economic Analysis. 2014. 2013 *Personal Income Summary/Per Capital Personal Income*. <http://www.bea.gov/itable/>.
- U.S. Census Bureau. 2013. *State and County Quickfacts*. <http://quickfacts.census.gov/qfd/index.html>, 2014.

## St. Andrews State Park References Cited

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U.S. Fish and Wildlife Service. 2012. Draft Comprehensive Conservation Strategy for the Piping Plover (*Charadrius melodus*) in its Coastal Migration and Wintering Range in the Continental United States. East Lansing, Michigan.

Varner J.M., D.R. Gordon, F.E. Putz, and J.K. Hiers, 2005. Restoring fire to long unburned *Pinus palustris* ecosystems: Novel fire effects and consequences for long unburned ecosystems. *Restoration Ecology* 13:539-544.

Visit Florida! 2013. *2013 Florida Visitor Survey*. Tallahassee, Florida.

## **Addendum 4—Soil Descriptions**





## **St. Andrews State Park Soils Descriptions**

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**25- Hurricane Sand.** This soil is somewhat poorly drained and nearly level. It is in slightly elevated areas on flatwoods. Individual areas of this soil generally range from 10 to more than 100 acres; a few are as small as 3 acres. Slopes are smooth to slightly convex.

Typically, the surface layer is very dark gray sand 5 inches thick. The subsurface layer is sand to a depth of 63 inches. It is brown to a depth of 14 inches, yellowish brown to a depth of 22 inches, brownish yellow to a depth of 47 inches, and white below that. The subsoil is black sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Chipley, Foxworth, Leon, Mandarin, and Rutledge soils. Also included are poorly drained soils in which the surface layer is underlain by a shallow, weakly developed, dark color subsoil. Also included are soils similar to this Hurricane soil except they are poorly drained and areas of soils in which the content of clay increases just above the deep, dark color subsoil. The included soils make up less than 15 percent of the map unit.

This Hurricane soil has a high water table within 20 to 40 inches of the soil surface for 3 to 6 months in most years and below a depth of 40 inches for the rest of the year. The available water capacity is low in the surface and subsurface layers and moderate in the subsoil.

Permeability is rapid in the surface and subsurface layers and moderately rapid in the subsoil. The organic matter content is very low to moderately low.

The natural vegetation consists of pine species, oaks and an understory of native shrubs, saw palmetto, inkberry, broomsedge, and bluestems.

**29- Rutledge Sand.** This very poorly drained soil is on nearly level or slightly depressional areas along drainage ways. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is sand about 22 inches thick. The upper 13 inches is black, and the lower 9 inches is very dark gray. The next layer is gray sand 33 inches thick and the lower layer is 25 inches thick and is light gray sand mottled with yellow and brown.

Included with this soil in mapping are small areas of Dorovan, Leon, Allanton, Mandarin, Osier, Pamilco, Pantego, Pickney, Pottsburg and Rains soils. In a few mapped areas, there is sandy loam subsoil. Small areas of soils that are similar to this Rutledge soil but have a dark surface horizon less than 10 inches thick are included in some mapped areas. Included soils make up less than 20 percent of any mapped area.

This Rutledge soil has a water table at or near the surface for 4 to 6 months during most years and is ponded for 4 to 6 months annually. Available water capacity is low. Permeability is rapid. Internal drainage is very slow, impeded

## St. Andrews State Park Soils Descriptions

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by the high water table. Natural fertility is medium and organic matter content is high in the surface layer.

Natural vegetation is characteristic of mesic flatwoods with slash pine, palmetto, gallberry, and fetterbush dominating the landscape.

**31- Osier fine sand.** This poorly drained soil is in nearly level or slightly depressional areas and flatwoods. Slopes are 0 to 2 percent. Typically, the surface layer is black fine sand about 8 inches thick. The subsurface layer is dark gray fine sand about 26 inches thick. The underlying layer is dark gray fine sand about 10 inches thick, dark gray fine sand about 17 inches thick, gray fine sand about 8 inches thick and fine sand that extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Albany, Chipley, Dorovan, Leon, Allanton, Mandarin, Pamlico, Pottsburg, Hurricane, Pelham, Plummer, and Rutledge soils. Included soils make up less than 15 percent of any mapped area.

This Osier soil has a water table within a depth of 10 inches for 3 to 6 months in most years. Most depressional areas are ponded for 2 to 4 months annually. Permeability is rapid, but internal drainage is very slow because the high water table impedes it. Natural fertility and organic matter content are moderately high in the upper 6 inches and are low below that depth. Available water capacity is low.

The natural vegetation consists of sweetbay, oaks, and pines. Inkberry, saw palmetto, wax myrtle, and pineland threeawn are the most common understory species.

**48- Fripp-Corolla complex, 2 to 30 percent slopes.** This unit is gently sloping to steep. It consists dominantly of excessively drained Fripp soils and moderately well drained to somewhat poorly drained Corolla soils in areas so intricately intermixed in the landscape that they could not be mapped separately at the scale selected. Fripp and Corolla soils are on undulating, dune-like areas adjacent to the Gulf of Mexico. The sloping to steep Fripp soils are on the upper two-thirds of the side slopes and the gently sloping Corolla soils are on the lower one-third. These areas are subject to rare storm tide flooding.

The Fripp soils make up about 55 to 60 percent of the complex. Typically, the surface layer is gray sand about 3 inches thick. Below this to a depth of 80 inches or more is what sand that contains horizontal bands of black heavy minerals and lenses of gray sand. Depth to water table is more than 72 inches. Permeability is rapid. Available water capacity and organic matter content are very low.

The moderately well drained to somewhat poorly drained Corolla soils make up about 25 percent of the complex. Typically, the surface layer is dark gray sand about 3 inches thick. The next 12 inches is gray sand. The next 50 inches is

## **St. Andrews State Park Soils Descriptions**

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what sand. The next 15 inches is light brownish gray sand. Horizontal bands of heavy black minerals are throughout the soil.

The water table is 20 to 60 inches below the soil surface for 1 to 3 months during most years. Permeability is very rapid throughout. Available water capacity and organic matter content are very low.

Soils of minor extent make up the rest of the complex. Included are Baci, Dirego, Dorocan, Osier, Pamlico and Rutlege soils. Also included in this unit are soils that are similar to Fripp sand but have a water table at a depth of 20 to 40 inches for 2 to 6 months during most years.

The natural vegetation is stunted sand pine, sea oats, switchgrass, rosemary, reindeer lichen, scrub live oak, and palmetto.

**52- Bayvi loamy sand.** This level or nearly level, very poorly drained soil is in the tidal marshes and is inundated daily by normal high tides. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is very dark gray sand or loamy sand about 28 inches thick. It is underlain by a mixture of dark gray and gray sand or loamy sand to a depth of 80 inches or more. Salt content is high in all layers.

Included with this soil in mapping are small areas of Hydraquents similar to this Bayvi soil. Also included are small areas of soils that have an organic surface layer more than 10 inches thick. Included soils make up less than 25 percent of any map area.

This Bayvi soil has a water table at a depth of less than 10 inches, or the soil is ponded for 6 to 12 months during most years. This soil is subject to tidal flooding. Available water capacity is low. Permeability is rapid or very rapid in all layers. Internal drainage is very slow because of the high water table. Natural fertility is low. Organic matter content is high in the surface layer and is low in the lower layers.

The natural vegetation is dominantly needlegrass rushes and cordgrasses.

**55-Beaches.** Beaches are narrow strips of tide washed sand along the Gulf of Mexico. The sand is white and has few to common heavy minerals. Beaches range from 200 to 500 feet in width. As much as half of the beach can be covered by saltwater daily by high tide and wave action, and all of it can be covered during storms. The shape and slope of the beaches commonly change with every storm. Most areas have a uniform gently slope, but a short, stronger slope is at the water's edge. Beaches generally have no vegetation, but inland edges are sometimes sparsely covered with sea oats.

The high water table ranges from the surface to a depth of 4 feet or more. The depth varies depending on distance from the water, height of the beach, effect of storms, and time of year. Permeability is very rapid.

## **St. Andrews State Park Soils Descriptions**

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Included in mapping are sand dunes on the north side. The dunes are generally Newhan and Corolla soils. They are not subject to wave action except during storms, but they commonly receive salt spray.

Beaches are not suited to use for cultivated crops, pasture, or woodland. They are mainly suited as habitat for wildlife and to recreational use.

**99-Water.** Areas mapped as water represent various basin soils and overlying organic materials comprising lakebeds. They occur within the coastal dune lakes.

## **Addendum 5—Plant and Animal List**



## PTERIDOPHYTES

Swamp fern.....	<i>Blechnum serrulatum</i>
Bracken fern.....	<i>Pteridium aquilinum</i>
Japanese climbing fern.....	<i>Lygodium japonicum</i> *
Cinnamon fern.....	<i>Osmunda cinnamomea</i>
Royal Fern.....	<i>Osmunda regalis</i>
Virginia chain fern.....	<i>Woodwardia virginica</i>

## GYMNOSPERMS

Red Cedar.....	<i>Juniperus virginiana</i>
Choctawhatchee sand pine.....	<i>Pinus clausa</i> var. <i>Choctawhatchee</i>
North Florida slash pine.....	<i>Pinus elliotii</i> var. <i>elliotii</i>

## ANGIOSPERMS

### MONOCOTS

Meadow garlic.....	<i>Allium canadense</i>
Purple Bluestem.....	<i>Andropogon glomeratus</i> var. <i>glaucoptis</i>
Bushy Bluestem.....	<i>Andropogon glomeratus</i> var. <i>pumilus</i>
Broomsedge bluestem.....	<i>Andropogon virginicus</i>
Arrowfeather threeawn.....	<i>Aristida purpurascens</i>
Wiregrass.....	<i>Aristida stricta</i>
Capillary hairsedge.....	<i>Bulbostylis ciliatifolia</i>
Greenwhite sedge.....	<i>Carex albolutescens</i>
Fescue sedge.....	<i>Carex festucacea</i>
Coastal sandbur.....	<i>Cenchrus spinifex</i>
Sanddune sandbur.....	<i>Cenchrus tribuloides</i>
Jamaica swamp sawgrass.....	<i>Cladium jamaicense</i>
Poorland flatsedge.....	<i>Cyperus compressus</i>
Baldwin's flatsedge.....	<i>Cyperus croceus</i>
Leconte's flatsedge.....	<i>Cyperus lecontei</i>
Fragrant flatsedge.....	<i>Cyperus odoratus</i>
Tropical flatsedge.....	<i>Cyperus surinamensis</i>
Cypress panicgrass.....	<i>Dichantherium dichotomum</i>
Rough witchgrass.....	<i>Dichantherium leucothrix</i>
Saltgrass.....	<i>Distichlis spicata</i>
Southern Crabgrass.....	<i>Digitaria ciliaris</i>
Durban crowfootgrass.....	<i>Dactyloctenium aegyptium</i>
Coast cockspur.....	<i>Echinochloa walteri</i>
Gulf coast spikerush.....	<i>Eleocharis cellulosa</i>
Jointed Spikerush.....	<i>Eleocharis equisetoides</i>
Canada spikerush.....	<i>Eleocharis geniculata</i>
Robbins' spikerush.....	<i>Eleocharis robbinsii</i>
Indian goosegrass.....	<i>Eleusine indica</i>
Red Lovegrass.....	<i>Eragrostis secundiflora oxylepis</i>
Purple Lovegrass.....	<i>Eragrostis spectabilis</i>

\*Non-native Species

Pinewoods fingergrass.....	<i>Digitaria ciliaris</i>
Carolina fimbry .....	<i>Fimbristylis caroliniana</i>
Marsh fimbry .....	<i>Fimbristylis caroliniana</i>
Southern Umbrella-grass.....	<i>Fuirena scirpoidea</i>
Little Barley.....	<i>Hordeum pusillum</i>
Shoalweed .....	<i>Halodule wrightii</i>
Seagrasses.....	<i>Halophila spp</i>
Cogongrass .....	<i>Imperata cylindrical*</i>
Bighead rush .....	<i>Juncus megacephalus</i>
Stout rush .....	<i>Juncus nodatus</i>
Black Rush, Needlerush .....	<i>Juncus roemerianus</i>
Pathrush .....	<i>Juncus tenuis</i>
Shortleaf spikesedge.....	<i>Kyllinga brevifolius</i>
Carolina redroot .....	<i>Lachnanthes carolina</i>
Dotted duckweed .....	<i>Landoltia punctata</i>
Valdivia duckweed.....	<i>Lemna valdiviana</i>
Hairawn muhly.....	<i>Muhlenbergia capillaris</i>
Southern waternymph.....	<i>Najas guadalupensis</i>
Bitter panicgrass .....	<i>Panicum amarum</i>
Maidencane .....	<i>Panicum hemitomon</i>
Torpedo Grass .....	<i>Panicum repens*</i>
Hemlock witchgrass .....	<i>Panicum portoricense</i>
Redtop Panicum .....	<i>Panicum rigidulum</i>
Switchgrass.....	<i>Panicum virgatum</i>
Narrowleaf silkgrass.....	<i>Pityopsis graminifolia</i>
Rose natalgrass .....	<i>Melinis repens *</i>
Starrush whitetop.....	<i>Rhynchospora colorata</i>
Shortbristle horned beaksedge ..	<i>Rhynchospora corniculata</i>
Swampforest beaksedge .....	<i>Rhynchospora decurrens</i>
Spreading beaksedge .....	<i>Rhynchospora divergens</i>
Fascicled beaksedge .....	<i>Rhynchospora fascicularis</i>
Fernald's beaksedge .....	<i>Rhynchospora fernaldii</i>
Narrowfruit horned beaksedge...	<i>Rhynchospora inundata</i>
Sandyfield beaksedge.....	<i>Rhynchospora megalocarpa</i>
Southern beaksedge.....	<i>Rhynchospora microcarpa</i>
Shortbeak beaksedge, Baldrush.	<i>Rhynchospora nitens</i>
Tracy's beaksedge.....	<i>Rhynchospora tracyi</i>
Wright's beaksedge .....	<i>Rhynchospora wrightiana</i>
Cabbage Palm.....	<i>Sabal palmetto</i>
American cupscale .....	<i>Sacciolepis striata</i>
Bulltongue arrowhead.....	<i>Sagittaria lancifolia</i>
Gulf coast bluestem.....	<i>Schizachyrium maritimum</i>
Little bluestem.....	<i>Schizachyrium scoparium</i>
Woolgrass .....	<i>Scirpus cyperinus</i>
Fringed nutrush .....	<i>Scleria ciliata</i>
Netted nutrush .....	<i>Scleria reticularis</i>
Tall nutrush.....	<i>Scleria triglomerata</i>
Saw Palmetto .....	<i>Serenoa repens</i>



Yellow bristlegrass.....	<i>Setaria parviflora</i>
Annual blue-eyed grass .....	<i>Sisyrinchium rosulatum</i>
Earleaf greenbrier .....	<i>Smilax auriculata</i>
Saw greenbrier .....	<i>Smilax bona-nox</i>
Saltmarsh cordgrass.....	<i>Spartina alterniflora</i>
Saltmeadow cordgrass.....	<i>Spartina patens</i>
Gulf cordgrass .....	<i>Spartina spartinae</i>
Seashore dropseed.....	<i>Sporobolus virginicus</i>
Yellow hatpins .....	<i>Syngonanthus flavidulus</i>
Manateegrass .....	<i>Syringodium filiforme</i>
Turtlegrass .....	<i>Thalassia testudinum</i>
Spanish moss .....	<i>Tillandsia usneoides</i>
Common Spiderwort.....	<i>Tradescantia ohiensis</i>
Arrowgrass .....	<i>Triglochin striata</i>
Small venus' looking-glass .....	<i>Triodanis biflora</i>
Purple sandgrass.....	<i>Triplasis purpurea</i>
Southern cattail .....	<i>Typha domingensis</i>
Broadleaf cattail.....	<i>Typha latifolia</i>
Seaoads .....	<i>Uniola paniculata</i>
Sixweeks fescue.....	<i>Vulpia octoflora</i>
Yelloweyed grass .....	<i>Xyris spp.</i>
Spanish bayonet .....	<i>Yucca aloifolia</i>

## DICOTS

Slender three-seeded mercury...	<i>Acalypha gracilens</i>
Beach false-foxglove .....	<i>Agalinis fasciculata</i>
Seminole foxglove .....	<i>Agalinis filifolia</i>
Common ragweed .....	<i>Ambrosia artemisiifolia</i>
Peppervine .....	<i>Ampelopsis arborea</i>
Thymeleaf sandwort .....	<i>Arenaria serpyllifolia</i>
Red chokeberry.....	<i>Aronia arbutifolia</i>
Pinewoods milkweed .....	<i>Asclepias humistrata</i>
Saltwater falsewillow .....	<i>Baccharis angustifolia</i>
Groundsel tree.....	<i>Baccharis halimifolia</i>
Water hyssop, herb of grace.....	<i>Bocopa monnieri</i>
Yellow buttons .....	<i>Balduina angustifolia</i>
Saltwort .....	<i>Batis maritima</i>
Beggarstick .....	<i>Bidens alba</i>
Bushy seaside oxeye .....	<i>Borrchia frutescens</i>
American bluehearts.....	<i>Buchnera americana</i>
Coastal sea rocket .....	<i>Cakile lanceolata</i>
American beautyberry .....	<i>Callicarpa americana</i>
Vanilla leaf .....	<i>Carphephorus odoratissimus</i>
Hairy chaffhead.....	<i>Carphephorus paniculatus</i>
Wild olive .....	<i>Cartrema americana</i>
Pennywort, Spadeleaf.....	<i>Centella asiatica</i>
Spurred butterfly pea .....	<i>Centrosema virginianum</i>
Common buttonbush .....	<i>Cephalanthus occidentalis</i>

Mouse-ear chickweed .....	<i>Cerastium glomeratum</i>	
Florida rosemary .....	<i>Ceratiola ericoides</i>	
Partridge pea .....	<i>Chamaecrista fasciculata</i>	
Sensitive pea .....	<i>Chamaecrista nictitans</i>	
Hyssopleaf sandmat .....	<i>Chamaesyce hyssopifolia</i>	
Dixie sandmat .....	<i>Chamaesyce bombensis</i>	
Lamb's quarters .....	<i>Chenopodium album</i>	
Mexican tea .....	<i>Chenopodium ambrosioides</i>	
Woody goldenrod .....	<i>Chrysoma pauciflosculosa</i>	
Cruise's goldenaster .....	<i>Chrysopsis gossypina cruiseana</i> .....	BD, CG
Godfrey's goldenaster .....	<i>Chrysopsis godfreyi</i> .....	BD, CG
Lynn Haven goldenaster .....	<i>Chrysopsis lanuginosa</i>	
Tread softly .....	<i>Cnidocolus stimulosus</i>	
Whitemouth dayflower .....	<i>Commelina erecta</i>	
False rosemary .....	<i>Conradina canescens</i>	
Canadian horseweed .....	<i>Conyza canadensis</i>	
Slender scratchdaisy .....	<i>Croptilon divaricatum</i>	
Rabbitbells .....	<i>Crotalaria rotundifolia</i>	
Vente conmigo .....	<i>Croton glandulosus floridanus</i>	
Gulf croton, Beach tea .....	<i>Croton punctatus</i>	
Rushfoil .....	<i>Crotonopsis michauxii</i>	
Fiveangled dodder .....	<i>Cuscuta pentagona</i>	
Gulf coast swallowwort .....	<i>Cynanchum angustifolium</i>	
Ti-ti .....	<i>Cyrilla racemiflora</i>	
Dillenius' ticktrefoil .....	<i>Desmodium glabellum</i>	
Velvetleaf ticktrefoil .....	<i>Desmodium viridiflorum</i>	
Poor Joe, rough buttonweed .....	<i>Diodia teres</i>	
Virginia buttonweed .....	<i>Diodia virginiana</i>	
False daisy .....	<i>Eclipta prostrata</i>	
American burnweed, Fireweed ...	<i>Erechtites hieraciifolius</i>	
Oakleaf fleabane .....	<i>Erigeron quercifolius</i>	
Prarie fleabane .....	<i>Erigeron strigosus</i>	
Flattened pipewort .....	<i>Eriocaulon compressum</i>	
Narrow pipewort .....	<i>Eriocaulon lineare</i>	
Coralbean .....	<i>Erythrina herbacea</i>	
White thoroughwort .....	<i>Eupatorium album</i>	
Dog fennel .....	<i>Eupatorium capillifolium</i>	
Yankeeweed .....	<i>Eupatorium compositifolium</i>	
False fennel .....	<i>Eupatorium leptophyllum</i>	
Lateflowering thoroughwort .....	<i>Eupatorium serotinum</i>	
Paintedleaf .....	<i>Poinsettia cyathophora</i>	
Slender flattop goldenrod .....	<i>Euthamia caroliniana</i>	
Silver dwarf morning glory .....	<i>Evolvulus sericeus</i>	
Cottonweed .....	<i>Froelichia floridana</i>	
Elliot's milkpea .....	<i>Galactia elliotii</i>	
Eastern milkpea .....	<i>Galactia volubilis</i>	
Wholly huckleberry .....	<i>Gaylussacia mosieri</i>	
Carolina cranesbill .....	<i>Geranium carolinianum</i>	

Pennsylvania everlasting .....	<i>Gnaphalium pensilvanicum</i>
Spoonleaf purple everlasting .....	<i>Gamochoeta purpurea</i>
Rough hedgehyssop .....	<i>Gratiola hispida</i>
Southern beeblossom .....	<i>Gaura angustifolia</i>
Coastland frostweed .....	<i>Helianthemum arenicola</i>
Pinebarren frostweed.....	<i>Helianthemum corymbosum</i>
Camphorweed .....	<i>Heterotheca subaxillaris</i>
Innocence .....	<i>Houstonia procumbens</i>
Largeleaf marshpennywort .....	<i>Hydrocotyle bonariensis</i>
Coastalplain St. John's-wort .....	<i>Hypericum brachyphyllum</i>
Apalachicola St. John's-wort .....	<i>Hypericum chapmanii</i>
Peelbark St. John's-wort .....	<i>Hypericum fasciculatum</i>
Pineweeds, orangegrass.....	<i>Hypericum gentianoides</i>
St. Andrew's cross.....	<i>Hypericum hypericoides</i>
Flatwoods St. John's-wort .....	<i>Hypericum microsepalum</i>
Atlantic St. John's-wort.....	<i>Hypericum tenuifolium</i>
Fourpetal St. John's-wort .....	<i>Hypericum tetrapetalum</i>
Dahoon.....	<i>Ilex cassine</i>
Gallberry .....	<i>Ilex glabra</i>
Yaupon .....	<i>Ilex vomitoria</i>
Carolina indigo.....	<i>Indigofera caroliniana</i>
Hairy indigo.....	<i>Indigofera hirsuta</i>
Beach morning glory .....	<i>Ipomoea imperati</i>
Railroad vine .....	<i>Ipomoea pes-caprae</i>
Saltmarsh morning Glory .....	<i>Ipomoea sagittata</i>
Bigleaf sumpweed .....	<i>Iva frutescens</i>
Seacoast marshelder .....	<i>Iva imbricata</i>
Hairy laurel .....	<i>Kalmia hirsuta</i>
Virginia saltmarsh mallow .....	<i>Kosteletzkya pentacarpos</i>
Dwarf dandelion.....	<i>Krigia virginica</i>
Lantana .....	<i>Lantana camara*</i>
Virginia pepperweed .....	<i>Lepidium virginicum</i>
Pinkscale gayfeather.....	<i>Liatris elegans</i>
Shortleaf gayfeather .....	<i>Liatris tenuifolia</i>
Gopher Apple.....	<i>Licania michauxi</i>
Carolina sealavender .....	<i>Limonium carolinianum</i>
Candian toadflax .....	<i>Linaria canadensis</i>
Apalachicola toadflax .....	<i>Linaria floridana</i>
Texas toadflax .....	<i>Linaria texana</i>
Stiff yellow flax .....	<i>Linum medium</i>
Winged primrose.....	<i>Ludwigia alata</i>
Seaside primrosewillow.....	<i>Ludwigia maritima</i>
Rusty Lyonia, Staggerbush.....	<i>Lyonia ferruginea</i>
Fetterbush.....	<i>Lyonia lucida</i>
Wand loosestrife .....	<i>Lythrum lineare</i>
Southern Magnolia .....	<i>Magnolia grandiflora</i>
Sweet Bay .....	<i>Magnolia virginiana</i>
Black Medic .....	<i>Medicago lupulina</i>

Climbing Hempvine .....	<i>Mikania scandens</i>
Spotted Beebalm .....	<i>Monarda punctata</i>
Wax myrtle .....	<i>Myrica cerifera</i>
Cutleaf watermilfoil .....	<i>Myriophyllum pinnatum</i>
Spatterdock, yellow pond-lilly ....	<i>Nuphar advenda</i>
Fragrant Water-lily .....	<i>Nymphaea odorata</i>
Floating hearts.....	<i>Nymphoides cordata</i>
Seabeach Evening Primrose .....	<i>Oenothera humifusa</i>
Cutleaf evening primrose .....	<i>Oenothera laciniata</i>
Clustered mille grains .....	<i>Oldenlandia uniflora</i>
Prickly Pear .....	<i>Opuntia humifusa</i>
Common yellow woodsorrel.....	<i>Oxalis corniculata</i>
Tufted yellow woodsorrel .....	<i>Oxalis macrantha</i>
Squareflower, Sand Squares .....	<i>Paronychia erecta</i>
Virginia Creeper .....	<i>Parthenocissus quinquefolia</i>
Thin paspalum .....	<i>Paspalum setaceum</i>
Purple passionflower, Maypops ..	<i>Passiflora incarnata</i>
Swamp Bay .....	<i>Persea palustris</i>
Red Bay .....	<i>Persea borbonia</i>
Capweed .....	<i>Phyla nodiflora</i>
Coastal ground cherry .....	<i>Physalis angustifolia</i>
American pokeweed .....	<i>Phytolacca americana</i>
Southern Plantain.....	<i>Plantago virginica</i>
Wright's Plantain .....	<i>Plantago wrightiana</i>
Stinking camphorweed .....	<i>Pluchea foetida</i>
Sweetscent.....	<i>Pluchea odorata</i>
Rosy camphorweed .....	<i>Pluchea baccharis</i>
Littleleaf milkwort .....	<i>Polygala brevifolia</i>
Showy milkwort .....	<i>Polygala grandiflora</i>
October flower .....	<i>Polygonella polygama</i>
Mild waterpepper .....	<i>Polygonum hydropiperoides</i>
Dotted Smartweed .....	<i>Polygonum punctatum</i>
Bog smartweed.....	<i>Polygonum setaceum</i>
Rustweed .....	<i>Polypremum procumbens</i>
Pickerelweed .....	<i>Pontederia cordata</i>
Pink Purslane .....	<i>Portulaca pilosa</i>
Combleaf mermaidweed .....	<i>Proserpinaca pectinata</i>
Chickasaw Plum .....	<i>Prunus angustifolia</i>
Black Cherry .....	<i>Prunus serotina</i>
Blackroot.....	<i>Pterocaulon pycnostachyum</i>
Mock Bishop's-weed .....	<i>Ptilimnium capillaceum</i>
Carolina desertchicory .....	<i>Pyrrhopappus carolinianus</i>
Sand Live Oak .....	<i>Quercus geminata</i>
Myrtle Oak .....	<i>Quercus myrtifolia</i>
Live Oak.....	<i>Quercus virginiana</i>
Meadow Beauty .....	<i>Rhexia cubensis</i>
Winged Sumac.....	<i>Rhus copallinum</i>
Southern dewberry.....	<i>Rubus trivialis</i>

Heartwing dock.....	<i>Rumex hastatulus</i>
Shortleaf rosegiant .....	<i>Sabatia brevifolia</i>
Rose of Plymouth, Marsh Pink....	<i>Sabatia stellaris</i>
American glasswort, pickleweed	<i>Salicornia virginica</i>
Coastalplain willow .....	<i>Salix caroliniana</i>
Black willow.....	<i>Salix nigra</i>
Popcorn Tree, Chinese Tallow ....	<i>Sapium sebiferum*</i>
Coffeeweed, Sicklepod.....	<i>Senna obtusifolia</i>
Purple sesban, rattlebox .....	<i>Sesbania punicea*</i>
Bladderpod.....	<i>Sesbania vesicaria</i>
Shoreline seapurslane.....	<i>Sesuvium portulacastrum</i>
Yaupon blackenna.....	<i>Seymeria cassioides</i>
Indian hemp.....	<i>Sida rhombifolia</i>
Gum bully .....	<i>Sideroxylon lanuginosum</i>
American black nightshade.....	<i>Solanum americanum</i>
Chapman's goldenrod .....	<i>Solidago odora chapmanii</i>
Sweet goldenrod .....	<i>Solidago odora</i>
Seaside Goldenrod .....	<i>Solidago sempervirens</i>
Wand goldenrod.....	<i>Solidago stricta</i>
Twisted leaf goldenrod.....	<i>Solidago tortifolia</i>
Bristly scaleseed .....	<i>Spermolepis echinata</i>
Diamondflowers .....	<i>Stenaria nigricans</i>
Trailing fuzzybean .....	<i>Strophostyles helvola</i>
Annual saltmarsh aster .....	<i>Symphyotrichum subulatum</i>
Perennial saltmarsh aster.....	<i>Symphyotrichum tenuifolium</i>
Eastern poison ivy .....	<i>Toxicodendron radicans</i>
Virginia marsh St. John's-wort ...	<i>Triadenum virginicum</i>
Humped bladderwort .....	<i>Utricularia gibba</i>
Eastern purple bladderwort .....	<i>Utricularia purpurea</i>
Zigzag bladderwort .....	<i>Utricularia subulata</i>
Highbush blueberry .....	<i>Vaccinium corymbosum</i>
Darrow's blueberry .....	<i>Vaccinium darrowii</i>
Muscadine .....	<i>Vitis rotundifolia</i>

## St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
<b>CRUSTACEANS</b>		
Common blue crab .....	<i>Callinectes sapidus</i> .....	EUS, MUS, MSGB
Striped hermit crab .....	<i>Clibanaius vittatus</i> .....	EUS, MUS
Star-eyed hermit crab .....	<i>Dardanus venosus</i> .....	EUS, MUS
Atlantic mole crab .....	<i>Emerita talpoida</i> .....	MUS
Horseshoe crab .....	<i>Limulus polyphemus</i> .....	EUS, MSGB
Ghost crab .....	<i>Ocypode quadrata</i> .....	MTC
Fiddler crab .....	<i>Uca spp.</i> .....	EUS, SAM, CIS
<b>GASTROPODS</b>		
Lightning whelk. ....	<i>Busycon contrarium</i> .....	EUS, MUS, MSGB
Pear whelk. ....	<i>Busycon spiratum</i> .....	EUS, MUS, MSGB
Cancellate cantharus .....	<i>Cantharus cancellarius</i> .....	EUS, MUS, MSGB
Florida cone. ....	<i>Conus floridanus</i> .....	EUS, MUS, MSGB
Jasper cone .....	<i>Conus jaspideus</i> .....	EUS, MUS, MSGB
Pitted murex .....	<i>Favartia cellulosa</i> .....	EUS, MUS, MSGB
Banded tulip .....	<i>Fasciolaria liliium huntera</i> .....	EUS, MUS, MSGB
True tulip. ....	<i>Fasciolaria tulipa</i> .....	EUS, MUS, MSGB
Marsh periwinkle .....	<i>Littoraria irrorata</i> .....	SAM
Crown conch. ....	<i>Melongena corona</i> .....	EUS, MUS, MSGB
Lace murex. ....	<i>Murex florifer</i> .....	EUS, MUS, MSGB
Giant eastern murex .....	<i>Murex fulvescens</i> .....	EUS, MUS, MSGB
Florida horse conch .....	<i>Pleuroploca gigantea</i> .....	EUS, MUS, MSGB
Shark's eye .....	<i>Polinices duplicatus</i> .....	EUS, MUS, MSGB
Common baby's ear .....	<i>Sinum perspectivum</i> .....	EUS, MUS, MSGB
Gulf oyster drill .....	<i>Urosalpinx perrugata</i> .....	EUS, MUS, MSGB
<b>PELYCYPODS</b>		
Stiff pen shell .....	<i>Atrina rigida</i> .....	EUS, MUS, MSGB
Bay scallop .....	<i>Irradians concentricus</i> .....	MSGB
Sunray venus .....	<i>Macrocallista nimbosa</i> .....	EUS, MUS, MSGB
Southern qahahog .....	<i>Mercenaria campechiensis</i> .....	EUS, MUS, MSGB
<b>CEPHALOPODS</b>		
Joubin's octopus .....	<i>Octopus joubin</i> .....	EUS, MUS, MSGB
Common Atlantic octopus .....	<i>Octopus vulgaris</i> .....	EUS, MUS, MSGB
<b>HYDROZOANS</b>		
Sea nettle .....	<i>Chrysaora quinquecirrha</i> .....	EUS, MUS, MSGB
Portuguese man-o-war .....	<i>Physalia physalis</i> .....	EUS, MUS, MSGB
Blue buttons .....	<i>Porpita linneana</i> .....	EUS, MUS, MSGB
Cannonball jellyfish .....	<i>Stomolophus meleagris</i> .....	EUS, MUS, MSGB

\*Non-native Species

St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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**BEETLES**

Three-lined tiger beetle .....	<i>Cicindela trifasciata ascendens</i> .....	CIS, EUS
Coastal tiger beetle .....	<i>Cicindela hamata</i> .....	CDLK, CIS, MUS
Eastern beach tiger beetle.....	<i>Cicindela dorsalis saulcyi</i> .....	BD, CIS, MUS, EUS
Soft-winged flower Beetle .....	<i>Collops tricolor</i> .....	BD, CG
Saltmarsh tiger beetle .....	<i>Cicindela marginata</i> .....	SAM
Underfoot tiny sand-loving scarab beetle.....	<i>Geopsammodius subpedalis</i> .....	BD
Woodruff's polyphyllan scarab beetle.....	<i>Polyphylla woodruffi</i> .....	BD

**ANTS, BEES AND WASPS**

Gulf Coast Solitary Bee.....	<i>Hesperapis oraria</i> .....	BD, CG, SC
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**SPIDERS**

Santa Rosa Wolf Spider .....	<i>Arctosa sanctaerosae</i> .....	BD
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St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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**AMPHIBIANS**

Southern cricket frog	<i>Acris gryllus</i>	BM, MF
Oak toad	<i>Anaxyrus quercicus</i>	MTC
Southern toad	<i>Anaxyrus terrestris</i>	MTC
Green treefrog	<i>Hyla cinerea</i>	BM, MF, DV
Pine woods treefrog	<i>Hyla femoralis</i>	BM, MF
Barking treefrog	<i>Hyla gratiosa</i>	BM, MF
Squirrel treefrog	<i>Hyla squirella</i>	BM, MF
Bronze frog	<i>Lithobates clamitans clamitans</i>	MTC
Southern leopard frog	<i>Lithobates sphenoccephalus</i>	MTC
Southern spring peeper	<i>Pseudacris crucifer</i>	MTC
Little grass frog	<i>Pseudacris ocularis</i>	BM, MF
Southern chorus frog	<i>Pseudacris nigrita nigrita</i>	BM
Eastern spadefoot	<i>Scaphiopus holbrookii</i>	BM, MF
Two-toed amphiuma	<i>Amphiuma means</i>	BM, MF
Dwarf salamander	<i>Eurycea quadridigitata</i>	BM, MF
Central newt	<i>Notophthalmus viridescens louisianensis</i>	BM, MF
Lesser siren	<i>Siren lacertina</i>	BM, MF

**REPTILES**

American alligator	<i>Alligator mississippiensis</i>	BM, CDLK
Florida softshell turtle	<i>Apalone ferox</i>	BM, MF
Loggerhead sea turtle	<i>Caretta caretta</i>	BD, MUS, ESGB
Green sea turtle	<i>Chelonia mydas</i>	BD, MUS, ESGB
Eastern snapping turtle	<i>Chelydra serpentina serpentina</i>	BM, MF, CDLK
Leatherback sea turtle	<i>Dermodochelys coriacea</i>	BD, MUS, ESGB
Chicken turtle	<i>Deirochelys reticularia reticularia</i>	BM, MF
Gopher tortoise	<i>Gopherus polyphemus</i>	BD, SC, MF
Eastern mud turtle	<i>Kinosternon subrubrum subrubrum</i>	BM, MF
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	BD, MUS, ESGB
Ornate diamondback terrapin	<i>Malaclemys terrapin macrospilota</i>	MTC
Florida cooter	<i>Pseudemys floridana floridana</i>	BM, MF, CDLK
Eastern musk turtle	<i>Sternotherus odoratus</i>	BM, MF, CDLK
Gulf coast box turtle	<i>Terrapene carolina major</i>	BM, MF, CDLK
Yellow-bellied slider	<i>Trachemys scripta scripta</i> *	BM, MF, CDLK
Green anole	<i>Anolis carolinensis carolinensis</i>	MTC
Six-lined racerunner	<i>Aspidoscelis sexlineatus sexlineatus</i>	MTC
Slender glass lizard	<i>Ophisaurus attenuatus</i>	BM, MF, SC
Eastern glass lizard	<i>Ophisaurus ventralis</i>	BM, MF, SC
Five-lined skink	<i>Plestiodon fasciatus</i>	MTC
Southeastern five-lined skink	<i>Plestiodon inexpectatus</i>	MTC
Broad-headed skink	<i>Plestiodon laticeps</i>	MTC
Southern fence lizard	<i>Sceloporus undulatus undulatus</i>	MTC
Little brown skink	<i>Scincella lateralis</i>	MTC

\*Non-native Species



**St. Andrews State Park Animals**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
Florida cottonmouth.....	<i>Agkistrodon piscivorus conanti</i> .....	MTC
Northern scarlet snake .....	<i>Cemophora coccinea copei</i> .....	MTC
Southern black racer.....	<i>Coluber constrictor priapus</i> .....	MTC
Eastern coachwhip.....	<i>Coluber flagellum flagellum</i> .....	MTC
Eastern diamondback rattlesnake...	<i>Crotalus adamanteus</i> .....	MTC
Southern ring-necked snake .....	<i>Diadophis punctatus punctatus</i> .....	MTC
Eastern mud snake .....	<i>Farancia abacura</i> .....	BM, MF
Eastern hognose snake .....	<i>Heterodon platirhinos</i> .....	MTC
Scarlet kingsnake .....	<i>Lampropeltis elapsoides</i> .....	MTC
Eastern kingsnake .....	<i>Lampropeltis getulus getulus</i> .....	MTC
Harlequin coral snake.....	<i>Micrurus fulvius</i> .....	MF, SC, MAH
Gulf salt marsh snake .....	<i>Nerodia clarkii clarkii</i> .....	SAM
Banded water snake .....	<i>Nerodia fasciata fasciata</i> .....	BM, MF
Brown water snake .....	<i>Nerodia taxispilota</i> .....	BM, MF
Rough green snake .....	<i>Opheodrys aestivus</i> .....	BM, MF
Red cornsnake .....	<i>Pantherophis guttatus</i> .....	MTC
Gray rat snake .....	<i>Pantherophis spiloides</i> .....	MTC
Glossy crayfish snake.....	<i>Regina rigida</i> .....	BM, MF
Pine woods litter snake.....	<i>Rhadinaea flavilata</i> .....	MF
Dusky pygmy rattlesnake .....	<i>Sistrurus miliarius barbouri</i> .....	MTC
Florida red-bellied snake.....	<i>Storeria occipitomaculata obscura</i> .....	BM, MF
Southeastern crowned snake ....	<i>Tantilla coronata</i> .....	MF, SC
Common ribbon snake .....	<i>Thamnophis sauritus sauritus</i> .....	BM, CDLK, SAM
Eastern garter snake.....	<i>Thamnophis sirtalis sirtalis</i> .....	MTC
Rough earth snake .....	<i>Virginia striatula</i> .....	MF, MAH, SC

St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
<b>BIRDS</b>		
Canada goose.....	<i>Branta canadensis</i> .....	OF
Snow goose.....	<i>Chen caerulescens</i> .....	OF
Wood duck .....	<i>Aix sponsa</i> .....	BM, BS, CDLK
Northern pintail .....	<i>Anas acuta</i> .....	MTC
American wigeon .....	<i>Anas americana</i> .....	BM, CDLK
Green-winged teal.....	<i>Anas carolinensis</i> .....	BM, CDLK
Northern shovler .....	<i>Anas clypeata</i> .....	AW, CDLK
Blue-winged teal .....	<i>Anas discors</i> .....	BM, CDLK
Mallard .....	<i>Anas platyrhynchos</i> .....	MTC
American black duck .....	<i>Anas rubripes</i> .....	BM, CDLK
Gadwall .....	<i>Anas strepera</i> .....	BM, CDLK
Lesser scaup .....	<i>Aythya affinis</i> .....	AW, CDLK
Redhead .....	<i>Aythya americana</i> .....	AW, CDLK
Ring-necked duck .....	<i>Aythya collaris</i> .....	AW, CDLK
Greater scaup.....	<i>Aythya marila</i> .....	AW, CDLK
Canvasback.....	<i>Aythya valisineria</i> .....	AW, CDLK
Bufflehead .....	<i>Bucephala albeola</i> .....	AW, CDLK
Common goldeneye.....	<i>Bucephala clangula</i> .....	AW, CDLK
Long-tailed duck .....	<i>Clangula hyemalis</i> .....	AW, CDLK
Harlequin duck .....	<i>Histrionicus histrionicus</i> .....	AW, CDLK
Hooded merganser .....	<i>Lophodytes cucullatus</i> .....	AW, BM, CDLK
Black scoter .....	<i>Melanitta americana</i> .....	AW
White-winged scoter.....	<i>Melanitta deglandi</i> .....	AW
Surf scoter .....	<i>Melanitta perspicillata</i> .....	AW
Red-breasted merganser.....	<i>Mergus serrator</i> .....	BM, CDLK, AW
Ruddy duck.....	<i>Oxyura jamaicensis</i> .....	AW, CDLK
Common loon.....	<i>Gavia immer</i> .....	AW
Red-throated loon .....	<i>Gavia stellata</i> .....	AW
Horned grebe .....	<i>Podiceps auritus</i> .....	AW, CDLK
Pied-billed grebe .....	<i>Podilymbus podiceps</i> .....	BM, CDLK
Great shearwater .....	<i>Puffinus gravis</i> .....	AW
Northern gannet .....	<i>Morus bassanus</i> .....	AW
Masked booby .....	<i>Sula dactylatra</i> .....	AW
Brown booby .....	<i>Sula leucogaster</i> .....	AW
Red-footed booby .....	<i>Sula sula</i> .....	AW
Brown pelican .....	<i>Pelecanus occidentalis</i> .....	AW, MUS, DV
American white pelican.....	<i>Pelecanus erythrorhynchos</i> .....	AW, OF
Double-crested cormorant.....	<i>Phalacrocorax auritus</i> .....	MUS, AW, DV
Great cormorant .....	<i>Phalacrocorax carbo</i> .....	MUS, AW, DV
Anhinga .....	<i>Anhinga anhinga</i> .....	BM, OF
Magnificent frigatebird .....	<i>Fregata magnificens</i> .....	OF, AW
Great egret .....	<i>Ardea alba</i> .....	MTC
Great blue heron.....	<i>Ardea herodias</i> .....	MTC
American bittern .....	<i>Botaurus lentiginosus</i> .....	BM, CDLK, SAM
Cattle egret.....	<i>Bubulcus ibis</i> .....	MTC
Green heron .....	<i>Butorides virescens</i> .....	BM, SAM

\*Non-native Species

St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Little blue heron.....	<i>Egretta caerulea</i> .....	BM, EUS, SAM
Reddish egret .....	<i>Egretta rufescens</i> .....	BM, EUS, MUS, SAM
Snowy egret .....	<i>Egretta thula</i> .....	MTC
Tricolored heron.....	<i>Egretta tricolor</i> .....	MTC
Least bittern.....	<i>Ixobrychus exilis</i> .....	SAM
Black-crowned night heron .....	<i>Nycticorax nycticorax</i> .....	BM, EUS, SAM
Yellow-crowned night heron ....	<i>Nyctanassa violacea</i> .....	BM, BD, EUS
White ibis.....	<i>Eudocimus albus</i> .....	MTC
Glossy ibis.....	<i>Plegadis falcinellus</i> .....	MTC
Roseate spoonbill .....	<i>Platalea ajaja</i> .....	EUS, SAM
Turkey vulture .....	<i>Cathartes aura</i> .....	OF
Black vulture .....	<i>Coragyps atratus</i> .....	OF
Osprey .....	<i>Pandion haliaetus</i> .....	MTC
Cooper's hawk .....	<i>Accipiter cooperii</i> .....	MTC
Sharp-shinned hawk.....	<i>Accipiter striatus</i> .....	MTC
Red-tailed hawk.....	<i>Buteo jamaicensis</i> .....	OF, MF, MAH
Red-shouldered hawk .....	<i>Buteo lineatus</i> .....	MTC
Broad-winged hawk.....	<i>Buteo platypterus</i> .....	OF
Northern harrier.....	<i>Circus cyaneus</i> .....	CG, SAM, BD
Swallow-tailed kite .....	<i>Elanoides forficatus</i> .....	OF
Bald eagle .....	<i>Haliaeetus leucocephalus</i> .....	MTC
Mississippi kite.....	<i>Ictinia mississippiensis</i> .....	OF
Merlin .....	<i>Falco columbarius</i> .....	MTC
Peregrine falcon.....	<i>Falco peregrinus</i> .....	MTC
Southeastern American kestrel .	<i>Falco sparverius paulus</i> .....	MTC
American coot .....	<i>Fulica americana</i> .....	BM, CDLK
Common gallinule .....	<i>Gallinula galeata</i> .....	BM, CDLK
Purple gallinule .....	<i>Porphyrio martinicus</i> .....	BM, CDLK
Sora .....	<i>Porzana carolina</i> .....	BM, CDLK, SAM
Clapper rail .....	<i>Rallus longirostris</i> .....	BM, CDLK, SAM
Virginia rail .....	<i>Rallus limicola</i> .....	BM, CDLK, SAM
Sandhill crane.....	<i>Grus canadensis</i> .....	OF
Piping plover .....	<i>Charadrius melodus</i> .....	BD, CDLK, EUS, MUS
Snowy plover .....	<i>Charadrius nivosus</i> .....	BD, CIS, CDLK, EUS, MUS
Semipalmated plover .....	<i>Charadrius semipalmatus</i> .....	BD, CIS, EUS, MUS
Killdeer .....	<i>Charadrius vociferus</i> .....	MTC
Wilson's plover .....	<i>Charadrius wilsonia</i> .....	BD, CG, CIS, EUS, MUS
American golden plover .....	<i>Pluvialis dominica</i> .....	BD, CG, CIS, CDLK, MUS
Black-bellied Plover .....	<i>Pluvialis squatarola</i> .....	BD, CIS, EUS, MUS
Black-necked stilt .....	<i>Himantopus mexicanus</i> ..	BD, CIS, CDLK, EUS, MUS
American avocet .....	<i>Recurvirostra americana</i> .	BD, CIS, CDLK, EUS, MUS
Spotted sandpiper.....	<i>Actitis macularius</i> .....	EUS, MUS
Ruddy turnstone .....	<i>Arenaria interpres</i> .....	BD, CIS, CDLK, EUS, MUS
Sanderling .....	<i>Calidris alba</i> .....	BD, CIS, CDLK, EUS, MUS
Dunlin .....	<i>Calidris alpina</i> .....	BD, CIS, CDLK, EUS, MUS
Bairds sandpiper .....	<i>Calidris bairdii</i> .....	BD, CIS, CDLK, EUS, MUS
Red knot.....	<i>Calidris canutus</i> .....	BD, MUS

\*Non-native Species

**St. Andrews State Park Animals**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
White-rumped sandpiper.....	<i>Calidris fuscicollis</i> .....	BD, CIS, CDLK, EUS, MUS
Western sandpiper .....	<i>Calidris mauri</i> .....	BD, CIS, CDLK, EUS, MUS
Pectoral sandpiper.....	<i>Calidris melanotos</i> .....	BD, CIS, CDLK, EUS, MUS
Least sandpiper .....	<i>Calidris minutilla</i> .....	BD, CIS, CDLK, EUS, MUS
Semipalmated sandpiper .....	<i>Calidris pusilla</i> .....	BD, CIS, CDLK, EUS, MUS
Wilson's snipe.....	<i>Gallinago delicata</i> .....	BM, SAM
Short-billed dowitcher .....	<i>Limnodromus griseus</i> .....	BD, CIS, CDLK, EUS, MUS
Long-billed dowitcher .....	<i>Limnodromus griseus</i> .....	BD, CIS, CDLK, EUS, MUS
Marbled godwit .....	<i>Limosa fedoa</i> .....	BD, CIS, CDLK, EUS, MUS
Long-billed curlew .....	<i>Numenius americanus</i> .....	BD, MUS
Whimbrel .....	<i>Numenius phaeopus</i> .....	BD, MUS
Wilson's phalarope .....	<i>Phalaropus tricolor</i> .....	BD, CIS, CDLK, EUS, MUS
Lesser yellowlegs .....	<i>Tringa flavipes</i> .....	BD, CIS, CDLK, EUS, MUS
Greater yellowlegs .....	<i>Tringa melanoleuca</i> .....	BD, CIS, CDLK, EUS, MUS
Western willet .....	<i>Tringa semipalmata inornata</i> .....	MTC
Eastern willet .....	<i>Tringa semipalmata semipalmata</i> .....	MTC
Solitary sandpiper .....	<i>Tringa solitaria</i> .....	BD, CIS, CDLK, EUS, MUS
Buff-breasted sandpiper.....	<i>Tryngites subruficollis</i> ....	BD, CIS, CDLK, EUS, MUS
Parasitic Jaeger .....	<i>Stercorarius parasiticus</i> .....	OF, MUS
Brown noddy .....	<i>Anous stolidus</i> .....	AW, MUS
Black tern .....	<i>Chlidonias niger</i> .....	BD, CDLK, MUS
Bonaparte's gull .....	<i>Chroicocephalus philadelphia</i> .....	EUS, AW, MUS
Gull-billed tern .....	<i>Gelochelidon nilotica</i> .....	BD, CIS, CDLK, EUS, MUS
Caspian tern .....	<i>Hydroprogne caspia</i> .....	EUS, MUS, AW
Laughing gull .....	<i>Leucophaeus atricilla</i> .....	MTC
Ring-billed gull .....	<i>Larus delawarensis</i> .....	MTC
Great black-backed gull .....	<i>Larus marinus</i> .....	MUS, EUS, AW
Herring gull .....	<i>Larus smithsonianus</i> .....	MTC
Bridled tern .....	<i>Onychoprion anaethetus</i> .....	AW, MUS
Sooty tern.....	<i>Onychoprion fuscatus</i> .....	AW, MUS
Least tern .....	<i>Sternula antillarum</i> .....	BD, CDLK, EUS, MUS, AW
Common tern .....	<i>Sterna hirundo</i> .....	BD, EUS, MUS, AW
Forster's tern.....	<i>Sterna forsteri</i> .....	BD, EUS, MUS, AW
Royal tern .....	<i>Thalasseus maximus</i> .....	BD, EUS, MUS, AW
Sandwich tern .....	<i>Thalasseus sandvicensis</i> .....	BD, EUS, MUS, AW
Black skimmer .....	<i>Rynchops niger</i> .....	BD, EUS, MUS, AW
Razorbill .....	<i>Alca torda</i> .....	AW
Rock pigeon .....	<i>Columba livia</i> * .....	MUS, DV
Common ground-dove .....	<i>Columbina passerina</i> .....	MTC
Eurasian collared dove.....	<i>Streptopelia decaocto</i> * .....	DV
White-winged dove .....	<i>Zenaida asiatica</i> * .....	DV
Mourning dove.....	<i>Zenaida macroura</i> .....	MTC
Yellow-billed cuckoo .....	<i>Coccyzus americanus</i> .....	CS, DV, MAH
Black-billed cuckoo.....	<i>Coccyzus erythrophthalmus</i> .....	CS, DV, MAH
Barred owl .....	<i>Strix varia</i> .....	MTC
Great horned owl .....	<i>Bubo virginianus</i> .....	MTC
Eastern screech-owl .....	<i>Megascops asio</i> .....	MTC

\*Non-native Species

St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Chuck-will's-widow	<i>Antrostomus carolinensis</i>	MTC
Whip-poor-will	<i>Antrostomus vociferus</i>	MTC
Common nighthawk	<i>Chordeiles minor</i>	MTC
Chimney swift	<i>Chaetura pelagica</i>	OF
Buff-bellied hummingbird	<i>Amazilia yucatanensis</i>	MTC
Ruby-throated hummingbird	<i>Archilochus colubris</i>	MTC
Black-chinned hummingbird	<i>Archilochus alexandri</i>	MTC
Rufous hummingbird	<i>Selasphorus rufus</i>	MTC
Belted kingfisher	<i>Megaceryle alcyon</i>	BM, CDLK, EUS, SAM
Northern flicker	<i>Colaptes auratus</i>	MTC
Pileated woodpecker	<i>Dryocopus pileatus</i>	MTC
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	MTC
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	MTC
Downy woodpecker	<i>Picoides pubescens</i>	MTC
Hairy woodpecker	<i>Picoides villosus</i>	MTC
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	MTC
Eastern wood-Pewee	<i>Contopus virens</i>	BM, MF, MAH
Least flycatcher	<i>Empidonax minimus</i>	BM, MF, MAH
Acadian flycatcher	<i>Empidonax virescens</i>	BM, MF, MAH
Great-crested flycatcher	<i>Myiarchus crinitus</i>	MTC
Eastern phoebe	<i>Sayornis phoebe</i>	MTC
Gray kingbird	<i>Tyrannus dominicensis</i>	DV, MF, RD, SC
Scissor-tailed flycatcher	<i>Tyrannus forficatus</i>	BM
Eastern kingbird	<i>Tyrannus tyrannus</i>	MTC
Western kingbird	<i>Tyrannus verticalis</i>	MTC
Loggerhead shrike	<i>Lanius ludovicianus</i>	MTC
Yellow-throated vireo	<i>Vireo flavifrons</i>	MAH, MF
White-eyed vireo	<i>Vireo griseus</i>	MAH, MF
Red-eyed vireo	<i>Vireo olivaceus</i>	MAH, MF
Blue-headed vireo	<i>Vireo solitarius</i>	MAH, MF
American crow	<i>Corvus brachyrhynchos</i>	MTC
Fish crow	<i>Corvus ossifragus</i>	BD, DV, MUS
Blue jay	<i>Cyanocitta cristata</i>	MTC
Barn swallow	<i>Hirundo rustica</i>	DV, OF
Purple martin	<i>Progne subis</i>	OF
Bank swallow	<i>Riparia riparia</i>	OF
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	OF
Tree swallow	<i>Tachycineta bicolor</i>	OF
Tufted titmouse	<i>Baeolophus bicolor</i>	MAH, MF
Carolina chickadee	<i>Poecile carolinensis</i>	MTC
Red-breasted nuthatch	<i>Sitta canadensis</i>	MF
Brown-headed nuthatch	<i>Sitta pusilla</i>	MTC
Brown creeper	<i>Certhia Americana</i>	MF
Marsh wren	<i>Cistothorus palustris</i>	BM, SAM
Sedge wren	<i>Cistothorus platensis</i>	BM, SAM
Carolina wren	<i>Thryothorus ludovicianus</i>	MTC
House wren	<i>Troglodytes aedon</i>	MTC

\*Non-native Species

## St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Ruby-crowned kinglet .....	<i>Regulus calendula</i> .....	MTC
Golden-crowned kinglet .....	<i>Regulus satrapa</i> .....	MTC
Blue-gray gnatcatcher .....	<i>Poliotilta caerulea</i> .....	MTC
Veery .....	<i>Catharus fuscescens</i> .....	MF, SC, MAH
Hermit thrush.....	<i>Catharus guttatus</i> .....	MTC
Gray-cheeked thrush .....	<i>Catharus minimus</i> .....	MF, SC, MAH
Swainson's thrush.....	<i>Catharus ustulatus</i> .....	MF, SC, MAH
Wood thrush.....	<i>Hylocichla mustelina</i> .....	MF, SC, MAH
Eastern bluebird .....	<i>Sialia sialis</i> .....	MTC
American robin .....	<i>Turdus migratorius</i> .....	MTC
Gray catbird .....	<i>Dumetella carolinensis</i> .....	MTC
Northern mockingbird.....	<i>Mimus polyglottos</i> .....	MTC
Brown thrasher.....	<i>Toxostoma rufum</i> .....	MTC
European starling.....	<i>Sturnus vulgaris</i> * .....	DV
American pipit .....	<i>Anthus rubescens</i> .....	EUS
Cedar waxwing .....	<i>Bombycilla cedrorum</i> .....	MTC
Canada warbler .....	<i>Cardellina canadensis</i> .....	BM, MAH, MF, SC
Wilson's warbler.....	<i>Cardellina pusilla</i> .....	BM, MAH, MF, SC
Kentucky warbler .....	<i>Geothlypis formosa</i> .....	BM, MAH, MF, SC
Mourning warbler .....	<i>Geothlypis philadelphia</i> .....	BM, MAH, MF, SC
Common yellowthroat.....	<i>Geothlypis trichas</i> .....	BM, MAH, SAM
Worm-eating warbler .....	<i>Helmitheros vermivorum</i> .....	BM, MAH, MF, SC
Yellow-breasted chat .....	<i>Icteria virens</i> .....	BM, MAH, MF, SC
Swainson's warbler .....	<i>Limnithlypis swainsonii</i> .....	BM, MAH, MF, SC
Black-and-white warbler .....	<i>Mniotilta varia</i> .....	MTC
Orange-crowned warbler.....	<i>Oreothlypis celata</i> .....	BM, MAH, MF, SC
Tennessee warbler .....	<i>Oreothlypis peregrina</i> .....	BM, MAH, MF, SC
Nashville warbler .....	<i>Oreothlypis ruficapilla</i> .....	BM, MAH, MF, SC
Louisiana waterthrush .....	<i>Parkesia motacilla</i> .....	BM, MAH, MF, SC
Northern waterthrush .....	<i>Parkesia noveboracensis</i> .....	BM, MAH, MF, SC
Prothonotary warbler.....	<i>Protonotaria citrea</i> .....	BM, MAH, MF, SC
Ovenbird.....	<i>Seiurus aurocapilla</i> .....	BM, MAH, MF, SC
Northern parula .....	<i>Setophaga americana</i> .....	BM, MAH, MF, SC
Bay breasted warbler.....	<i>Setophaga castanea</i> .....	BM, MAH, MF, SC
Black-throated blue warbler .....	<i>Setophaga caerulea</i> .....	BM, MAH, MF, SC
Cerulean warbler.....	<i>Setophaga cerulea</i> .....	BM, MAH, MF, SC
Hooded warbler .....	<i>Setophaga citrina</i> .....	BM, MAH, MF, SC
Yellow-rumped warbler .....	<i>Setophaga coronata coronata</i> .....	MTC
Prairie warbler .....	<i>Setophaga discolor</i> .....	MTC
Yellow-throated warbler .....	<i>Setophaga dominica</i> .....	BM, MAH, MF, SC
Blackburnian warbler .....	<i>Setophaga fusca</i> .....	BM, MAH, MF, SC
Magnolia warbler.....	<i>Setophaga magnolia</i> .....	BM, MAH, MF, SC
Palm warbler .....	<i>Setophaga palmarum</i> .....	MTC
Yellow warbler .....	<i>Setophaga petechia</i> .....	MTC
Chestnut-sided warbler.....	<i>Setophaga pensylvanica</i> .....	BM, MAH, MF, SC
Pine warbler .....	<i>Setophaga pinus</i> .....	MTC
American redstart .....	<i>Setophaga ruticilla</i> .....	BM, MAH, MF, SC

\*Non-native Species

**St. Andrews State Park Animals**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
Blackpoll warbler.....	<i>Setophaga striata</i> .....	BM, MAH, MF, SC
Cape May warbler .....	<i>Setophaga tigrina</i> .....	BM, MAH, MF, SC
Black-throated green warbler ..	<i>Setophaga virens</i> .....	BM, MAH, MF, SC
Blue-winged warbler.....	<i>Vermivora cyanoptera</i> .....	BM, MAH, MF, SC
Golden-winged warbler .....	<i>Vermivora chrysoptera</i> .....	BM, MAH, MF, SC
Seaside sparrow .....	<i>Ammodramus maritimus</i> .....	SAM, SC
Nelson's sharp-tailed sparrow...	<i>Ammodramus nelsoni</i> .....	SAM, SC
Lincoln's sparrow .....	<i>Melospiza lincolni</i> .....	BM, CG, RD
Savannah sparrow .....	<i>Passerculus sandwichensis</i> .....	MTC
Chipping sparrow .....	<i>Spizella passerina</i> .....	MTC
Field sparrow.....	<i>Spizella pusilla</i> .....	MTC
White-throated sparrow .....	<i>Zonotrichia albicollis</i> .....	MTC
Vesper sparrow.....	<i>Pooecetes gramineus</i> .....	MTC
Song sparrow .....	<i>Melospiza melodi</i> .....	MTC
Swamp sparrow.....	<i>Melospiza georgiana</i> .....	BM, CG, SAM, SC
White-crowned sparrow .....	<i>Zonotrichia leucophrys</i> .....	MTC
Northern cardinal .....	<i>Cardinalis cardinalis</i> .....	MTC
Blue grosbeak .....	<i>Passerina caerulea</i> .....	MAH, MF
Painted bunting .....	<i>Passerina ciris</i> .....	BM, MAH
Indigo bunting .....	<i>Passerina cyanea</i> .....	MTC
Rose-breasted grosbeak .....	<i>Pheucticus ludovicianus</i> .....	BM, DV, MAH
Scarlet tanager .....	<i>Piranga olivacea</i> .....	MTC
Summer tanager.....	<i>Piranga rubra</i> .....	MAH
Dickcissel.....	<i>Spiza americana</i> .....	MAH
Eastern towhee.....	<i>Pipilo erythrophthalmus</i> .....	MTC
Red-winged blackbird .....	<i>Agelaius phoeniceus</i> .....	MTC
Bobolink .....	<i>Dolichonyx oryzivorus</i> .....	BD, CG, CIS, DV
Rusty blackbird.....	<i>Euphagus carolinus</i> .....	MTC
Brewer's blackbird.....	<i>Euphagus cyanocephalus</i> .....	MTC
Baltimore oriole .....	<i>Icterus galbula</i> .....	DV, MAH, SC
Orchard oriole .....	<i>Icterus spurius</i> .....	DV, MAH, SC
Boat-tailed grackle .....	<i>Quiscalus major</i> .....	BD, CG, MAH, SC
Common grackle .....	<i>Quiscalus quiscula</i> .....	MTC
Eastern meadowlark.....	<i>Sturnella magna</i> .....	MTC
Yellow-headed blackbird .....	<i>Xanthocephalus xanthocephalus</i> .....	BM, CIS, SAM
Brown-headed cowbird .....	<i>Molothrus ater</i> .....	MTC
Pine siskin.....	<i>Carduelis pinus</i> .....	MF
American goldfinch.....	<i>Carduelis tristis</i> .....	MAH
House finch .....	<i>Haemorhous mexicanus</i> .....	MTC
Purple finch.....	<i>Haemorhous purpureus</i> .....	MTC
House sparrow.....	<i>Passer domesticus</i> * .....	DV

**MAMMALS**

Nine-banded armadillo.....	<i>Dasypus novemcinctus</i> * .....	MTC
Virginia opossum .....	<i>Didelphis virginiana</i> .....	MTC
Big brown bat.....	<i>Eptesicus fuscus</i> .....	MTC

\*Non-native Species

St. Andrews State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Eastern red bat.....	<i>Lasiurus borealis</i> .....	MTC
Hoary bat.....	<i>Lasiurus cinereus</i> .....	MTC
Northern yellow bat.....	<i>Lasiurus intermedius</i> .....	MTC
Seminole bat .....	<i>Lasiurus seminolus</i> .....	MTC
Southeastern myotis .....	<i>Myotis austroriparius</i> .....	MTC
Evening bat.....	<i>Nycticeius humeralis</i> .....	MTC
Tri-colored bat .....	<i>Perimyotis subflavus</i> .....	MTC
Brazilian free-tailed bat.....	<i>Tadarida brasiliensis</i> .....	MTC
Marsh rabbit .....	<i>Sylvilagus palustris</i> .....	MTC
Cotton mouse.....	<i>Peromyscus gossypinus</i> .....	BD, SC
Choctawhatchee beach mouse ..	<i>Peromyscus polionotus allophrys</i> .....	BD, SC
Norway rat (brown rat) .....	<i>Rattus norvegicus</i> * .....	DV
Black rat (roof rat) .....	<i>Rattus rattus</i> * .....	DV
Eastern gray squirrel .....	<i>Sciurus carolinensis</i> .....	MTC
Hispid cotton rat .....	<i>Sigmodon hispidus</i> .....	MTC
Coyote.....	<i>Canis latrans</i> * .....	MTC
Domestic cat .....	<i>Felis catus</i> * .....	MTC
Raccoon.....	<i>Procyon lotor</i> .....	MTC
Gray fox .....	<i>Urocyon cinereoargenteus</i> .....	MTC
Red fox.....	<i>Vulpes vulpes</i> * .....	MTC
Florida manatee.....	<i>Trichechus manatus</i> .....	AW
Bottle-nosed dolphin .....	<i>Tursiops truncatus</i> .....	AW
White-tailed deer .....	<i>Odocoileus virginianus</i> .....	MTC

\*Non-native Species



## Primary Habitat Codes

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### TERRESTRIAL

Beach Dune.....	BD
Coastal Berm.....	CB
Coastal Grassland .....	CG
Coastal Strand.....	CS
Dry Prairie .....	DP
Keys Cactus Barren .....	KCB
Limestone Outcrop .....	LO
Maritime Hammock .....	MAH
Mesic Flatwoods.....	MF
Mesic Hammock.....	MEH
Pine Rockland.....	PR
Rockland Hammock.....	RH
Sandhill .....	SH
Scrub .....	SC
Scrubby Flatwoods .....	SCF
Shell Mound .....	SHM
Sinkhole .....	SK
Slope Forest .....	SPF
Upland Glade.....	UG
Upland Hardwood Forest.....	UHF
Upland Mixed Woodland.....	UMW
Upland Pine.....	UP
Wet Flatwoods .....	WF
Xeric Hammock .....	XH

### PALUSTRINE

Alluvial Forest.....	AF
Basin Marsh .....	BM
Basin Swamp.....	BS
Baygall .....	BG
Bottomland Forest.....	BF
Coastal Interdunal Swale .....	CIS
Depression Marsh .....	DM
Dome Swamp.....	DS
Floodplain Marsh.....	FM
Floodplain Swamp.....	FS
Glades Marsh.....	GM
Hydric Hammock.....	HH
Keys Tidal Rock Barren .....	KTRB
Mangrove Swamp .....	MS
Marl Prairie.....	MP
Salt Marsh.....	SAM
Seepage Slope.....	SSL
Shrub Bog.....	SHB
Slough.....	SLO
Slough Marsh .....	SLM
Strand Swamp.....	STS
Wet Prairie .....	WP

## Primary Habitat Codes

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### LACUSTRINE

Clastic Upland Lake .....	CULK
Coastal Dune Lake .....	CDLK
Coastal Rockland Lake .....	CRLK
Flatwoods/Prairie .....	FPLK
Marsh Lake .....	MLK
River Floodplain Lake.....	RFLK
Sandhill Upland Lake .....	SULK
Sinkhole Lake.....	SKLK
Swamp Lake.....	SWLK

### RIVERINE

Alluvial Stream .....	AST
Blackwater Stream.....	BST
Seepage Stream .....	SST
Spring-run Stream .....	SRST

### SUBTERRANEAN

Aquatic Cave .....	ACV
Terrestrial Cave .....	TCV

### ESTUARINE

Algal Bed .....	EAB
Composite Substrate .....	ECPS
Consolidated Substrate.....	ECNS
Coral Reef .....	ECR
Mollusk Reef.....	EMR
Octocoral Bed.....	EOB
Seagrass Bed .....	ESGB
Sponge Bed.....	ESPB
Unconsolidated Substrate.....	EUS
Worm Reef.....	EWR

**MARINE**

Algal Bed .....MAB  
Composite Substrate .....MCPS  
Consolidated Substrate .....MCNS  
Coral Reef .....MCR  
Mollusk Reef .....MMR  
Octocoral Bed .....MOB  
Seagrass Bed .....MSGB  
Sponge Bed.....MSPB  
Unconsolidated Substrate.....MUS  
Worm Reef .....MWR

**ALTERED LANDCOVER TYPES**

Abandoned field ..... ABF  
Abandoned pasture ..... ABP  
Agriculture ..... AG  
Canal/ditch ..... CD  
Clearcut pine plantation ..... CPP  
Clearing ..... CL  
Developed ..... DV  
Impoundment/artificial pond ..... IAP  
Invasive exotic monoculture ..... IEM  
Pasture - improved ..... PI  
Pasture - semi-improved ..... PSI  
Pine plantation ..... PP  
Road ..... RD  
Spoil area ..... SA  
Successional hardwood forest ..... SHF  
Utility corridor ..... UC

**MISCELLANEOUS**

Many Types of Communities .....MTC  
Overflying ..... OF



## **Addendum 6—Imperiled Species Ranking Definitions**



## **Imperiled Species Ranking Definitions**

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The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

### **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 fabricated 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 or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of 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)

## **Imperiled Species Ranking Definitions**

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- 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 ..... due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G?..... Not yet ranked (temporary)
- 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 or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- S4..... apparently secure in Florida (may be rare in parts of range)
- S5..... demonstrably secure in Florida
- SH ..... of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX..... believed to be extinct throughout range
- SA..... accidental in Florida, i.e., not part of the established biota
- SE..... an exotic species established in Florida may be native elsewhere in North America
- SN ..... regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
- SU ..... due to lack of information, no rank or range can be assigned (e.g., SUT2).
- S?..... Not yet ranked (temporary)
- N ..... Not currently listed, nor currently being considered for listing, by state or federal agencies.

### **LEGAL STATUS**

#### **FEDERAL**

##### **(Listed by the U. S. Fish and Wildlife Service - USFWS)**

- LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE ..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.



## **Imperiled Species Ranking Definitions**

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- PT ..... Proposed for listing as Threatened Species.
- C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) ..... Endangered due to similarity of appearance.
- T(S/A) ..... Threatened due to similarity of appearance.
- EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
- EXPN, XN.... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

### **STATE**

#### **ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)**

- FE ..... Federally-designated Endangered
- FT ..... Federally-designated Threatened
- FXN..... Federally-designated Threatened Nonessential Experimental Population
- FT(S/A) ..... Federally-designated Threatened species due to similarity of appearance
- ST..... Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.
- SSC..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

## Imperiled Species Ranking Definitions

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### **PLANTS .... (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)**

LE ..... Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state 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, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.

LT ..... Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as 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 such number as to cause them to be endangered.

## **Addendum 7—Cultural Information**



## **Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)**

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**These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.**

### **A. General Discussion**

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, *'Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.'*

### **B. Agency Responsibilities**

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

### **C. Statutory Authority**

Statutory Authority and more in depth information can be found at:  
<http://www.flheritage.com/preservation/compliance/guidelines.cfm>

### **D. Management Implementation**

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

**Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)**

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Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

**E. Minimum Review Documentation Requirements**

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

[http://www.flheritage.com/preservation/compliance/docs/minimum\\_review\\_documentation\\_requirements.pdf](http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf) .

\* \* \*

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward  
Division of Historical Resources  
Bureau of Historic Preservation  
Compliance and Review Section  
R. A. Gray Building  
500 South Bronough Street  
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278

Fax: (850) 245-6435

## Eligibility Criteria for National Register of Historic Places

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The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

- 1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
  - a) are associated with events that have made a significant contribution to the broad patterns of our history; and/or
  - b) are associated with the lives of persons significant in our past; and/or
  - c) embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
  - d) have yielded, or may be likely to yield, information important in prehistory or history.
  
- 2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
  - a) a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
  - b) a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
  - c) a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
  - d) a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

## Eligibility Criteria for National Register of Historic Places

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- e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- f) a property achieving significance within the past 50 years, if it is of exceptional importance.



## Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

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**Restoration** is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

**Rehabilitation** is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

**Stabilization** is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

**Preservation** is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.



**Addendum 8 —Land Management Review**





**FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

MARJORY STONEMAN DOUGLAS BUILDING  
3900 COMMONWEALTH BOULEVARD  
TALLAHASSEE, FLORIDA 32399-3000

RICK SCOTT  
GOVERNOR

CARLOS LOPEZ-CANTERA  
LT. GOVERNOR

HERSCHEL T. VINYARD JR.  
SECRETARY

**MEMORANDUM**

**TO:** Keith Singleton, Land Acquisition and Management Planner  
Division of State Lands

**FROM:** Parks Small, Chief, Bureau of Natural and Cultural Resources *DOB for*  
Division of Recreation and Parks

Lew Scruggs, Chief, Office of Park Planning *LPS*  
Division of Recreation and Parks

**SUBJECT:** Response to Draft Land Management Review (LMR) St. Andrews State Park

**DATE:** November 14, 2014

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The Land Management Review draft report provided to DRP determined that management of St. Andrews State Park by the Division of Recreation and Parks met the two tests prescribed by law. Namely, the review team concluded that the land is being managed for the purposes for which it was acquired and in accordance with the land management plan.

Below are Additional Recommendations and Checklist Findings (items the LMR determined should be further addressed in the management plan update) of the draft LMR report, with our manager's response to each. The responses were prepared via a coordinated effort of the park, district office, and our offices.

**The team recommends that DRP and park staff explore additional opportunities to assess and fund the replacement of critical public use structures including docks, boardwalks, bathroom facilities, many of which have fallen into poor and/or unsafe condition. (6+, 0-)**  
*Managing Agency Response:* Agree. The division will consider these recommendations during the next unit management plan revision. The updated unit management plan will address infrastructure funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs.

**The team recommends that DRP and park staff continue their efforts to better map and define the coastal natural communities present at this park. (6+, 0-)**  
*Managing Agency Response:* Agree. Several natural communities were mapped erroneously in the previous draft, these will be corrected. The Natural communities at the park will be better mapped and defined in the updated unit management plan.

**The team recommends that DRP and park staff further assess currently defined carrying capacities to determine their effectiveness in protecting natural resources, as well as the quality of the visitor experience. (6+, 0-)**

*Managing Agency Response: Agree. The division will consider these concerns during the next unit management plan revision.*

**The team recommends that DRP and park staff assess the overall park interpretive message to determine if all trails and public access points are adequately interpreted as well as to determine the appropriateness of the existing turpentine still structure within the park's interpretive vision. (6+, 0-)**

*Managing Agency Response: Agree. Park management will assess current trails and associated interpretive messages to determine if and where improvements are needed. The park has already made strides through a partnership with the American Bird Conservancy to add shorebird interpretive panels at key access points on the beach. The park will continue these efforts where needed. The Division will assess the existing turpentine still and determine the appropriateness of the current location.*

**The team recommends that DRP and park staff continue to assess improvements and for relocation of campsites regularly threatened or closed due to high water events. (6+, 0-)**

*Managing Agency Response: The division will consider these recommendations during the next unit management plan revision. Additionally, measures to reduce flooding of the campgrounds will be explored during the next planning cycle, including consideration of living shorelines.*

**The team recommends that DRP and park staff deploy more monofilament disposal stations on piers or near docks. (6+, 0-)**

*Managing Agency Response: Agree. The division will consider these recommendations during the next unit management plan revision and will work with FWC to place monofilament disposal stations in strategic locations near popular fishing locations near the pier, near docks and beach access points.*

**The team recommends that DRP and park staff investigate the possibility of adding a shorebird/seabird display in the interpretive building. (6+, 0-)**

*Managing Agency Response: Agree. The division will consider these recommendations during the next unit management plan revision and work with the Friends of St. Andrews to work towards adding a shorebird/seabird display to the existing displays present in the interpretive building. If funding becomes available, we will work with FWC, Audubon of Florida and other partner agencies to develop appropriate language for the display.*

**The team recommends that DRP and park staff continue to investigate efforts to best place dredged spoil to build up beaches with respect to placement to high water line. (6+, 0-)**

**Managing Agency Response:** Agree. Park management is already consultation with the Corp of Engineers, FWC and other partner agencies to discuss the location and techniques for placement of dredge spoil from the St. Andrews Channel. Future efforts will strive to minimize impacts to nesting shorebirds and seabirds by aiming for fall and winter dredge activities. In addition, sand placed along the gulf beach will be placed in the near shore to allow natural wave action to deposit sand on the beach, therefore minimizing loss of food base for coastal wildlife at the high water line.

#### FIELD REVIEW

**Cultural Resources (Archeological & Historic sites), specifically cultural resource survey and protection and preservation, received below average scores. The review team is asked to evaluate, based on information provided by the managing agency, whether cultural resources are sufficient.**

**Managing Agency Response:** Agree. The updated unit management plan will address cultural resource needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs.

**Restoration, specifically dune restoration/building removal, received a below average score. The review team is asked to evaluate, based on their perspective, whether restoration efforts are adequate.**

**Managing Agency Response:** Agree. The dune restoration/revegetation associated with the movement of the Pier Store is already in the planning process with approved funds through the Florida Legislature. The updated plan will continue to address the dune restoration following movement of the building.

**Forest Management, specifically timber inventory, received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether forest management is sufficient.**

**Managing Agency Response:** Agree. During the development of an updated plan, an analysis will be made regarding the feasibility of timber management activities in the park.

**Hydrologic/Geologic function Hydro-Alteration, specifically stormwater management and dune erosion at inlet, received below average scores. The review team is asked to evaluate, based on information provided by the managing agency, whether past and present hydrologic and geologic functions are sufficient.**

**Managing Agency Response:** Agree. The management plan update will address hydrologic needs at the park and will identify where funding is needed. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs. Moreover, the dune erosion at the inlet (see below above

under Gator Lake shoreline stabilization) is currently being addressed and the project is underway.

**Resource Protection, specifically signage, received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether resources are sufficient to protect the property.**

*Managing Agency Response: Agree. The updated unit management plan will address signage needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs.*

**Environmental Education & Outreach, management of visitor impacts, received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether environmental education & outreach are sufficient.**

*Managing Agency Response: Agree. The Division will address adding additional education and outreach opportunities and interpretive facilities and signs with the update of the management plan. Already the park works closely with Audubon of Florida as part of a beach steward program aimed at outreach and minimizing visitor impacts to nesting shorebirds. The park will continue to work with FWC and Bay county Law Enforcement to increase protection and management of park visitors. The park already has several education and outreach programs, but will consider adding additional programs opportunities during the next planning cycle.*

**Management Resources, specifically sanitary facilities, buildings, staff and funding, received below average scores. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.**

*Managing Agency Response: Agree. The updated unit management plan will address infrastructure funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs.*

#### PLAN REVIEW

**Natural Communities, specifically beach dune, maritime hammock, scrub, basin marsh/interdunal swale, depression marsh, coastal dune lake, salt marsh and marine unconsolidated substrate, received below average scores. This is an indication that the management plan does not sufficiently address current or desired condition and/or future management actions to protect or restore.**

*Managing Agency Response: Natural communities including maritime hammock, scrub, basin marsh/interdunal swale, depression marsh, coastal dune lake, salt marsh and marine unconsolidated substrate will be more thoroughly addressed in the next plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next*



update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Listed species: Protection & Preservation, specifically animals, gopher tortoise and plants, received below average scores. This is an indication that the management plan does not sufficiently address protection and preservation of species.**

*Managing Agency Response: The protection and preservation of listed species, particularly animals, gopher tortoise and plants, will be more thoroughly addressed in the next plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

**Natural Resources Survey and Monitoring Resources, specifically other non-game species or their habitat monitoring, fire effects monitoring, other habitat management effects monitoring and invasive species survey/monitoring, received below average scores. This is an indication that the management plan does not sufficiently address survey or monitoring.**

*Managing Agency Response: Natural Resources Survey and Monitoring Resources including other non-game species or their habitat monitoring, fire effects monitoring, other habitat management effects monitoring and invasive species survey/monitoring will be more thoroughly addressed in the next plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

**Cultural Resources, specifically cultural res. survey and protection and preservation, received below average scores. This is an indication that the management plan does not sufficiently address survey or protection.**

*Managing Agency Response: Cultural resource survey and protection and preservation will be more thoroughly addressed in the next plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

**Resource Management, Prescribed Fire, specifically quality, received a below average score. This is an indication that the management plan does not sufficiently address current or desired condition and/or future management actions to protect or restore.**

*Managing Agency Response: Prescribed fire quality will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC*

when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Restoration, specifically dune restoration/revegetation and Gator Lake shoreline stabilization, received below average scores. This is an indication that the management plan does not sufficiently address restoration.**

*Managing Agency Response:* Restoration including dune restoration/revegetation and Gator Lake shoreline stabilization will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Forest Management, specifically timber inventory, received a below average score. This is an indication that the management plan does not sufficiently address timber inventory.**

*Managing Agency Response:* Timber management will be addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Non-Native, Invasive & Problem Species, specifically prevention of pests/pathogens and control of plants and pests/pathogens, received below average scores. This is an indication that the management plan does not sufficiently address of invasive species.**

*Managing Agency Response:* Non-native, invasive and Problem Species including prevention of pests/pathogens and control of plants and pests/pathogens will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Hydrologic/Geologic function, Hydro-Alteration, specifically roads/culverts, stormwater management and dune erosion at Inlet, received below average scores. This is an indication that the management plan does not sufficiently hydrologic and geologic function.**

*Managing Agency Response:* Hydrologic/Geologic function, Hydro-Alteration including roads/culverts, stormwater management and dune erosion at Inlet will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.

**Resource Protection, specifically boundary survey, gates & fencing, signage and law enforcement presence, received below average scores. This is an indication that the management plan does not sufficiently resource protection.**

*Managing Agency Response: Resource Protection including boundary survey, gates & fencing, signage and law enforcement presence will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

**Adjacent Property Concerns, specifically discussion of potential surplus land determination, received a below average score. This is an indication that the management plan does not sufficiently address surplus lands.**

*Managing Agency Response: Adjacent Property Concerns including discussion of potential surplus land determination will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

**Environmental Education & Outreach, specifically interpretive facilities and signs, received a below average score. This is an indication that the management plan does not sufficiently address facilities and signs.**

*Managing Agency Response: Environmental Education and Outreach including interpretive facilities and signs will be more thoroughly addressed in the next management plan update. The current management plan was reviewed by the relevant agencies and was in full compliance with Chapters 253 and 259, F.S. and Chapter 18-2 FAC when it was approved by ARC. The next update of this plan will be in full compliance with changes made to the statutes noted above by the Florida Legislature in 2008.*

Thank you for your attention.

/gk

CC: Danny Jones, Chief, Bureau of Parks District 1  
Tony Tindell, Assistant Chief, Bureau of Parks District 1  
Brian Addison, Park Manager, St. Andrews State Park  
Raya Pruner, Environmental Specialist, Bureau of Parks District 1

