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1.0 EXECUTIVE SUMMARY

This Conservation Plan creates a framework for protecting and managing the natural resources of Jekyll Island. It will be integrated into the Master Plan to assure its influence on land use on the Island over the long-term. The Plan is expected to be clarified, refined, and adapted based on further research, improved techniques, and a changing environment. The Plan defines long-term objectives, desired goals and impediments to success, and management actions.

The Jekyll Island Authority (JIA) established a Conservation Planning Committee and tasked them with the responsibility of developing a Conservation Plan for the long-term conservation of natural resources on Jekyll Island. Through several revisions, the committee created an outline of the conservation strategy in December of 2009. This strategy included a mission to:

Preserve, maintain, manage, and restore Jekyll Island's natural communities and species diversity while providing nature-based educational and recreational opportunities for the general public.

AECOM led the effort to produce this Plan and served as Committee and public meeting facilitators, as well as authors of draft and final documents. The Plan received extensive edits from the Conservation Planning Committee and the public. Two drafts of the Plan received comments from more than 400 interested parties, many of whom participated in one or more public meetings. The work was conducted in close collaboration with the Conservation Planning Committee chair, Dr. Terry Norton, with extensive input from other JIA staff including C. Jones Hooks, the Executive Director.

Consistent with the enabling legislation associated with the acquisition of the Island by the State, this Plan does not attempt to modify or change the boundaries depicting the 35% / 65% separation of development and conservation. These boundaries will be reviewed as part of the upcoming Jekyll Island Master Plan update. Instead, the Plan identifies conservation measures on both developed and undeveloped lands throughout the Island.

The Georgia Department of Natural Resources (GADNR) conducted extensive work on Jekyll Island from 2007 – 2010, and these data were used to develop base maps for the Plan. In addition to these studies, the Plan includes documentation of data compiled on natural resources in Georgia through written text, appendices, and references to websites where data for resources such as sea turtle nests, bird banding stations and NatureServe research is regularly updated.

The Plan includes an overview of the predominant vegetation communities and land uses found on the Island. Predominant communities include Maritime Hammocks, Pine Forests, Tidal Marshes, Beaches and Urban/Developed Areas. The Plan identifies Threats, Key Attributes and Desired Future Conditions for natural communities as a way of defining priorities for management. The Management section of the Plan defines comprehensive management actions, and divides the Island into distinct Units for implementing actions in the short- and long-term. Finally, there is a section entitled Environmental Assessment Procedure (EAP) that defines a process for evaluating natural resource impacts associated with proposed development projects and defines Special Protection Areas that warrant particular attention.

Desired Future Conditions for each vegetation community and land use were defined to provide a vision for the ecological structure, diversity, physical condition, and aesthetic over an extended timeframe (50 years). Many of the Desired Future Conditions share common elements that can provide broader guidance on management practices for overall natural resources including:

- Mature canopy conditions
- Appropriate shrub/herbaceous layer diversity
- Stable wildlife populations
- Wetlands and coastal creeks exhibiting natural and dynamic hydroperiods
- Multiple seral stages in dune/swale barrier island development
- Plant diversity based on salinity, tidal fluctuation, storm events, and dune/beach dynamics

General management elements were identified to accomplish these objectives, including: a fire management program, minimization of habitat fragmentation, exotic species management, hydrological enhancement, and protection of priority wildlife species. Likewise, specific management actions were developed for each of the six Management Units defined for the Island. These six units are comprised of the following:

1. Beach and Interdunal Swale – Beach, primary dune, and early successional back dune/swale systems;
2. Dry Hammock – Naturally vegetated forested systems in the southern third of the Island;
3. Coastal Marsh – Salt marshes, coastal creeks, and small forested islands;
4. Upland Forest – Pine and oak forests of the northern third of the Island along with pockets of forested freshwater wetlands;
5. Golf Courses – The four golf courses, forested systems within the golf courses, and the adjacent forested, freshwater wetlands;
6. Urban/Parks – Residential, commercial, Historical District, and park land uses along with altered natural systems.
Many of the components of this Plan cite specific needs for monitoring. A number of ongoing monitoring programs already provide useful data for managing natural resources on the Island. With consideration of these ongoing efforts, a general plan for monitoring was developed to assure progress toward management objectives. A more detailed approach was recommended to match staffing (including volunteers) and funding levels for implementing the Plan.

The 2009 Conservation Strategy emphasizes the importance of Environmental Education (EE) on the Island, and opportunities for coordinating and expanding EE were discussed at Conservation Planning Committee and public meetings. Through these discussions, it became apparent that coordination of educational programs on the Island needed special focus. To integrate the overall nature-based experience for visitors to Jekyll Island, representatives from several public and private groups that currently provide EE experiences and environmental education for a diverse general public.

**EE Mission:** Provide high quality, nature-based interpretive experiences and environmental education for a diverse general public.

**EE Vision:** Inspire visitors to value the conservation of natural resources on barrier islands and beyond.

**EE Goal:** Ensure that the public is aware of, and provided with the opportunity to engage in coastal environmental learning opportunities and conservation efforts.

The Plan includes a new format for reviewing proposed development projects on the Island. The format is called the Environmental Assessment Procedure (EAP). Each proposed project must demonstrate that it does not compromise the ability to preserve, maintain, manage, and restore Jekyll Island’s natural communities and species diversity. The EAP will function in coordination with the Master Plan and Design Guidelines.

The EAP is intended to determine whether there are any expected environmental impacts to landscape-level variables that would result in the recommendation for a modification or rejection of the proposed project due to inconsistencies with objectives for conservation on the Island. For projects that have none of these “fatal flaws,” a local/site scale evaluation will identify and recommend specific design elements required for approval of the proposed project.

Several natural communities were identified as priority because they are globally rare, unique to barrier islands, or provide habitat for sensitive wildlife. Priority communities include:

- Southern Hairgrass - Saltmeadow Cordgrass - Dune Fingergrass Herbaceous Vegetation
- Southern Atlantic Coastal Plain Carolina Willow Dune Swale
- Southeastern Florida Maritime Hammock
- South Atlantic Coastal Shell Midden Woodland
- Outer Coastal Plain Sweetbay Swamp Forest
- Loblolly-bay Forest
- Red Maple - Tupelo Maritime Swamp Forest
- Sawgrass Head
- South Atlantic Coastal Pond
- Live Oak - Yaupon - (Wax-myrtle) Shrubland Alliance
- Atlantic Coast Interdune Swale
- Sea-oats Temperate Herbaceous Alliance

The objectives of the Plan are ambitious and will require a sustained effort with dedicated staff. Current staff of the JIA can continue to implement some of the management actions identified in this Plan; however the Plan calls for additional work and staffing beyond what is currently employed by JIA. The most significant of these hires is the Director of Conservation. Existing staff, graduate students, interns, and volunteers will have substantial roles in the implementation of the Conservation Plan.

The Conservation Plan needs an associated budget with additional funds from a dependable (permanently-funded) source. Some of the initial actions in the Plan can be implemented by re-allocating existing staff or by focusing the efforts of existing partners. Other funding options have also been discussed including the establishment of a Conservation Fund through the Jekyll Island Foundation, contributions from groups that use the Convention Center and additional fees for entering the Island that would be dedicated to protection and management of natural resources. Leveraging ongoing relationships with natural resource partners would also add to the effectiveness of the Plan.

The Conservation Plan was improved by the extensive review of JIA staff, the Conservation Planning Committee and the two representatives of the public that participated in Committee meetings and the preparation of draft reports. Hundreds of individuals commented on the initial drafts and this input led to substantial changes in the Plan. During three public meetings, hundreds of residents and Jekyll Island supporters listened to updates on the status of the Plan, engaged in lively discussions that led to substantial changes in the approach, and provided extensive commentary that were considered by the Conservation Planning Committee. The expectation from the JIA Board, the Conservation Planning Committee, JIA staff, and the public is that this thoroughly vetted Conservation Plan will provide a sustained vision for natural resource protection on Jekyll Island.
CONTEXT FOR THE ENTIRETY OF THE JEKYLL ISLAND CONSERVATION PLAN:

Georgia law specifically designates Jekyll Island as a State Park, meaning that the land and its flora and fauna belong to all citizens of Georgia. Thus conservation of the Island’s natural assets is important all across the State. Jekyll Island, however, belongs to a special category of State Parks, since it is not managed by the Georgia Department of Natural Resources State Park Division and is therefore not subsidized by the State’s taxpayers. Rather, the Jekyll Island - State Park Authority is authorized as the Island’s governing body and required to operate the Park as a financially self-sufficient entity. Residential neighborhoods within the Island park are made up of leased lots, and the lease fees flow to the Jekyll Island – State Park Authority. Parking fees are collected at the Island’s entrance. Vacation and convention-oriented businesses lease land and pay portions of their revenues to the Jekyll Island - State Park Authority. These leases and other fees are used to support the operation and conservation of the Island. The Jekyll Island Conservation Plan recognizes the need for income-yielding, developed portions of the Island respecting the statutory limit of 35% of the Island’s uplands as determined in the Jekyll Island Master Plan, and provides direction for less-restrictive protection of wildlife in these zones, in addition to providing for strong protection of the strictly natural areas of the Island (65% of the Island’s uplands).
2.0 INTRODUCTION

The intent of this Plan is to create a framework for protecting and managing the natural resources of Jekyll Island, part of the Georgia State Park system managed by the Jekyll Island – State Park Authority (JIA). It is not the final story for conservation; instead, it provides a vision for a long-term (50+ year) approach to protect, adaptively manage, and enhance the sensitive environments of this barrier island within a continually changing physical, social, and biological context. A 50+ year planning horizon provides context for the vision for the Island within a dynamic environment, including sea-level changes and multiple “generations” of land managers on the Island. This Plan is not intended to serve as an annual work plan, specific funding vehicle, or new ordinance for the Island, although any or all of these may be needed to fully implement the conservation strategy outlined in the Plan. This Plan will be integrated into the Master Plan for the Island and will be utilized extensively during the planning process to inform and guide updates to the Master Plan. The Plan is expected to be clarified, refined, and adapted based on further research, improved techniques, and a changing environment to maintain and improve conservation efforts and natural resource values of the Island. The Plan defines long-term objectives, a description of desired goals and impediments to success, and management actions to meet the objectives that will help focus various natural resource agencies, JIA staff and volunteers on a unified strategy for conservation on the Island.

2.1 MISSION AND PRIORITIES

The JIA established a Conservation Planning Committee and tasked them with the responsibility of developing a Plan for the long-term conservation of natural resources on Jekyll Island. Through several revisions, the committee created an outline of the conservation strategy in December of 2009. This Conservation Strategy included the following mission:

Preserve, maintain, manage, and restore Jekyll Island’s natural communities and species diversity while providing nature-based educational and recreational opportunities for the general public.

The Committee identified four primary areas of focus. These were:

1. preservation of biological communities and species diversity,
2. restoration, maintenance, and management of the Island’s ecological processes,
3. nature-based tourism and recreation, and
4. environmental education.

Goals identified by the Committee included stewardship of natural resources, the provision of high-quality nature-based recreational experiences, and the development of a funding strategy for achieving conservation goals. The strategy recognizes the importance of partners in implementing conservation objectives, as well as the assessment of public access, and other activities that could impact natural habitats. The Committee determined that data compiled under the framework of the NatureServe Ecological System should be used as a baseline for implementing plans for resource protection.
The scope of work for the creation of this conservation plan includes:

- compilation of existing data,
- use of NatureServe landcover maps prepared by the Georgia Department of Natural Resources as base maps,
- site analyses to evaluate natural systems and their existing conditions,
- review of the Plan through the Conservation Planning Committee,
- review of the Plan through public workshops, and
- presentation of the Plan to the JIA Board.

The scope for this Plan did not include a specific assessment of existing facilities, user perspectives or recreation needs on the Island. This type of study could be conducted to supplement existing information on resource-based recreation and to set more detailed objectives for the future at the discretion of the JIA Board. It is anticipated that a visitor’s capacity survey and carrying capacity study that draws upon and expands information available for future updates to this Plan will be conducted as part of the Master Plan update process anticipated to begin in Fiscal Year 2012. Still, a review of existing trails as they relate to natural resource management was conducted, as these trails contribute to active management of the property through access and firebreaks. As such, these data helped inform the management plan. The type and extent of recreational improvements to the Island will continue to be addressed in the Master Plan.

AECOM conducted this work in close communication with the Jekyll Island Conservation Planning Committee chair, Dr. Terry Norton, and in close collaboration with other JIA staff that served on the Conservation Planning Committee. The Conservation Planning Committee itself was an active participant in the organization of this report, and the production of the Plan. The Committee met five times from April 2010 through February 2011, and provided valuable insight on coastal Georgia resource issues for which they had broad and deep experience and expertise.

2.2 LAND AREA COVERED BY PLAN

Established in 1950, the JIA was chartered and granted a lease from the State of Georgia for all of Jekyll Island as well as the marshes and marsh islands adjacent and adjoining the Island (O.C.G.A. § 12-3-241). Beginning in 1971 and as amended over time, the Georgia General Assembly established that the JIA is “empowered to survey, subdivide, improve, and lease or sell to the extent and in the manner provided in this part, as subdivided and improved, not more than 35 percent of the land area of Jekyll Island which lies above water at mean high tide” (O.C.G.A. § 12-3-243(a)(1)) and is restricted from doing similar activities in the remaining 65% of the Island. In 2007, the Georgia General Assembly reiterated in House Bill 214 (HB 214 – attached as Appendix A) that the State was committed to maintaining “not less than 65 percent of the land area of Jekyll Island which lies above water at mean high tide” as undeveloped and the beaches would remain free and open for the people of the State. HB 214 also included provisions to include portions of the southern end of the Island, except uses specifically grandfathered into the provision, within the 65 percent protection area of the Island.

In compliance with provisions in the Georgia code concerning master planning efforts for the Island and establishment of the delineation of the 35/65 boundary, the JIA prepared a Master Plan in 1996 to “‘delineate, based upon aerial survey, the present and permitted future uses of the land area of Jekyll Island which lies above water at mean high tide’” (O.C.G.A. § 12-3-243.1). The Master Plan also delineated “…the boundaries of the area or areas delineated on the master plan as the 65 percent of the land area of Jekyll Island which lies above water at mean high tide…” that the authority would leave undeveloped. The Master Plan identified the elevation basis and areal extent of the lands above water at mean high tide using an aerial survey upon which the percentages were calculated.

Consistent with the legislation that requires the Master Plan to define the boundaries of the 65 percent undeveloped lands, this Plan does not attempt to modify or change those boundaries. These boundaries will be reviewed as part of the Jekyll Island Master Plan update that will be initiated in 2012.
However, this Plan does identify and characterize conservation measures on developed and undeveloped lands throughout the Island, and marshes adjacent to the Island. These efforts will be used to inform and implement the Master Plan. To that end, the acreage represented on the vegetation maps and other calculations within the Plan encompass an area larger than the lands lying above water at mean high tide. The Master Plan will continue to exclude lands lying below water at mean high tide from the baseline used to calculate the 35/65 percentages. For this document, the expectation is that the entire Island is covered by a comprehensive approach to conservation of natural resources, and that the objectives to “preserve, maintain, manage, and restore Jekyll Island’s natural communities and species diversity” are paramount. This includes a review of the effects of future development on natural resources, conservation strategies on the golf courses, and in particular, a framework for managing natural communities.

2.3 DATA COMPILATION AND COMPONENTS OF THE CONSERVATION PLAN

Previous documents, books and historical publications have well documented the natural and cultural history of Jekyll Island. Because of the extent of existing data on natural systems in the region, and on Jekyll Island in particular, this investigation did not involve extensive fieldwork to compile information on natural communities, land use, or the dominant plants and animals found in coastal Georgia. The JIA also authorized an initial study on the natural resources and management options of the Island that was codified into a series of reports that is collectively entitled as the 2006 Jekyll Island Conservation Plan. This series of reports contains an extensive list of plants and animals that were observed, or have the potential to occur on the Island, although some public reviewers have noted that the lists include inaccuracies, omissions, repetitions, and unnecessary material. Although some of the information provided in these reports requires updating as management and monitoring efforts progress on the Island, the report is included in the Appendices to document historical steps taken in the development of this Plan. The relevant documents from this “interim conservation plan” are shown in Appendices B - E. The Georgia Department of Natural Resources (GADNR) conducted extensive work on Jekyll Island from 2007 – 2010, which was used to develop base maps for this Plan.

House Bill 214 (Full text in Appendix A):
BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.
The Georgia General Assembly finds that Jekyll Island is home to some of the state’s most treasured natural and cultural resources and it is the expressed intent of this body to ensure the preservation of these resources for the enjoyment of all Georgians now and for future generations to come. For this reason, the state shall continue its commitment that not less than 65 percent of the land area of Jekyll Island which lies above water at mean high tide shall remain undeveloped. Jekyll Island proudly displays one of Georgia’s largest stretches of barrier island property. It is the expressed intent of this body that the beach areas of Jekyll Island will remain free and open for the use of the people of the state. Commercial improvement is intended to better existing and future development of the remaining 35 percent of Jekyll Island while retaining public access to the beaches for the pleasure of all of Georgia’s citizens. The General Assembly further finds that the deteriorating conditions of public and commercial facilities is of great interest to the legislature and to the public and that by significantly extending the existing lease authority for the Island’s property, the state will thereby help to secure and encourage future investments and provide a basis for long-term revitalization of the Island. Jekyll Island is recognized by this body as “Georgia’s Jewel,” and its remarkable beauties are hereby preserved so that they may continue to shine for all citizens of Georgia.

Jekyll Island's coastal waters are important to the economy of south Georgia
This Plan does not repeat this wealth of information, but instead provides a brief summary of relevant natural resource data and a description of the environmental setting of the Island in order to set the background for the Management Plan. It includes documentation of data compiled on natural resources in Georgia through written text, appendices, and references to websites where data for resources such as sea turtle nests, bird banding stations and NatureServe research is regularly updated. The Plan uses vegetative communities as the framework for management actions, and identifies Threats, Key Attributes and Desired Future Conditions for natural communities as a way of defining priorities for management.

The Management section of the report defines comprehensive management actions, and divides the Island into distinct Units for implementing actions in the short- and long-term. Many of the proposed actions can be implemented as soon as staff and funding are available to be dedicated to the task. Others require the formation of a committee to collect more data, discuss options, and then decide on a course. These include the development of a comprehensive beach management plan, and a plan for managing nuisance and invasive wildlife populations.

Finally, there is a section entitled Environmental Assessment Procedure that defines a process for evaluating natural resource impacts associated with proposed development projects and defines Special Protection Areas that warrant particular attention. This process will be included in the project review that is currently conducted by the JIA for proposed developments with the Master Plan and design guidelines and protocol for compliance with stormwater, beachfront lighting and pet restrictions.

The expectation is that there should be a formal review and update of this Plan at least every five years, preferably by re-convening a Conservation Planning Committee. For future updates, the Conservation Planning Committee will be comprised of individuals with expertise in ecology, conservation biology, and barrier island ecosystems, environmental education, and environmental law along with key JIA staff. Updates to the Conservation Plan will involve citizen involvement through a public review process.

2.4 PUBLIC INVOLVEMENT

Jekyll Island’s natural resources are treasured by local residents, frequent guests, business owners, and environmentalists concerned about the protection of unique resources in coastal Georgia. Two representatives of the public, Dr. Steve Newell and Mr. Al Tate, served as reviewers of this report. The public was invited to share their perspective about conservation on the Island in public meetings held in October and December 2010. A draft of this Plan was produced and posted for public review on January 4, 2011. More than 300 individuals and groups provided comments on the January 4, 2011 draft, which have been posted on the JIA website and included as Appendix F-1. A revised version of this Plan was produced and posted for public review on March 7, 2011 and reviewed at a public meeting on March 25, 2011. More than 250 individuals and groups provided comments on the March 7, 2011 draft, which have been posted on the JIA website and included as Appendix F-2. The JIA Board provided oversight to the production of this document, and was updated on its status in September 2010 and January 2011. The final Plan was presented to the JIA Board at a public board meeting on July 18, 2011.
3.1 CLIMATE AND SOILS

Jekyll Island is located in Glynn County, one of the coastal counties in the State of Georgia. The county is hot and humid in the summer but the barrier island is frequently cooled by sea breezes. Winters are cool, with occasional brief cold spells. Rainfall averages slightly less than 50 inches a year, with a disproportionately heavy distribution between June and September; snowfall is rare. Data on historical temperatures and rainfall from the nearby Brunswick field station can be found online.

The USDA Natural Resources Conservation Service soil survey for Glynn County Georgia identifies nine general soil map units, which are grouped according to slope and landscape. Those that occur on Jekyll Island include the Meggett, Mandarin-Rutledge, Cainhoy-Mandarin-Pottsburg, Pelham-Sapel, Fripp-Duckston-Beaches, and Bohicket-Capers families of soils. Specific mapping units that occur on Jekyll Island are shown on Figure 1.

3.2 HYDROLOGY

The cycle of water in and around the Island has significant ramifications for the distribution, extent, and health of natural systems on the Island. The elevation, duration, energy, and frequency of the tide defines the structure and vegetation diversity for beach/dune systems and salt marshes and significantly influences the vegetation successional gradient landward of the mean high tide line. Non-tidal wetlands are dependent on freshwater sources, comprised primarily of rainfall and surficial groundwater, as well as the attenuation of salinity levels provided by positive drainage of freshwater. These wetlands provide significant habitats and freshwater sources for common and priority plant and wildlife species found on the Island. Other waterbodies created for fill production, stormwater attenuation and treatment, or other purposes also provide freshwater sources, but exhibit different vegetation structure than freshwater wetlands.

Brunswick Field Station Temperature and Precipitation Data: [http://www.sercc.com/crn](http://www.sercc.com/crn); select GA Brunswick 23 S station

Georgia Encyclopedia - Lower Coastal Plain and Coastal Islands Description: [http://www.georgiaencyclopedia.org](http://www.georgiaencyclopedia.org); search term: Lower Coastal Plain

Georgia Department of Natural Resources, Coastal Resources Division: [http://crd.dnr.state.ga.us/](http://crd.dnr.state.ga.us/); search for “Links to Websites of the Georgia Coastal Barrier Islands”

Vegetative communities transition over time on historic dunes
FIGURE 1
SOILS

Legend

- **Plan Area 5,847.2 acres**
- **SOILS**
  - BO - Bohicket-Capers Association
  - Be - Beaches
  - CaB - Carnhoy Fine Sand, 0-5% slopes
  - FdD - Fripp-Duckson Complex, 0-20% slopes
  - Ma - Mandarin Fine Sand
  - Mb - Mandarin-Urban Land Complex
  - Me - Meggett Fine Sandy Loam
  - Pe - Pelham Loamy Sand
  - Po - Pottsburg Sand
  - Ru - Rutledge Fine Sand
  - W - Water
FIGURE 2
REGIONAL CONTEXT

Legend

--- Plan Area
Alterations to surface and groundwater flows and volumes can have significant ramifications for natural systems. Impervious surfaces that route rainfall and stormwater directly into brackish or saline environments can alter the salinity levels and corresponding vegetation communities at point discharges, while also limiting the capacity for groundwater recharge of the surficial aquifer. Water withdrawals from the surficial or deeper aquifers can result in reductions in the elevation of groundwater on a temporary or permanent basis. The lowering of the groundwater can result in saltwater intrusion into the surficial aquifer and the advent of detrimental salinity levels into historically freshwater systems. Lowered groundwater levels can also reduce the duration and elevation of inundation within freshwater systems through more rapid “leakage” of water from wetlands or lakes into the surficial aquifer. If extended over a long duration of time, the reduction in groundwater hydrology may result in the loss or significant degradation in wetland function.

Evidence of reduced hydrological function is apparent on the Island, including lower pond levels, transitional and upland vegetation beginning to grow within historical wetland systems, and loss of canopy species through death and extensive fallen timber, although the factors causing these changes are not well understood. Regional influences, such as groundwater withdrawals for industrial uses on the mainland and potable water supplies, may be lowering groundwater levels on the Island. Although smaller in scale on an individual basis, surficial water wells used to irrigate lawns and other landscapes may have local scale impacts on surficial aquifer levels. Historical infrastructure and development uses may also be affecting surface water routing, thereby influencing groundwater recharge as well as surface water inputs into wetland systems. Additional studies would be beneficial to improve the understanding of the causes of the apparent reduced hydrological functions.

Water saving conservation measures have begun to be implemented on the Island, ranging from capture and use of rainwater for flushing toilets (i.e., Hampton Inn) to cisterns that capture rainwater for irrigation and other uses (i.e., new Convention Center). Methods of reducing water use by golf course operations will be explored and implemented, where feasible. Further evaluations on the amounts of water use needed for human consumption will be conducted after the carrying capacity study is completed in association with the Master Plan update.

3.3 REGIONAL CONTEXT

The Georgia Humanities Council in partnership with the University of Georgia has created the Land and Resources section of the new Georgia Encyclopedia. This online resource provides a primer on the history, geology, and ecology of Jekyll Island, including a description of the ecology of Georgia’s Lower Coastal Plain. The website provides a comprehensive description of the ecology of various natural systems from the beach and dunes systems, across salt marshes and freshwater sloughs to maritime forests. Schoettle provides a series of maps depicting tidal currents, rivers and inlets, and barrier island profiles reflecting...
the time frame in which Jekyll Island and other Georgia coastal islands were created. Approximately half of Jekyll Island was created 35,000 to 40,000 years ago during the Pleistocene Epoch, particularly the core of the Island. The northern and southern portions of the Island were created in the Holocene Epoch, and these portions of the Island have "younger" vegetation associations. Tidal flow, patterns of waves and currents, and dynamic winds continue to affect soil deposition and vegetation associations on the Island. In general, the northeastern portion of the Island is affected by erosive currents, and the southern portion of the Island is exposed to accretion and the formation of new dunes.

### 3.5 HISTORICAL LAND USES

Jekyll Island’s earliest known inhabitants were Native American hunter-gatherers who lived on the Island in small groups during the Late Archaic Period, approximately 4,500 years ago. Current boundaries of the Historic District, Horton House and Brewery Ruins Site, Former Huddle House Site, and Great Dunes Golf Course, comprise four of the largest prehistoric settlement areas on the Island. The Native American habitation influenced the existing landscape because they disposed of large quantities of oyster, whelk, and clam shells in the form of midden piles throughout the Island in numerous locations. As a result of this activity over several centuries, the soil pH was altered, producing very basic soils and their associated plant communities. In addition, Native Americans would regularly burn off the underbrush of the Island to improve hunting and minimize attacks from biting insects. Over time, this practice of frequent controlled burns most likely affected plant and animal species diversity on the Island.

English occupation reached Jekyll Island in 1738-1739 with General Oglethorpe stationing Captain William Horton on the Island. This led to the construction of a home and brewery on the north end of the Island as well as the planting of rye, barley, other grains, and an orange grove. In 1792, the Island was purchased by Christophe Poulain du Bignon who raised sea-island cotton as a prosperous enterprise until the Civil War. A large swath of the Island was cleared from the present Historic District running north to the Horton House Historic Site and utilized for growing cotton. About 1830-1840, the largest live oaks on the Island were sold to the United States Navy Department for ship timber with most of them going to the Pensacola Naval Yard for ship construction. Cabbage palms were also a rare site on the Island prior to the formation of the Jekyll Island Club as they had been cut for their cabbage, which was highly esteemed in the South as table delicacy. In 1884, John Eugene du Bignon began raising Devon cattle stock, mostly in the same areas that were formerly used to raise cotton. In the following twenty years, most of the Island was not actively managed. After the Civil War, feral horses, cattle and hogs multiplied rapidly and their depredations most likely had a significant impact on the Island’s landscape. Not until the Island came into the possession of the Club were efforts taken to mitigate these conditions.

In 1886, the Island was purchased by the Jekyll Island Club and Club members selected a landscape architect (Horace William Shaler Cleveland) to develop a landscape plan for the Club Grounds in 1887 that accepted the natural beauty of the Island. As a result, most of the Island was primarily managed in its natural state during most of the Club Era, also in part to support hunting. Hunting the abundance of game on the Island was perhaps the activity most highly regarded by early Club members and landscape management efforts were directed towards optimizing this activity, including the use of prescribed burning. As the popularity of hunting waned in favor of other activities, the prescribed burnings became less frequent. As the Club began to have financial troubles, Club members in 1939 decided to raise money by cutting some of their timber, followed by the cutting and sale of sellable pine timber on the entire Island, excluding the Club compound, in 1941 and 1942. The harvesting of pine timber clearly would have resulted in significant disturbance to large portions of the Island. It appears that most of the timber that was harvested on the Island occurred primarily on the older, Pleistocene portions of the Island.

The State of Georgia acquired the Island from the Club in 1947 and built a causeway to connect the Island to the mainland. During the early State era, the Island underwent significant development. With the creation of Beachview Drive, large sections of the natural dunes once described as almost 40 feet high in places, were leveled flat from Captain Wylly Drive to south of the Days Inn to create a concrete boardwalk and to provide uninterrupted views of the ocean from Beachview Drive. The creation of South Riverview Drive and other roadways on the Island restricted the original tidal flows into interior salt marsh as natural stream beds were directed into culverts. The airport site was also greatly expanded, resulting in the filling of several acres of salt marsh to expand the size of the runway. Some of this fill material might have eroded into the adjacent salt marsh, creating additional high marsh along the north east boundary of the taxiway. The construction of golf courses significantly altered the Island’s natural fresh water plant
Beach and dune systems are vulnerable to erosion and sea level rise – these Johnson rocks were used to stabilize beaches in the northern portion of the Island communities. Oleander golf course altered the original hydrology of both salt and fresh water systems, but the bulk of these alterations were created during the Club era.

Perhaps the greatest landscape impact to the Island occurred in ca. 1968 when the JIA attempted to create a marina complex on the southwest end of the Island. Several acres of salt marsh were dredged in an attempt to create both a fresh water and salt water yacht basin. The spoils were used to construct earthen dikes around each basin, plus an upland area for parking and support activities. The salt water basin was connected directly to Jekyll Creek, while the fresh water basin did not initially connect to adjacent tidal waters. Unfortunately, soon after dredging the salt water yacht basin, it started to silt back in. In time, the salt water yacht basin was converted into a low level salt marsh by pumping additional dredge material from Jekyll Creek back into the salt water yacht basin. The fresh water yacht basin had connecting culvert pipes installed through its dikes to increase its tidal exchange. A portion of the high grounds comprise Summer Waves Water Park and parking for the boat ramp complex. Overall, the entire natural hydrology system and its surrounding plant communities were drastically altered by this project. The disturbed areas also provided a suitable environment for several invasive exotic species to become established on the Island.

Former dredging operations approved by the Army Corps of Engineers in Jekyll Creek and St. Simons Island Sound over the previous decades have also altered the ecology of the adjacent salt marshes and natural sand sharing processes. Dredge material was periodically pumped directly into the adjacent salt marsh, creating additional hammocks and high marsh flats in several locations. Some of these newly created hammocks actually allowed for the establishment of very rare plants, but these disturbed sites also allowed additional invasive exotic species to become more established on the Island. Reduction in the dynamics of sand movement due to dredging operations has also affected erosion on the Island. Jekyll Island experienced steady erosion on the north end of the Island between 1860 to 1974, with a maximum loss of 850 feet. On the northwest river slope, up to 580 feet of erosion occurred over this same time period. The Island is also gradually migrating southward by erosion on the north end and accretion on the south end. For example, the houses of St. Andrews subdivision were at one time beach front homes, only a few hundred feet from the ocean. They now sit over 1/2 a mile from the ocean on their eastern boundary and the new land that has accreted provides habitat for Wilson’s and Piping plovers.

Hurricanes have had direct and indirect impacts on the Island. Hurricane Dora in 1964 eroded significant portions of the Island’s dunes. This erosion was significant enough that a revetment was installed shortly thereafter. Approximately 4.8 miles of revetment were constructed on the Island between 1965 and 1976, the majority of which was constructed of granite boulders that sit on top of a base of compacted crushed granite. The granite rocks, also known as Johnson Rocks after President Johnson, are still in place from roughly in front of the former Buccaneer Hotel site to 1/4 mile north of Villas By the Sea. In several locations, the dunes simply reestablished themselves and completely obscured the Johnson Rocks, but in other Island locations, the Johnson Rocks are fully exposed and have completely compromised the habitat for nesting sea turtles. Rock armoring reflects wave energy rather than absorbing or dissipating it. As a result these structures can actually increase the natural rate of beach erosion in the immediate vicinity of the protective structures or along adjacent downdrift shorelines.

Wildfires have also affected the Island, but their infrequency and limited size has minimized their impact to established plant communities. Their historical impact was also most likely minimal due to the small size of the Island and its separation from the main land. The most significant change in the past decade has been the dramatic and rapid loss of most of the Island’s red bays due to the introduction of laurel wilt disease. The first diagnosis for the Island was in the summer of 2006, but within two years, almost half of the Island’s red bays had succumbed to the disease, and nearly all of the Island’s red bays were lost by 2010. The long term impact will be difficult to determine, but the significant loss of a primary understory plant does create the potential for invasive exotic species to fill the gap that was left behind.

Since 1950, Jekyll Island has operated under the direction of the JIA with a Board comprised of members appointed by the Governor. The JIA was created to oversee conservation and development of the Island. In association with the JIA are the nonprofit Jekyll Island Foundation, the Georgia Sea Turtle Center, which is a department of the JIA, and the environmental education-focused 4-H Tidelands Nature Center.
3.6 CULTURAL RESOURCES

In addition to the well-known Historic District facilities, the Island includes a number of archaeological and cultural resource sites. A total of 53 archaeological sites were known to occur in 2011 on property managed by the JIA. Fifty of these archaeological sites are currently listed with the Georgia Archaeological Site File (GASF), including 21 prehistoric sites, 14 historic sites, 8 sites with both historic and prehistoric components, and 7 sites of unknown cultural affiliation. Two additional sites are known and have site forms, but have not received a State Site Number. They are both listed as prehistoric sites. One additional historic site is known, but does not appear to have a completed Site Form or State Site Number.

Jekyll Island’s recorded prehistoric sites date from the Late Archaic through the Mississippian periods. Sites occupied by Native Americans during the Contact Period have not been clearly identified. Known historic period sites range from Horton House, completed in 1743, to sites affiliated with the Jekyll Island Club period on the Island.

A number of buildings and structures on the Island have survived and are not commonly accessed or in accessible areas, including:

- **Spanish American Gun Emplacement/Artillery Mounts** - Installed circa 1898, along what was then beachfront. Located southeast of the St. Andrews picnic area.

- **Confederate Battery** - Constructed by the Confederate Army in late 1861 and early 1862. Abandoned in 1862 and dismantled by the Union Army in 1862. Located west of the Jekyll Island Airport.

- **Skeet House** - Constructed circa 1910 by the Jekyll Island Club as part of Skeet and Trap Sport Shooting area. Located east of the Jekyll Island Airport.

- **Dairy Silo/Barn Site** - Constructed by the Jekyll Island Club circa 1910. All that remains is a tabby silo.

Archaeological investigations on the Island prior to the middle 1980s are summarized in a 1985 survey report prepared by Morgan R. Crook, Jr. (West Georgia College). Informal studies (i.e., roadside examination of exposed artifacts, brief visits to documented sites) were conducted in the 1950s. In the early 1970s, the University of Florida sponsored test excavations at the Horton House and nearby Horton Brewery site. The University of Georgia and the JIA sponsored additional informal (nonsystematic) archaeological surveys of the Island during the early to middle 1970s. These studies resulted in initial documentation of many of the currently recorded archaeological sites. In 1974, shell and artifacts were exposed during construction work on the fourteenth fairway on the Indian Mound Golf Course, although no report was produced. A researcher from West Georgia College conducted investigations on the Island in 1985 and recorded 16 additional archaeological sites. The same researcher conducted additional archaeological testing at the Horton House site in 1991. Ten archaeological sites were recorded in surveys conducted in 1994 for the proposed Great Dunes Golf Course, while surveys in 2001 and 2002 each recorded two previously unknown archaeological sites. Work continues annually to identify and survey sites as funding becomes available or as project planning necessitates. These efforts are managed by the Director of Historic Resources for the Jekyll Island Authority and staff.

3.7 ECOLOGICAL THREATS AND STRESSES

Specific ecological Threats and Stresses have been identified and used in this Plan to define existing and potential pressures on natural resources on the Island. They are characterized for each Vegetative Community cited in Section 4.0, and they serve as key elements of Management Actions in Section 5.0. Several of these specific ecological threats and stresses affect multiple vegetation communities and may affect the fulfillment of management objectives for the entire Island. These threats are similar to those identified by the US Fish and Wildlife Service in the Draft Comprehensive Conservation Plan and Environmental Assessment for the Savannah Coastal Refuge Complex for six National Wildlife Refuges in coastal portions of Georgia and South Carolina (see http://www.fws.gov/savannah/ccp.html until the plan is finalized) issued in September 2010. The identification and use of threats and stresses to guide the development of management actions is also consistent with the Nature Conservancy’s Conservation Action Planning approach. The following summarizes general categories of ecological threats, stressors, and stresses occurring across the Island:

- **Development and Redevelopment**: Development and redevelopment activities can cause the direct loss of habitat, wildlife, and plant species through grading, filling, or other land alterations. They may also cause alterations in indirect conditions of natural habitats such as through changes in light production, sound pollution, and stormwater quality, quantity, and timing of release. Even redevelopment constructed within an existing building footprint can cause impacts to surrounding habitats during and following construction. Development and redevelopment activities pose one of the more significant stresses and threats to natural habitats on the Island.
b. Habitat Loss or Fragmentation: Existing infrastructure occurs on the margins or already bisects portions of the Island. In some cases, conversion of natural communities to urban uses causes a direct loss of habitat. Incompatible uses that fragment natural communities or erode the ecological continuity between natural vegetation types also serve to facilitate exotic species invasion and destructive fires.

c. Stand-altering fire: Unplanned fires (from cigarettes and campfires, improper fire prescription, lightning fires, etc.) in areas with high fuel loads have a high chance of creating intense fires that exceed the fire resilience capacity of characteristic canopy species within many of the natural communities on the Island. A stand-altering fire could remove fire-sensitive, canopy trees (e.g., live oaks) and/or shift successional processes towards a different community type.

d. Exotic, invasive species and native nuisance species: Both faunal and floral exotic invasive species have the potential to affect biodiversity, structure, and population dynamics. Floral species such as Chinaberry, salt cedar and Chinese tallow have the capacity to alter stand structure, fire susceptibility, and overall biological diversity. Faunal species such as feral cats and fire ants prey on native species. The Ambrosia beetle and its associated fungus is continuing to affect the distribution and health of red bay trees, while the cactus moth is detrimentally affecting populations of prickly pear cactus across the Island. Although not currently known on the Island, feral hogs and armadillos occur in the region where they can destroy native plants, sea turtle nests, and ground-nesting birds. While desirable from a wildlife viewing perspective, native wildlife can at times adversely affect long-term conservation goals by preferentially foraging on propagules and saplings of desirable native plant species (e.g., white-tailed deer) or feeding directly on another target priority species (e.g., raccoons foraging on sea turtle eggs).

e. Groundwater alterations: Regional changes in groundwater have affected freshwater wetlands on the Island. In addition to affecting the hydrology of freshwater wetlands, these groundwater changes affect salinity at locations where the groundwater historically discharged through freshwater systems into tidal marshes.

f. Tidal flow alterations: Tidal flow alterations can occur from a variety of activities such as dredging efforts that alter sand shoals to structural impoundments of historical salt marshes to constrictions on tidal flow such as culverts. These alterations can have direct effects on salinity levels and inundation regimes for salt marsh and beach areas. They can also indirectly affect freshwater flow and retention in freshwater wetland systems upstream of tidal creeks and wetlands.

g. Beach erosion and sand starvation: Beach erosion and sand starvation affect both the beach ecosystem and dunes and interdunal swales that provide habitat for shorebirds and sea turtles.

h. Sea-level change: The US Fish and Wildlife Service Draft Comprehensive Conservation Plan projects a sea-level change along the Georgia coast of approximately 25 inches by 2100. This sea-level change would likely affect inundation regimes, salinity levels, and structural aspects of vegetation zonation for tidal marshes, beaches, dunes, interdunal swales, and other habitats on the Island.

i. Limited regeneration of canopy species: The limited number of canopy species saplings in several habitats provides a diminished base for canopy recruitment in the event of a natural event (e.g., storm damage, lightning) or human-induced event (e.g., wildfire, canopy removal). Factors affecting sapling number and diversity may include over-browsing by deer, lack of appropriate conditions for germination (e.g., thick duff layers, lack of fire or sunlight, etc.), and historical management practices.

Some invasive exotic species of plants are still being used in landscapes on Jekyll Island
4.1 INTRODUCTION

Extensive vegetation community and land cover mapping has been conducted as part of previous management planning efforts for the Island and work conducted by the Georgia Department of Natural Resources (GADNR). The GADNR mapping efforts characterized vegetation types using U.S. National Vegetation Classification designations and associations documented by NatureServe. A total of 29 vegetation communities and land covers were identified as part of the 2011 update for these mapping efforts, which are shown on Figure 3 and referenced in Section 4.2 below. A survey of rare plant species was conducted on the Island in the fall of 2007 by Greg Krakow of Georgia DNR. The results of this survey are included in Appendix G.

Likewise, there is an extensive history of wildlife surveys on the Island, and much of this work is ongoing. The Georgia Sea Turtle Center collects data on nesting sea turtles as well as the results of their rehabilitation efforts on sea turtles and other wildlife. Jekyll Island has a bird banding station that has been banding birds for more than a decade, and winter shorebird counts document the occurrence of the federally-listed piping plover and dozens of other species. The GADNR has led efforts to survey rare species of plants and animals, and continues to monitor the status of the wood stork colony on the Island. These and other ongoing monitoring efforts are referenced in Section 5. This study was not intended to generate new data on wildlife occurrences, but to provide a resource for historic and ongoing studies. These studies are cited in Section 4.4 below, as well as in other sections of the Plan.
FIGURE 3
VEGETATIVE COMMUNITIES

Legend

Plan Area 5,847.2 acres

Land Cover
(Source: Georgia Department of Natural Resources)

1 Maritime Live Oak Hammock 1,080.24
2 Southeastern Florida Maritime Hammock 80.12
3 Red-cedar - Live Oak - Cabbage Palmetto Marsh Hammock 32.42
4 South Atlantic Coastal Shell Midden Woodland  6.15
5 Maritime Slash Pine - Longleaf Pine Upland Flatwoods  673.79
6 Mid- to Late-Successional Loblolly Pine - Sweetgum Forest  4.68
7 Outer Coastal Plain Sweetbay Swamp Forest  24.87
8 Loblolly-bay Forest  20.76
9 Red Maple - Tupelo Maritime Swamp Forest  26.52
10 Southern Atlantic Coastal Plain Carolina Willow Dune Swale  6.09
11 Atlantic Coast Interdune Swale  69.99
12 Live Oak - Yaupon - (Wax-myrtle) Shrubland Alliance  57.55
13 Coastal Salt Shrub Thicket  56.89
14 Blackberry - Greenbriar Successional Shrubland Thicket  13.14
15 Sea-oats Temperate Herbaceous Alliance  66.37
16 Sand Cordgrass - Seashore Mallow Herbaceous Vegetation 11.32
17 Southern Hairgrass - Saltmeadow Cordgrass - Dune Fingergrass Herbaceous Vegetation  2.14
18 South Atlantic Coastal Pond  8.08
19 Successional Broom-sedge Vegetation  1.90
20 Sawgrass Head  1.56
21 Southern Atlantic Coastal Plain Salt and Brackish Tidal Marsh  1,754.52
22 South Atlantic Upper Ocean Beach  294.92
23 Pond/Open water  2.85
24 Developed  603.87
25 Golf Course  478.06
26 Parks and Recreation  32.27
27 Quarry/Stripmine/Excavated Water Body  97.97
28 Transportation  337.59
29 Open Field  0.54
1. These data and maps are intended for use by private land managers, public agencies, nongovernmental organizations and others involved in land use decision-making and land conservation planning efforts. This map is not to be used to identify jurisdictional boundaries of wetlands or other habitats for regulatory purposes or to define critical habitat for listed species.

2. Due to the limited number of coastal Georgia examples in the National Vegetation Classification System (NVCS), the assignment of natural community names is subject to change as more regional information is gathered.

3. An accuracy assessment of this product for the entire county indicated an overall accuracy level of 89% at the time of publication. However, all of the mapped communities on Jekyll Island were visited on the ground, ensuring a much higher accuracy in photo interpretation. Please keep in mind that natural community boundaries change over time.
A list of plant and animal species referenced in the Plan, including both common and scientific names are included in Appendix H. A detailed list of plant and wildlife species observed, or with potential for occurrence on the Island during the production of the interim conservation plan is included as Appendix D.

### 4.2 VEGETATIVE COMMUNITIES

#### 4.2.1 Vegetative Communities

The descriptions that follow provide a brief overview of the predominant vegetation communities and land uses found on the Island. Vegetation communities with similar structure and/or ecological characteristics, such as forested wetlands and herbaceous wetlands, have been grouped within these overviews. Several vegetation communities with smaller areal extent or ruderal characteristics were not included in this overview, but all the communities are described in information provided by GADNR in Appendix I. Each of the following overviews includes:

- **General Vegetation Category**, including US Vegetation Classification designation(s) and corresponding number on Figure 3;
- A brief **Description** of the current structure of each habitat;
- **Key Ecological Attributes** that consist of ecological or biological characteristics on which the habitat composition, structure, or aesthetic depends. Alteration of these characteristics could lead to the loss of the habitat type over time;
- **Underlying Soil** types based on the mapping efforts included in the USDA Soil Survey of Camden and Glynn Counties, Georgia, 1980;
- **Acreage and Percentage** that each vegetation community/land cover occurs on within the Island;
- **Dominant Vegetation** (by stratum if appropriate);
- **Other Common Plant Species** found within the vegetation type;
- A description of the **Current Conditions** of the structure, diversity, hydrology, fuel loads, or other characteristics relevant to defining management goals;
- **Global Rarity Ranking** based on the global ranks identified in the Conservation Status section of the vegetation classification description maintained by NatureServe;
- **Threats and Stresses** to the integrity, function, and/or aesthetic of each land use/vegetation community listed in order of priority to be addressed;
- **Wetland Status** based on Environmental Setting designations within the associated NatureServe vegetation classification;
- **Desired Future Conditions** for the community that would be obtained with appropriate management over a 50-year period.

Trails traverse through upland forest communities

Beach communities are highly affected by constantly moving sands
4.2.1.1 MARITIME HAMMOCKS MARITIME LIVE OAK HAMMOCK (1), SOUTHEASTERN FLORIDA MARITIME HAMMOCK (2)

**Description**
Mature upland forests of mixed, old-age canopy dominated by live oak, sand live oak, and other oak species, minimal (Live Oak Hammock) to moderately dense (Florida Maritime Hammock) mid-story, and diverse understories ranging from dense saw palmetto to open shrub layers with minimal herbaceous plants.

**Key Ecological Attributes**
Mature forest canopy composition and structure; Broad areas with intact habitat; Canopy species that are sensitive to fire

**Underlying Soils**
Cainhoy fine sand, 0-5% slopes; Fripp-Duckston complex, 0-20% slopes; Mandarin fine sand; Meggett fine sandy loam; Pelham loamy sand

**Acreage/Percent of the Island**
1,160 acres (19.8%)

**Dominant Vegetation**
- **Dominant Canopy/Subcanopy Vegetation**: live oak, sand live oak (Florida Maritime Hammock), sand laurel oak, slash pine, red bay, cabbage palm
- **Dominant Shrub Vegetation**: saw palmetto, beautyberry, sparkleberry, eastern red cedar, wax myrtle, yaupon holly, crookedwood (Florida Maritime Hammock), fetterbush (Florida Maritime Hammock)
- **Dominant Herbaceous Vegetation**: witchgrass, slender woodoats, foxtail, basketgrass, whip nutrush
- **Other Common Vegetation**: blackberry, catbrier, American holly, Spanish moss, witchgrass, switchcane, resurrection fern, eastern gamagrass, muscadine, tough bully, pigeonwings

**Current Conditions**
Variable canopy characteristics and understory conditions range from mature canopies of pine and sand laurel oak, with frequently high fuel loads from leaf litter and saw palmetto, to mixed canopies of live oak and pine over an open shrub and groundcover layer to multi-aged stands of large live oak over a dense understory comprised almost exclusively of saw palmetto and crookedwood. Areas with saw palmetto exhibit other fire dependent/resilient herbaceous and shrub species. For most canopy areas, the canopy is primarily mature with few multi-aged saplings/young trees present, although the number of saplings is more pronounced in the southern portion of the Island within this habitat.

**Threats and Stresses**
- Habitat fragmentation and loss from new development uses or modifications to existing uses
- High fuel loads and extensive fuel “laddering” on or adjacent to fire sensitive canopy species that could expose the community to destructive, stand-altering fires
- Undesirable fire applications due to factors such as campfires, discarded cigarettes, and improper fire prescription
- Invasive floral and faunal exotic species infestations (e.g., feral cats, fire ants)
- Loss of red bay trees from laurel wilt
- Limited regeneration of canopy species due to factors such as deer over-browsing and lack of appropriate recruitment conditions (e.g., open soils, fire)

**Wetland Status** – No

**Global Rarity Ranking**
- G1 Critically Imperiled
- G2 Imperiled
- G3 Vulnerable
- G4 Apparently Secure
- G5 Secure

*Note: Both Maritime Live Oak Hammock and Southeastern Florida Maritime Hammock*

**Desired Future Conditions**
Intact aggregations of mature canopy supplemented by multi-aged saplings with a diversity and structure of native species, including epiphytes, and minimal fuel loads comprised of duff, herbaceous, and low-growing shrub vegetation that reduce the potential for destructive, uncontrolled fires
4.2.1.2 PINE FORESTS MARITIME SLASH PINE UPLAND FLATWOODS (5), MID- TO LATE-SUCCESSIONAL LOBLOLLY PINE – SWEETGUM FOREST (6)

Description
Mature upland forests of pine-dominated, typically old-age, canopy with minimal midstory and diverse understories

Key Ecological Attributes
Mature pine canopies with scattered oaks; Diverse understory of fire dependent/resilient species; Habitat continuity with other vegetation types

Underlying Soils
Mandarin fine sand; Mandarin-Urban Land Complex; Pelham loamy sand; Rutledge fine sand

Acreage/Percent of the Island
679 acres

679 acres

11.6%

Dominant Vegetation
• Dominant Canopy/Subcanopy Vegetation: slash pine, live oak, red/swamp bay, loblolly pine, sweetgum
• Dominant Shrub Vegetation: saw palmetto, wax myrtle, eastern red cedar, yaupon holly, fetterbush
• Dominant Herbaceous Vegetation: rockrose, silkgrass, brackenfern, Virginia chainfern, stinging nettle, dune prickly-pear
• Other Common Vegetation: catbrier, Spanish moss, witchgrass, switchcane, prickly-pear, pigeonwings, deerberry, sea oxeye, elephant’s foot, beautyberry, St. Andrews cross, coral bean, camphor tree, blackberry

Current Conditions
Pine dominates the canopy throughout with scattered occurrences of live oak and other canopy species. Understory conditions range from dense saw palmetto (less common) and yaupon holly to more open shrub-dominated areas with herbaceous species present. Portions have recently been burned, reducing fuel loads, but much of this type exhibits high fuel loads from leaf litter and saw palmetto. The majority of the canopy south of Shell Road is primarily mature with little multi-aged saplings/young trees present. Canopy north of Shell Road and scattered areas within other areas exhibit multi-aged stands of pine

Threats and Stresses
• Habitat fragmentation and loss from new development uses or modifications to existing uses
• High fuel loads that could expose the community to destructive, stand altering fires
• Limited ability to apply prescribed fire due to restrictions such as smoke management and fire control measures posed by adjacent land uses
• Limited regeneration of canopy species due to factors such as lack of appropriate recruitment and seed production conditions (e.g., open soils, fire) and deer over-browsing
• Undesirable fire applications due to factors such as campfires, discarded cigarettes, and improper fire prescription
• Invasive floral and faunal exotic species infestations (e.g., feral cats, fire ants)

Wetland Status – No

Global Rarity Ranking

G1 Critically Imperiled
G2 Imperiled
G3 Vulnerable
G4 Apparently Secure
G5 Secure

Desired Future Conditions
A multi-age canopy comprised of pine, live oak, and other native canopy species with a relatively open, diverse herbaceous and shrub layer characterized by low fuel loads that support occasional, low intensity fires
**Desired Future Conditions**

Mature-canopy of native wetland species, with natural (dynamic) hydroperiods that support a diversity of multi-aged canopy species and appropriate understory and herbaceous vegetation.
4.2.1.4 BACK-DUNE/DUNE SWALE VEGETATION ATLANTIC COAST INTERDUNE SWALE (11); LIVE OAK – YAUPON HOLLY – (WAX-MYRTLE) SHRUBLAND ALLIANCE (12)

**Description**
Mosaic of dune successional vegetation stages from backdune swales to shrub thickets

**Key Ecological Attributes**
Salt tolerance; Hydrological inundation regime; High species and habitat diversity

**Underlying Soils**
Beaches

**Acreage/Percent of the Island**
128 acres 2.2%

**Dominant Vegetation**
- **Dominant Canopy/Subcanopy Vegetation:** scattered live oak and cabbage palm
- **Dominant Shrub Vegetation:** wax myrtle, swamp/red bay, eastern red cedar
- **Dominant Herbaceous Vegetation:** needle rush, saltmeadow cordgrass, bluestem, rush
- **Other Common Vegetation:** peppervine, tough bully, groundsel, Hercule’s club, plume grass, saw palmetto, lantana, pigeonwings, butterfly pea, giant foxtail, knotweed, rustweed, dune prickly-pear, prickly-pear, ragweed

**Current Conditions**
Undulating landscape exhibits mosaic of shrub/oak thickets on dry areas and freshwater herbaceous marshes in depressions; system exhibits high diversity in herbaceous and shrub species on an overall basis, although upland areas can be low in vegetation cover; wetland depressions range from diverse freshwater systems to brackish needle rush flats, in part due to successional status and distance from the primary dune (measured from the south)

**Threats and Stresses**
- Soil openings within community or adjacent vegetation types may lead to wind erosion
- Sensitive to overwash if adjacent dunes are altered
- Habitat fragmentation and loss from new development uses or modifications to existing uses
- Sea-level rise from climate change may alter vegetation composition and soils in recently-established interdune swales
- Exotic species infestations
- Development in adjacent lands may limit seed sources for succession
- Sensitive to alterations in the timing, salinity and duration of water discharges from adjacent development
- Early successional areas may be sensitive to recreation uses
- Deer over-browsing may limit recruitment of shrub and canopy species
- Motorized off-road vehicles may alter soil characteristics and disturb soils leading to wind erosion

**Wetland Status** – Yes (Atlantic Coast Interdune Swale); No (Live Oak-Yaupon holly (Wax-myrtle) Shrubland Alliance)

**Global Rarity Ranking**
- G1 Critically Imperiled
- G2 Imperiled
- G3 Vulnerable
- G4 Apparently Secure
- G5 Secure

*Note: G3 (Atlantic Coast Interdune Swale); G2/G3 (Live Oak-Yaupon holly (Wax-myrtle) Shrubland Alliance)*

**Desired Future Conditions**
A variety of seral stages ranging from herbaceous interdune swales to mature live oak forests with salt-tolerant shrubs that are allowed to undergo natural successional processes
4.2.1.5 SALTMARSH ISLANDS/ECOTONES RED-CEDAR – LIVE OAK – CABBAGE PALMETTO MARSH HAMMOCK (3); SOUTH ATLANTIC COASTAL SHELL MIDDEN WOODLAND (4); COASTAL SALT SHRUB THICKET (13)

**Description**
Isolated patches of live oak and cedar forest and/or shrubland with scattered palms and pines with dense, salt-tolerant understory vegetation on small islands or peninsulas surrounded by tidal marsh, some underlain by high-calcium soils enriched with oyster shell material.

**Key Ecological Attributes**
Salt tolerance and sensitivity to salinity changes; Shrub-dominated structure influenced by tidal hydrology; Calcium-loving vegetation (Shell Midden); Ecotone transition from marsh to upland forests.

**Underlying Soils**
Mandarin fine sand; Bohickets-Capers Association (including disposed dredged material).

**Acreage/Percent of the Island**
96 acres

**Dominant Vegetation**
- **Dominant Canopy/Subcanopy Vegetation**: live oak, southern red cedar, cabbage palm, slash pine (*Shrub Thicket*), black cherry (*Shrub Thicket*), Hercules-club (*Shell Midden*), sugarberry (*Shell Midden*).
- **Dominant Shrub Vegetation**: Marsh Hammock - saw palmetto; *Shell Midden* - Florida wild privet, small-flowered buckthorn, soapberry, saw palmetto, yaupon holly, erect prickly-pear, Spanish bayonet; *Shrub Thicket* - wax myrtle, red cedar, groundsel, marsh elder, yaupon holly, salt cedar, lantana.
- **Dominant Herbaceous Vegetation**: Marsh Hammock/Shrub Thicket - dune prickly-pear, sea oxeye, salt grass; *Shell Midden* - rouge plant, sandmat, mistflower.
- **Other Common Vegetation**: coral bean, needle rush, trumpet vine, poison ivy, tough bully, muscadine, Virginia creeper, red/ swamp bay, Spanish moss.

**Current Conditions**
Occur on salt marsh ecotones as well as sand ridges and islands, including a shell midden and dredge spoil island, surrounded by salt marshes in southern portion of Island; successional communities representing transition from high-elevation areas in marsh communities to live oak hammocks as land and soil accretes around the vegetation; calcium-loving species occur as co-dominants in the canopy and/or shrub layers of the Shell Midden, including several Georgia Special Concern plant species; salt cedar (exotic) present in many locations; trees at lower elevation margins exhibiting decreased vigor, potentially due to hydrologic or salinity changes.

**Threats and Stresses**
- Invasion and expansion of area occupied by salt-tolerant exotic species
- Native cactus species experiencing rapid declines from non-native cactus moth
- Succession to closed canopy mixed pine and oak forest
- Limited regeneration of canopy species due to factors such as lack of appropriate recruitment, seed production conditions (e.g., open soils, fire) and deer over-browsing
- Wave erosion of dredge spoil island
- Hydrological alterations in the adjacent marshes and rivers
- Sea-level change impacts to community through inundation
- Undesirable fire applications due to factors such as campfires and improper fire prescription
- Motorized off-road vehicles may alter soil characteristics and disturb soils leading to wind erosion.

**Wetland Status** – Yes (Shrub Thicket); No (Marsh Hammock, Shell Midden).

**Global Rarity Ranking**
- G1 Critically Imperiled
- G2 Imperiled
- G3 Vulnerable
- G4 Apparently Secure
- G5 Secure

**Note:**
G3 (Red Cedar – Live Oak – Cabbage Palmetto Marsh Hammock); G2 (South Atlantic Coastal Shell Midden Woodland); G4 (Coastal Shrub Thicket).

**Desired Future Conditions**
Multi-age canopy of native oak, cedar, and shrubs (*Marsh Hammock*), calcium-loving and other shrub species (*Shell Midden*), or a mixture of native pine and oak and salt-tolerant shrubs (*Salt Shrub*) that grade into the adjacent coastal marsh.
**Description**
Primary dune dominated by sea-oats

**Key Ecological Attributes**
Salt tolerance; Dune formation; Vegetation composition and structure of species that contribute to dune formation/stabilization

**Underlying Soils**
Beaches

**Acreage/Percent of the Island**
66 acres

**Dominant Vegetation**
- **Dominant Herbaceous Vegetation:** sea oats
- **Other Common Vegetation:** bitter seabeach grass, southern saltwort, fleabane, butterfly pea, pigeonwings, dune primrose, largeleaf pennywort, sandspur, beach elder, saltmeadow cordgrass, railroad vine, beach croton, fiddleleaf morning-glory, yucca, seashore dropseed

**Current Conditions**
Extensive natural primary dune in southern portions of Island; sea oats restoration occurring in central portion of Island; variable degrees of disturbance occur throughout Island from pedestrian traffic

**Threats and Stresses**
- Highly sensitive to human encroachment
- Soil destabilization
- Vegetation loss
- Availability of sea oats propagules plants for regeneration
- Wave erosion
- Vegetation re-establishment within restoration areas
- Exotic species infestations
- Sea-level change may impact sea oats communities at lowest elevations of dunes or lead to dune erosion
- Beach armoring or alterations may affect dune formation processes

**Wetland Status** – No

**Global Rarity Ranking**
- G1: Critically Imperiled
- G2: Imperiled
- G3: Vulnerable
- G4: Apparently Secure
- G5: Secure

**Desired Future Conditions**
Sea oats-dominated communities within a dynamic environment characterized by wave action, impactful storm events, persistent salt spray and moving sands
4.2.1.7 FRESHWATER HERBACEOUS WETLANDS SOUTHERN ATLANTIC COASTAL PLAIN CAROLINA WILLOW DUNE SWALE (10), SAND CORDGRASS – SEASHORE MALLOW HERBACEOUS VEGETATION (16), SOUTHERN HAIRGRASS – SALTMEADOW CORDGRASS – DUNE FINGERGRASS HERBACEOUS VEGETATION (17), SOUTH ATLANTIC COASTAL POND (18), SAWGRASS HEAD (20)

Description
Freshwater herbaceous/shrub wetlands dominated by cordgrass or sawgrass in herbaceous wetlands and Carolina willow and large-flowered hibiscus in the shrub wetlands

Key Ecological Attributes
Freshwater hydration sources; Herbaceous community structure; Inundation regimes

Underlying Soils
Rutledge fine sand

Acreage/Percent of the Island
29 acres

Dominant Vegetation
- **Dominant Vegetation:** Carolina Willow Dune Swale - Carolina willow, large-flowered hibiscus, dotted smartweed, royal fern, peppervine, hempweed, wax myrtle, lizard’s tail, pennywort, false nettle;
- **Dominant Vegetation:** Cordgrass Communities - sand cordgrass, southern hairgrass, saltmeadow cordgrass, dune fingergrass, wax myrtle, dog fennel, frog bit, fleabane, rush, bluestem, blackberry, ragweed, knotweed;
- **Dominant Vegetation:** Sawgrass Head - sawgrass, Carolina willow, buttonbush, swamp tupelo, thistle, blackberry, dog fennel, peppervine, wax myrtle, cabbage palm, lizard’s tail

Current Conditions
Encroachment of transitional vegetation; death of wetland shrubs/decrease in area covered by wetland herbaceous species may be indicative of hydrological alteration in cordgrass and sawgrass head communities; staining on willows indicate periodic inundation for sawgrass head, but inundation length may not be sufficient to maintain historical wetland type; all communities except for dune swale appear to be transitioning to a different, potentially non-wetland, vegetation type; dune swale home to large-flowered hibiscus

Threats and Stresses
- Regional groundwater withdrawals
- Encroachment of transitional and upland vegetation
- Development in adjacent uplands could alter surface water hydrology inputs
- Effects on surface hydrology for sawgrass head from nearby excavated pond
- Exotic species infestations
- Sea-level changes to salinity and tidal movement in freshwater marshes connected to coastal marsh
- Shrub growth due to inundation regime alterations and/or altered fire patterns

Wetland Status – Yes

Global Rarity Ranking
- G1 Critically Imperiled
- G2 Imperiled
- G3 Vulnerable
- G4 Apparently Secure
- G5 Secure

Note: G3/G4 (Southern Atlantic Coastal Plain Carolina Willow Dune Swale);
- G3 (Sand Cordgrass – Seashore Mallow Herbaceous Vegetation);
- G2 (Southern Hairgrass – Saltmeadow Cordgrass – Dune Fingergrass Herbaceous Vegetation);
- G3 (South Atlantic Coastal Pond); G2 (Sawgrass Head)

Desired Future Conditions
Freshwater marshes and/or prairies with appropriate shrub growth that exhibit natural (dynamic) hydropериods and support a diversity of native understory and herbaceous vegetation
**4.2.1.8 TIDAL MARSHES SOUTHERN ATLANTIC COASTAL PLAIN SALT AND BRACKISH TIDAL MARSH (21)**

**Description**
Herbaceous-dominated tidal marshes interspersed with creeks and salt pans

**Key Ecological Attributes**
Tidal water fluctuations; Water depth and residence time; Salinity levels

**Underlying Soils**
Bohicket – Capers Association

**Acreage/Percent of the Island**
1,755 acres

**Dominant Vegetation**
- **Dominant Vegetation:** Marsh - smooth cordgrass, glasswort, saltwort, salt grass, needle rush
- **Dominant Vegetation:** Marsh Border - sea oxeye, eastern red cedar, groundsel, marsh elder, saltcedar, cabbage palm, fleabane

**Current Conditions**
Tidally-influenced herbaceous systems often coupled with tidal channels/creeks; community type exhibits multiple plant zones depending on salinity/inundation regimes; plant zones include creek levees, low and high marsh, needle rush and shrub marsh borders, salt pans with limited vegetation, and small shrub islands; portions of the habitat were impounded creating generally open water bodies with variable salinity levels; recreation trails occur on the margins of portions of this habitat; sensitive to brackish/freshwater input changes

**Threats and Stresses**
- Alteration in tidal flow patterns
- New or altered freshwater, pollutant, and nutrient inputs
- Historical impoundments
- Incompatible recreation uses
- Existing trail effects on hydrology
- Development in adjacent uplands that alters surface water flow patterns
- Historical channel dredge spoil deposition
- Exotic species invasion including salt cedar on margins and low islands
- Vegetation zonation changes from increased salinity and higher tidal reach resulting from sea-level change
- Armoring of creek banks or channels with riprap or other hard surfaces
- Broad-scale pesticide application to minimize mosquito growth may affect wildlife in upper trophic layers

**Wetland Status** – Yes

**Global Rarity Ranking**
Common

**Desired Future Conditions**
Predominantly herbaceous communities characterized by multiple plant zones consistent with variable salinity and inundation from tidal fluctuations, dissected by natural creek channels
4.2.1.9 BEACH SOUTH ATLANTIC UPPER OCEAN BEACH (22)

Description
Open sand beaches including the upper beach and subtidal and intertidal sand shoals

Key Ecological Attributes
Tidal cycle; Sand movement; Tidal wrack; Erosion and accretion

Underlying Soils
Beaches

Acreage/Percent of the Island
295 acres

Dominant Vegetation
• Dominant Herbaceous Vegetation: southeastern sea rocket and/or limited to no other vegetation
• Other Common Vegetation: salt meadow cordgrass, railroad vine, beach croton, southern saltwort

Current Conditions
Extensive natural primary dune in southern portions of Island; beach armoring occurs in north-central portions of historical beach; extensive areas of intertidal and subtidal sand shoals present, especially in the southern portion of the Island; variable degrees of disturbance occur throughout Island from pedestrian traffic; Driftwood Beach and northeast portion of Island exhibit reduction in width of beach due to erosional forces, while the beaches in the southern end of the Island are expanding due to accretion

Threats and Stresses
• Requires unhindered longshore currents and up-current sand sources to naturally replenish sand
• Natural process of accretion and erosion may conflict with aesthetic or recreation desires for beach
• Installation of beach armoring such as bulkheads, groins, jetties, and rip-rap that alter natural sand movements and erosion accretion activities
• Sea-level change will likely impact this community and may make it difficult for decision-makers to allow natural processes to run their course
• Placement or location of structures within areas affected by predicted 100 year sea-level change
• Exterior/visible lighting on buildings near sea turtle nesting areas
• Motorized vehicles on the beach
• Soil destabilization from pedestrian traffic
• Trash with tidal wrack or deposited by beach users
• Human-caused disturbances for nesting and roosting shorebirds, sea turtles, and other beach inhabitants
• Effects of fire ants, raccoons, and other native and invasive predators on nesting shorebirds, sea turtles, and other egg-laying beach inhabitants

Wetland Status – No

Global Rarity Ranking

G1 Critically Imperiled
G2 Imperiled
G3 Vulnerable
G4 Apparently Secure
G5 Secure

Desired Future Conditions
Sand beaches and intertidal/subtidal shoals constantly changing with tidal influences with scattered vegetation tolerant of high salinity, dynamic winds and moving sands free of infrastructure intended to avert natural processes of accretion and erosion
4.2.1.10 URBAN/DEVELOPED INCLUDES DEVELOPED, GOLF COURSE, PARKS AND RECREATION, QUARRY/STRIPMINE, TRANSPORTATION, AND OPEN FIELD DESIGNATIONS (24-29)

Description
Residential, commercial, golf course, excavated ponds, and infrastructure portions of the Island; includes open space for lawns, parks, and forested areas

Key Ecological Attributes
Small pockets of natural vegetation; Wildland/Urban interface

Underlying Soils
Carnhoy fine sand, 0-5% slopes; Fripp-Duckson complex, 0-20% slopes; Mandarin fine sand; Mandarin-Urban land complex; Rutledge fine sand

Acreage/Percent of the Island
1,550 acres

27%

Dominant Vegetation
• Dominant Vegetation: lawns; live oak, sand laurel oak, slash pine, landscape plantings

Current Conditions
Land use category includes lands currently used for residential uses, commercial and recreational elements, and supporting infrastructure; the Historic District; developed areas typically include buildings, roads, lawns, and/or scattered landscape plantings; natural vegetation communities occur throughout land use type, including forested areas within the golf course, early successional dune communities within vacant lots, canopy tree structure on lots; pockets of natural vegetation areas within these designations provide important habitat for migratory species; refugia for larger wildlife species that occur or stray into developed lands, and territory for smaller resident wildlife species; exotic species such as tallow have been planted on some residential lots; roadways and trails cross wetland systems to provide access into the Island; excavated ponds occur within the golf course and other areas of the Island

Threats and Stresses
Threats have been identified most importantly for specific natural habitat conservation as opposed to human-made habitats. However, since natural system processes occur within human-made habitats and wildlife still use remnant natural systems within urban settings as well, management strategies and threat assessments are still warranted. The following list of Threats and Stresses are identified for urban/developed lands:

• Habitat fragmentation and edge effects
• Altered wildlife diversity and movement patterns resulting from eradication and colonization
• Exotic species infestations
• Chemical pollution from impervious surface run-off and non-organic herbicide and pesticide treatments
• Fire suppression
• Installation of beach armorings such as bulkheads, groins, jetties, and rip-rap that alter natural sand movements and erosion/accretion activities
• Alteration of natural wetlands due to ditching for drainage
• Water source redistribution in stormwater lagoons
• Development/redevelopment activities
• Water withdrawals for potable use and irrigation
• Light and noise pollution
• Limited seed dispersal due to patchiness of remaining habitat for specific natural habitat conservation, not for man-made habitat

Wetland Status – The majority of this category is not wetland now; Historical wetlands within urban/developed land uses have been extensively altered through vegetation removal, drainage alterations, and fill/dredge activities; Remaining wetlands are typically small and altered in both vegetation composition and hydrology and may not be separately mapped on Figure 3, but may be candidates for future restoration and/or enhancement activities

Global Rarity Ranking
Common

Desired Future Conditions
Residential, commercial, and recreational uses with low-maintenance landscapes of native and non-invasive vegetation, effective stormwater infrastructure, and occupants that embrace natural resource protection on the Island
4.2.2 RARE AND PRIORITY SPECIES

A survey of rare plant species was conducted on the Island in the fall of 2007 by Greg Krakow of GADNR. The results of this survey are included in Appendix G. Notable rare plants found in the survey included small-flowered buckthorn, large-flowered hibiscus, and Florida swamp privet. Bryan England, educator with the University of Georgia 4-H Environmental Education Program, compiled an initial list of priority plant species for Jekyll Island in 2011, which is included as Table 1. This list documents plant species in need of special protection and monitoring on Jekyll Island based on their inclusion on lists produced by the GADNR Nongame Conservation Section and/or rarity on the Island, region, or State. Assuring their long-term viability is a key element in the management actions included in Section 5.0. They are indicators of ecosystem health in a variety of habitats across the Island, and their protection is essential to a successful conservation strategy. A selection of priority species and the habitats they represent follows:

### TABLE 1

**PRIORITY PLANT SPECIES FOR JEKYLL ISLAND**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>State Status</th>
<th>Habitat in Georgia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satin-curls</td>
<td>Clematis catesbyana</td>
<td>Watch List</td>
<td>Dunes and interdune swales with abundant shell hash; calcareous glades and hammocks</td>
</tr>
<tr>
<td>White Spikerush</td>
<td>Eleocharis albida</td>
<td>Special Concern</td>
<td>Brackish pools</td>
</tr>
<tr>
<td>Sand Spikerush</td>
<td>Eleocharis montevidensis</td>
<td>Special Concern</td>
<td>Wet sands on barrier islands; maritime wet grasslands</td>
</tr>
<tr>
<td>Florida Wild Privet</td>
<td>Forestiera segregata</td>
<td>High Priority + Rare + Special Concern</td>
<td>Shell mounds on barrier islands in scrub or maritime forests</td>
</tr>
<tr>
<td>Crimson Marshmallow</td>
<td>Hibiscus coccineus</td>
<td>Watch List</td>
<td>Marshes; sloughs</td>
</tr>
<tr>
<td>Large-Flowered Hibiscus</td>
<td>Hibiscus grandiflorus</td>
<td>Special Concern</td>
<td>Tidal marshes, coastal flatwoods; wet savannas</td>
</tr>
<tr>
<td>Powder-Puff Mimosa</td>
<td>Mimosa strigillosa</td>
<td>Watch List</td>
<td>Floodplain forests; wet grassy openings</td>
</tr>
<tr>
<td>Railroad Morning-glory</td>
<td>Ipomoea pes-caprae</td>
<td>Watch List</td>
<td>Ocean beaches, dunes</td>
</tr>
<tr>
<td>Whisk Fern</td>
<td>Psilotum nudum</td>
<td>Special Concern</td>
<td>Epiphytic in hammocks, Okefenoke Swamp; on palm trunks in coastal habitats; rarely in lawns and sandy openings</td>
</tr>
<tr>
<td>Rouge Plant</td>
<td>Rivina humilis</td>
<td>Special Concern</td>
<td>Coastal shell hammocks, shade to full sun</td>
</tr>
<tr>
<td>Small-Flowered Buckthorn</td>
<td>Sageretia minutilflora</td>
<td>High Priority + Threatened + Special Concern</td>
<td>Calcareous bluff forests; maritime forests over shell mounds</td>
</tr>
<tr>
<td>Soapberry</td>
<td>Sapindus marginatus</td>
<td>High Priority + Rare + Special Concern</td>
<td>Shell mound forests</td>
</tr>
<tr>
<td>Bartram’s Air-plant</td>
<td>Tillandsia bartramii</td>
<td>High Priority + Special Concern</td>
<td>Epiphytic in bay swamps, freshwater tidal swamps; beech-magnolia bluff forests</td>
</tr>
<tr>
<td>Ball-moss</td>
<td>Tillandsia recurvata</td>
<td>Special Concern</td>
<td>Epiphytic in live oak maritime forests</td>
</tr>
</tbody>
</table>

**Shell Midden/Calcium-Loving Species**

A number of priority plant species, including satin-curls, Florida wild privet, rouge plant, small-flowered buckthorn, and soapberry occur on the shell midden in the southwestern portion of the Island and/or potentially on other soils with abundant calcium on the Island. These high-calcium soils typically occur in middens or other areas with large accumulations of shells. Many of the locations that were home to this vegetation type have been lost or destroyed outside of the Island.

**Marsh/Wetland Species**

Several species are found in coastal marsh or freshwater wetland systems, including white spikerush, sand spikerush, powder-puff mimosa, crimson marshmallow, and large-flowered hibiscus (also known as swamp hibiscus). The large-flowered hibiscus is a large, showy species characteristic of this group located within both freshwater marsh and freshwater wet grasslands in various spots throughout the Island. This species is sensitive to alterations in inundation regimes, salinity levels, and other disturbances to the wetland habitats in which it occurs.
4.2.3 INVASIVE EXOTIC PLANT SPECIES

A number of invasive, exotic species are known to occur on the Island. Many of these initially occurred within the developed land use category, where they were planted as part of aesthetic or landscape improvements. Although much of the Island is relatively free of invasive exotic plant species found elsewhere in Georgia, several species have established in the natural systems on the Island, including lantana, camphor tree, Chinese tallow, and salt cedar among others. The survey conducted by Greg Krakow in 2007 also noted general occurrence density and locations for several invasive exotic plant species (Appendix G). An update to the exotic species survey has recently been completed by Bryan England, and it follows the data provided by Krakow in Appendix G. The Jekyll Island Design Guidelines also include a list of invasive exotic species for the Island.


Sea Turtle Nesting Link: http://www.seaturtle.org/nestdb/index

An array of specific data has been, and is currently being collected on the unique wildlife resources of Jekyll Island. The Georgia Sea Turtle Center compiles data on nesting sea turtles within Jekyll Island and collates these with data on nesting sea turtles collected by other researchers in Georgia, including GADNR, and across the world (see the Sea Turtle Nesting Link for regularly updated data). There is a bird banding station on Jekyll Island, and these data are a part of the focus on Jekyll Island as an Important Bird Area. All bird-banders working on the Island are required to have permits and to undergo specific training. The 2008 data from the station are included as Appendix J.

Georgia DNR has conducted extensive field work on Jekyll Island, including surveys for rare and listed species of plants and wildlife. Figure 4 depicts the locations of a large number of species with highest priority conservation status from previous GADNR survey work on the Island. An assortment of other natural resource entities, university researchers, and volunteers are collecting data on wildlife across the Island. Many of these studies are referenced in the Management chapter of this Plan.

4.3 WILDLIFE

Appendix D depicts the floral and faunal lists compiled during the work for the interim conservation plan. The list includes plants, selected invertebrates, and vertebrates that have been verified to occur, probably occur, or could occur on the Island. In addition, species profiles were compiled for selected species of plants and animals and for a number of habitat types that occur on the Island. Appendix E from the interim conservation plan contains these profiles.

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4.3.1 PRIORITY SPECIES

Brad Winn, Conservation Planning Committee member, and Program Manager for the Nongame Conservation Section of the Georgia DNR compiled a list of priority wildlife species for Jekyll Island (Table 2). This list is a subset of the State’s priority wildlife species list included in the State’s Wildlife Action Plan. It highlights a group of wildlife species that are most sensitive to ecological threats and stresses. Assuring their long-term viability is a key element in the management actions included in Section 5.0.

FIGURE 4
LOCATION OF SPECIES AND COMMUNITIES OF HIGHEST PRIORITY CONSERVATION STATUS
# TABLE 2  
## PRIORITY WILDLIFE SPECIES FOR JEKYLL ISLAND

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Federal Status*</th>
<th>State Status</th>
<th>Habitat in Georgia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachman’s Sparrow</td>
<td>Aimophila aestivalis</td>
<td>Rare</td>
<td></td>
<td>Dry, open pine</td>
</tr>
<tr>
<td>Henslow’s Sparrow</td>
<td>Ammodramus henslowii</td>
<td>Rare</td>
<td></td>
<td>Grassy areas, especially wet grasslands; wet pine savanna &amp; flatwoods</td>
</tr>
<tr>
<td>Red Knot</td>
<td>Calidris canutus</td>
<td>Rare</td>
<td></td>
<td>Beaches and sandbars</td>
</tr>
<tr>
<td>Loggerhead Sea Turtle</td>
<td>Caretta caretta</td>
<td>T Endangered</td>
<td></td>
<td>Open ocean; sounds; coastal rivers; beaches</td>
</tr>
<tr>
<td>Piping Plover</td>
<td>Charadrius melodus</td>
<td>T Threatened</td>
<td></td>
<td>Sandy beaches; mud and sand flats; isolated sand spits</td>
</tr>
<tr>
<td>Wilson’s Plover</td>
<td>Charadrius wilsonia</td>
<td>Threatened</td>
<td></td>
<td>Sandy beaches; sand and mud flats, dunes, and back dune swales</td>
</tr>
<tr>
<td>Green Sea Turtle</td>
<td>Chelonia mydas</td>
<td>T Threatened</td>
<td></td>
<td>Open ocean; sounds; coastal rivers; beaches</td>
</tr>
<tr>
<td>Star-nose Mole</td>
<td>Condylura cristata</td>
<td></td>
<td></td>
<td>Moist meadows; woods; swamps</td>
</tr>
<tr>
<td>Rafinesque’s Big-eared Bat</td>
<td>Corynorhinus rafinesquii</td>
<td>Rare</td>
<td></td>
<td>Pine forests; hardwood forests; caves; abandoned buildings; bridges; bottomland hardwood forests and cypress-gum swamps</td>
</tr>
<tr>
<td>Eastern Diamondback Rattlesnake</td>
<td>Crotalus adamanteus</td>
<td>Species of Concern</td>
<td>Early successional habitats; salt marsh hammocks and flats; maritime forests</td>
<td></td>
</tr>
<tr>
<td>Kirtland’s Warbler</td>
<td>Dendroica kirtlandii</td>
<td>E Endangered</td>
<td></td>
<td>Variety of woodland and shrubby habitats</td>
</tr>
<tr>
<td>Leatherback Sea Turtle</td>
<td>Dermochelys coriacea</td>
<td>E Endangered</td>
<td></td>
<td>Open ocean; sounds; coastal beaches</td>
</tr>
<tr>
<td>Tricolored Heron</td>
<td>Egretta tricolor</td>
<td></td>
<td></td>
<td>Coastal aquatic environments (salt and fresh); nests with other waders in low thick cover</td>
</tr>
<tr>
<td>Swallow-tailed Kite</td>
<td>Elanoides forficatus</td>
<td>Rare</td>
<td></td>
<td>River swamps and upland adjacent habitats particularly with large, emergent pines and pine islands; marshes</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>Falco peregrinus</td>
<td>Rare</td>
<td></td>
<td>Marshes; lakeshores; river mouths; tidal flats; dunes and beaches</td>
</tr>
<tr>
<td>Southeastern American Kestrel</td>
<td>Falco sparverius paulus</td>
<td>Rare</td>
<td></td>
<td>Open country with scattered trees for nesting</td>
</tr>
<tr>
<td>American Oystercatcher</td>
<td>Haematopus palliatus</td>
<td>Rare</td>
<td></td>
<td>Sandy beaches; tidal flats; salt marshes, oyster shell bars</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Haliaeetus leucocephalus</td>
<td>Threatened</td>
<td></td>
<td>Edges of lakes &amp; large rivers; seacoasts</td>
</tr>
<tr>
<td>Black-necked Stilt</td>
<td>Himantopus mexicanus</td>
<td></td>
<td></td>
<td>Shallow ponds; lagoons; isolated freshwater wetlands; dredge spoil sites; managed wetlands</td>
</tr>
<tr>
<td>Least Bittern</td>
<td>Ixobrychus exilis</td>
<td></td>
<td></td>
<td>Freshwater and brackish marshes with tall, dense emergent vegetation; nests close to open areas</td>
</tr>
<tr>
<td>Loggerhead Shrike</td>
<td>Lanius ludovicianus migrans</td>
<td></td>
<td></td>
<td>Open woods; field edges; savannas</td>
</tr>
<tr>
<td>Common Name</td>
<td>Scientific Name</td>
<td>Federal Status*</td>
<td>State Status</td>
<td>Habitat in Georgia</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>-----------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Northern Yellow Bat</td>
<td>Lasiusus intermedius</td>
<td></td>
<td></td>
<td>Wooded areas near open water or fields</td>
</tr>
<tr>
<td>Black Rail</td>
<td>Laterallus jamaicensis</td>
<td></td>
<td></td>
<td>Freshwater marsh grassy margins; wet grassy meadows; brackish high marsh</td>
</tr>
<tr>
<td>Kemp's Ridley</td>
<td>Lepidochelys kempii</td>
<td>E Endangered</td>
<td></td>
<td>Open ocean; sounds; coastal rivers; beaches</td>
</tr>
<tr>
<td>Swainson's Warbler</td>
<td>Limnothlypis swainsonii</td>
<td></td>
<td></td>
<td>Dense undergrowth with heavy litter; canebrakes in swamps and river floodplains</td>
</tr>
<tr>
<td>Marbled Godwit</td>
<td>Limosa fedoa</td>
<td></td>
<td></td>
<td>Mudflats; marshes; beaches</td>
</tr>
<tr>
<td>Bluefin Killifish</td>
<td>Lucania goodei</td>
<td>Rare</td>
<td></td>
<td>Heavily vegetated ponds and streams with little or no current; frequently associated with springs</td>
</tr>
<tr>
<td>Diamondback Terrapin</td>
<td>Malaclemys terrapin</td>
<td>Unusual</td>
<td></td>
<td>Entire coastal estuarine and marine edge; salt marshes; beaches</td>
</tr>
<tr>
<td>Wood Stork</td>
<td>Mysteria americana</td>
<td>E Endangered</td>
<td></td>
<td>Cypress/gum ponds; freshwater marshes; saltmarshes, river swamps; bays, isolated wetlands, and ephemeral wetlands; coastal hammocks</td>
</tr>
<tr>
<td>Whimbrel</td>
<td>Numenius phaeopus</td>
<td></td>
<td></td>
<td>Salt marsh openings; mud flats; shell rakes; outer barrier sand spits</td>
</tr>
<tr>
<td>Mimic Glass Lizard</td>
<td>Ophisaurus mimicus</td>
<td>Rare</td>
<td></td>
<td>Pine flatwoods; savannas; seepage bogs</td>
</tr>
<tr>
<td>Painted Bunting</td>
<td>Passerina ciris</td>
<td></td>
<td></td>
<td>Shrub-scrub and open grassy habitats; open mature pine forest and maritime oak forest associated with freshwater wetlands</td>
</tr>
<tr>
<td>King Rail</td>
<td>Rallus elegans</td>
<td></td>
<td></td>
<td>Freshwater marshes often comprised of cattail, bulrush, and cutgrass for breeding; also brackish marshes</td>
</tr>
<tr>
<td>Black Skimmer</td>
<td>Rynchops niger</td>
<td>Rare</td>
<td></td>
<td>Sandy beaches; isolated accretional sand spits; north and south tips of barrier islands</td>
</tr>
<tr>
<td>Least Tern</td>
<td>Sterna antillarum</td>
<td>Rare</td>
<td></td>
<td>Sandy beaches; sandbars; large flat gravel roof tops</td>
</tr>
<tr>
<td>Gull-billed Tern</td>
<td>Sterna nilotica</td>
<td>Threatened</td>
<td></td>
<td>Outer sand beaches and mud flats; salt marshes; fields on barrier islands; isolated sand spits</td>
</tr>
<tr>
<td>Manatee</td>
<td>Trichechus manatus</td>
<td>E Endangered</td>
<td></td>
<td>Inshore ocean; estuaries; tidal rivers; warm and fresh water discharges</td>
</tr>
<tr>
<td>Bottlenose Dolphin</td>
<td>Tursiops truncatus</td>
<td></td>
<td></td>
<td>Coastal estuarine and offshore waters</td>
</tr>
<tr>
<td>Barn Owl</td>
<td>Tyto alba</td>
<td></td>
<td></td>
<td>Grassland savanna with large cavity trees; neighborhoods with large cavity trees; generally needs open country</td>
</tr>
</tbody>
</table>

* Monitoring efforts and biological assessments of the Island may identify additional species (e.g., small reptiles and amphibians) that may be added to the priority species list for the Island in the future.

E - Endangered
T - Threatened
They are indicators of ecosystem health in a variety of habitats across the Island, and their protection is essential to a successful conservation strategy. A selection of priority species and the habitats they represent follows:

**Sea turtles**
A significant indicator of the health of the nearshore and upper beach environments is the group of federally-listed sea turtles that use the beaches of Jekyll Island. Loggerhead sea turtles are the primary species that nest in the upper beach habitats, but the occasional nesting of green sea turtles and leatherback sea turtles as well as the presence of Kemp’s ridley in the nearshore marine environments highlights the importance of sustaining the quality of Jekyll Island’s upper beach community. These priority species depend upon a wide and undisturbed beach without distractions from lights in residential and commercial structures for reproductive success.

**Wintering shorebirds**
Similarly, a litany of shorebirds that stage or winter on Jekyll Island depend upon the health of the intertidal and upper beach systems for resting and foraging. These species include red knot, the federally-listed piping plover, marbled godwit and whimbrel. The beach systems in the southern end of the Island are currently relatively free of frequent human access, lights from adjacent development, and other disturbances, and characterized by a natural transition from upper beach to maritime forest. Sustaining the quality of these habitats and limiting disturbance are key elements of the Conservation Plan.

**Nesting shorebirds**
A number of the selected priority species are known to, or have the potential to, breed and roost in the Sea Oats Alliance community type. These include Wilson’s plover, least tern, black skimmer, and American oystercatcher. The variety of nesting habitats in the transitional zones in the southern portion of Jekyll Island provide ideal habitat for nesting shorebirds, and at this point the area is relatively free of frequent human access, lights from adjacent development, and other disturbances. Controlling access, limiting dogs and feral cats, and sustaining the ongoing monitoring program for the species are key elements of the Plan.

**Open prairie birds and reptiles**
Several of the priority species occur in early successional habitats, open savannas, or open prairies. These species include eastern diamondback rattlesnake, loggerhead shrike, southeastern American kestrel, painted bunting and barn owl. The species are relative habitat generalists in that they could occur in open areas across the Island. The early successional communities in the southern portion of the Island reflect ideal conditions for this suite of birds.

**Forest dwelling species**
The Maritime Hammock and Pine forests across the Island provide habitat for a wide variety of species, some of which are deemed priority. Those which depend on healthy forests and the historical biological diversity associated with them include Rafinesque’s big-eared bat and to a certain degree Swainson’s warbler and the mimic glass lizard. Managing the historic species diversity and structure of these forests is critical to sustaining the potential for these priority species.

**Bachman’s and Henslow’s sparrows**
Though there is some debate about whether mature pine forests were part of the historical natural communities of Jekyll Island, or they were encouraged by historical land-use alterations, the Island currently exhibits substantial areas of slash pine flatwoods in the northern portion of the Island. To the extent that these forests are managed by periodic fire and sustain an open, grassy understory, they could provide habitat for Bachman’s and Henslow’s sparrows.

**Wading birds and rails**
Wading birds occur in freshwater and tidal marsh habitats across the Island, and a number of these are priority species. Herbaceous freshwater and tidal marshes provide habitat for tricolored herons, least bitterns, black and king rails. Black-necked stilts have been documented to nest in the shallow open areas of these marshes and conservation of these habitats and the dynamic hydroperiods that affect them are key elements of the management plan.

**Wood storks**
The wood stork is listed as a priority species in the State of Georgia. The number of rookeries in Georgia has increased in the last few years, potentially because of the reduced quality of habitat in Florida. A number of other wading birds nest in the wood stork rookery on Jekyll Island and the conservation of this multi-species rookery has been emphasized by its delineation as a Special Protection Area.

**Open water species**
Sustaining hydrology and water quality in estuarine and inshore marine waters may be essential for sustaining their use by bottlenose dolphins, West Indian manatees, and bald eagles. These species require good water quality, predictable hydrology, and habitat that provides for the varied needs of an extensive prey base. In addition, open water species such as dolphins and West Indian manatees can be significantly affected by human interactions ranging from feeding/watering to boat collisions that result from use and access of the open water habitats on portions of the Island.

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*Jekyll Island is an important destination for migrating shorebirds*
Identifying these priority species as indicators of quality, functional (i.e., ecologically viable) habitat places an emphasis on sustaining the complex habitats upon which they depend. The status of each priority species and the habitats that they represent should be assessed with each revision of the plan. This assessment should lead to suggested modifications to the management plan that can provide additional protection for priority species.

### 4.3.2 COMMON WILDLIFE SPECIES

The Island is home to a variety of wildlife species in addition to those designated as priority species that provide notable experiences for visitors to the Island. Several of these species, including white-tailed deer and raccoon, thrive in areas with a mosaic of habitats, including urban, disturbed and open areas associated with residential and other development uses. These conditions can sustain populations that may become nuisance in urban landscapes where natural predators have been eradicated and populations are inflated due to direct and indirect supplemental feeding. While desirable from a wildlife-viewing perspective, these wildlife populations can adversely affect long-term conservation goals by preferentially foraging on propagules and saplings of desirable native plant species (e.g., white-tailed deer) or feeding directly on another target priority species (e.g., raccoons foraging on sea turtle eggs). The development of management techniques for these species requires an understanding of the population size that can be supported by the natural systems with sustained habitat quality, the population size that can coexist compatibly with human population, and the health of the population in question.

Other wildlife species, such as mosquitoes and ticks, are more traditionally viewed as nuisance or pest species, either because of the annoyance inflicted by the species or because of health concerns. Activities that bring people closer to natural systems in which these species reside, such as trails and residential housing near salt marshes, can increase the calls for control efforts to be initiated to decrease the effects of these pest species. While the control efforts may be beneficial from a human comfort or health perspective, they can adversely affect the long-term conservation goals of the Island by decreasing food sources through killing of adult or larval mosquitoes for priority species, decreasing populations of desirable insects also affected by the control efforts, or through the introduction of chemicals that can be bio-accumulated in wildlife species higher in the food chain.

### 4.3.3 EXOTIC SPECIES

Two invasive exotic wildlife species, the redbay ambrosia beetle and the cactus moth, have had or are having a significant impact on resources on the Island. The most visible impact of the two is the death and decline of bay trees within the Island from laurel wilt, which is caused by a fungus transmitted by the invasive redbay ambrosia beetle. First discovered in Savannah, GA in 2002, this beetle has spread rapidly throughout the southeast, especially affecting the redbay trees in maritime forests like those found on Jekyll Island.

The cactus moth has recently been discovered on the Island. This species was used for many years as a biological control agent to remove invasive prickly-pears in Australia and has begun to expand into the southeast apparently from populations used as control agents in nearby Caribbean islands. The caterpillars of the moth feed upon prickly-pear cactus pads, effectively hollowing the pads and ultimately cause the death of the targeted plant. Rare cactus species such as erect prickly-pear may be significantly affected by the spread of this species.

The JIA entered an agreement on March 15th, 2010 to implement a trap, neuter, adopt and/or release program for feral cats. All animals are checked for Feline Leukemia Virus and Feline Immunodeficiency Virus. If tests are positive for either virus, or the cat is deemed unhealthy, it is humanely euthanized. All cats are neutered and vaccinated. Many cats are adopted, while some cannot be adopted because of temperament and are released back on Jekyll Island. Those that are released back on the Island receive a microchip (P.I.T. Tag) for future identification.
5.1 INTRODUCTION

Desired future conditions for each vegetation community and land use on the Island were identified to provide a vision for the ecological structure, diversity, physical condition, and aesthetic over an extended timeframe (50 years) for specific portions of the Island. Many of the desired future conditions share common elements that can provide broader guidance on management practices for overall natural resources within the Island, including:

- Mature canopy conditions in forested systems that still allow for regeneration of canopy species
- Minimal fuel loads provided by duff and herbaceous/shrub vegetation to minimize potential for destructive, uncontrolled fires
- Appropriate shrub/herbaceous layer diversity depending on canopy density
- Stable wildlife populations characteristic to the Island
- Wetlands and coastal creeks exhibiting natural and dynamic hydroperiods sufficient to support a diversity of wetland dependent species
- Multiple seral stages resulting from successional processes in dune/swale barrier island development
- Appropriate plant zonation based on salinity, tidal fluctuation, storm events, and dune/beach dynamics
- Resource-based recreation in natural lands that are compatible with the recreation type

- Residential, commercial, and recreational uses with low-maintenance landscapes of native and non-invasive vegetation, effective stormwater infrastructure, and occupants that embrace natural resource protection on the Island

Achieving these desired future conditions will require an adaptive approach to minimize the effects of the threats identified in Section 4.2 and enhance the natural value of the Island. The following documents general management elements to address Island-wide natural resource issues followed by specific management elements for individual Management Units shown on Figure 5.
FIGURE 5
MANAGEMENT UNITS

Legend

- Plan Area 5,847.2 acres
- Management Units
  - Beach and Interdunal Swale 475.2 acres
  - Dry Hammock 368.4 acres
  - Coastal Marsh 1,905.7 acres
  - Upland Forest 1,068.9 acres
  - Golf Course 929.6 acres
  - Urban / Park 1,099.4 acres
5.2 ISLAND-WIDE MANAGEMENT

General management objectives and strategies address management issues that affect Island-wide natural resource issues. They provide the overarching framework for implementing management actions on the Island and serve as a first-order test for confirming adaptive approaches to the management plan.

OBJECTIVE A – COMPREHENSIVE FIRE MANAGEMENT PROGRAM

Discussion: The Island is comprised of a variety of naturally-vegetated areas influenced by the presence, or absence, of fire. Fuel loads and fuel laddering create conditions that increase the likelihood of more frequent, and potentially more intense, fire within habitats like pine flatwoods and live oak hammocks. They also make safe application of prescribed fire more problematic. Although prescribed fire is often a desired management tool to use, other mechanical tools such as bushhoggning, rollerchopping, or hydroaxing are often needed to “reset” the conditions for safe application of prescribed fire or decrease the height and density of natural fuels within areas where fire and its associated smoke are problematic. These techniques can have negative effects on vegetation communities through soil compaction and decreased nutrient cycling and wildlife communities through direct mortality and cover/forage changes. Still, they provide a better alternative than a stand-altering fire. Special care to address potential negative aspects of these tools, coupled with appropriate prescribed fire after mechanical management use can assist in reducing devastating fire risk and promoting desirable habitat conditions.

Strategies:

• Create and implement a comprehensive fire management plan that identifies portions of the Island where fire will be actively suppressed vs. prescribed, fire control measures, desired timing and seasonality of prescribed fire, and mechanical management activities; implement prescribed fire and/or mechanical fuel reduction measures on an ongoing basis consistent with the timing and seasonality identified in the comprehensive fire management plan

• Establish a GIS database for recent fires and fuel reduction management activities to document the date conducted, area burned from prescribed fire or wildfire, and/or area treated with mechanical fuel reduction measures; update to document management efforts

• Develop a fire communication protocol for public notification about prescribed burns and mechanical management activities on the Island that specifies communication methods, minimum timeframes for notification to occur prior to management, and goals, timeframes, and anticipated issues related to the activity

• Develop and enforce measures to limit unintentional ignition sources such as campfires

OBJECTIVE B – MINIMIZATION OF HABITAT FRAGMENTATION/LOSS

Discussion: Over the life of the Conservation Plan, future development or redevelopment activities, recreation activities, and roadway improvements have the greatest potential to fragment habitat continuity or result in the loss of natural habitats. Proper siting, design, implementation, and operations may alleviate adverse effects of these activities. In addition, the JIA is currently assessing options for establishing a conservation easement or similar approach for the 65% non-developed portion of the Island. Three options have been identified: 1) a conservation easement, 2) permanent protection through the Georgia Heritage Trust Act or Georgia Natural Areas Act, and 3) creation of a 501(c)(3) non-profit organization with the sole purpose of managing the 65% non-developed portion of Jekyll Island. All of these options have pros and cons and will be thoroughly evaluated during the Master Planning process. Ultimately, the JIA will develop legal instruments and/or organizations to permanently protect the 65% non-developed portion of Jekyll Island.

Strategies:

• Utilize management recommendations for Management Units, Special Protection Areas (SPA), and criteria associated with the landscape-scale evaluation in the Environmental Assessment Procedure (EAP) to provide input to updates to the Jekyll Island Master Plan that delineate and identify the parcels most appropriate for development or redevelopment in order to remain in compliance with statutory limitations on subdividing and improving not more than 35% of the land area of the Island lying above water at mean high tide

• Define and implement specific legal instruments to permanently conserve SPAs and to maintain compliance with statutory requirements for the areas identified within the Jekyll Island Master Plan designated as part of the 65% of the land area of Jekyll Island which lies above water at mean high tide over which subdivision and improvements cannot occur

• Implement the EAP review for any proposed new development or redevelopment, renovation or remodeled residential and commercial projects

• Adopt specific stormwater guidelines to maintain appropriate freshwater/brackish inputs, water quality, and water quantity for wetland systems on or surrounding the Island
• Identify and document road kill locations along all lengths of roadway on the Island; prepare a wildlife movement enhancement plan to minimize wildlife impacts resulting in road kills or wildlife injuries in accordance with the results of the study; implement wildlife protection measures such as culverts, wildlife underpasses, and speed reduction zones as a retrofit project or as funding becomes available during roadway improvements.

OBJECTIVE C – EXOTIC/INVASIVE/NUISANCE SPECIES MANAGEMENT

Discussion: Invasive exotic species can radically alter vegetation structure and composition, the natural processes on which a particular vegetation type or wildlife species depends, and/or the health and viability of species affected by the exotic species. Minimizing the effects of exotic invasive species is dependent upon effective monitoring followed by focused, timely control efforts as well as policy and implementation actions to minimize activities that would create or maintain conditions favorable for undesirable population growth or behavior of pest species. Once populations are identified and mapped, future appropriate management efforts can be targeted to remove the species with minimal effects on other species in the area. Invasive plant species such as salt cedar, Chinese tallow, and lantana can spread rapidly from seed and underground roots. While reinfection from on- and off-site propagule sources can be difficult to prevent, control at minimal levels can be effective with vigilant monitoring. Similarly, monitoring for new invasive wildlife species such as feral hogs and armadillos or a disease vector like the Ambrosia beetle can assist in proactively removing or controlling incipient populations. Native species can also become nuisance species by affecting human health and/or comfort (i.e., mosquitoes, ticks), aesthetics of developed areas (e.g., white-tailed deer browsing on landscape materials, raccoons in trash cans), negatively affecting priority species for which other management activities are targeted or due to perceived and/or misperceived ideas about the danger posed by individual animals or wildlife populations (e.g., alligators, snakes). While these potentially dangerous animals require certain precautions, their natural threats do not warrant active removal, but should be countered with proactive education, research, and management.

Strategies:

• Sustain the qualitative monitoring program to identify the locations, extent occupied, and/or occurrences of invasive plant and wildlife exotic species on the Island and develop a GIS database of existing exotic plant and wildlife species locations for long-term tracking

• Continue to implement exotic plant control

• Work with regional partners to identify treatment and remediation for Ambrosia beetle/laurel wilt infestations and cactus moth effects on the cactuses of the Island

• Monitor the Island for exotic species found in the region but not yet on the Island and prepare contingency plans to proactively address if found

• Prepare a mosquito control plan in coordination with Glynn County Mosquito Control to address human health concerns from mosquito populations, while minimizing the effects on biologically relevant mosquito populations important for forage and nutrient dynamics for other wildlife species. At a minimum, this plan should address areas in which human health concerns are posed by mosquito populations, specification of potential ecological harm, areas and time intervals in which control measures are proposed, notification standards for control efforts, and periodic restrictions of control efforts (e.g., peak fish spawning times).

• Continue to implement the management efforts to control raccoons using humane methods to limit depredation of sea turtle nests on the loggerhead nesting beach

• The JIA will establish a committee to assess populations of native wildlife whose numbers affect the ability to meet the objectives of this Plan and develop recommendations for managing populations consistent with this Plan. Initially, this committee will at least include a review of the white-tailed deer and raccoon populations. The existing pet ordinance will suffice for issues associated with feral cats and free-ranging housecats at this time. Conflicts associated with alligators and snakes may be deemed nuisance, but since they are top predators in ecosystems, their populations are self-regulating. Where possible, conflicts with alligators and snakes in particular, and native nuisance wildlife in general, should be managed using alternative techniques such as education and behavioral adjustment measures.
- Continue to implement the trap, neuter, adopt and/or release program for feral cats
- Continue to implement program that precludes JIA employees from feeding wildlife
- Develop educational materials to inform residents and guests of the issues associated with feeding wildlife

**OBJECTIVE D – HYDROLOGICAL ALTERATIONS**

**Discussions:** Groundwater reductions from industrial use and potable water supplies may be a significant source of hydrological alterations for wetlands on the site. Surface water alterations resulting from historical drainage or development projects, stormwater routing, and constrictions on tidal flow from culvert construction can have further effects on the hydrological conditions of natural systems. Understanding the relative role of groundwater reductions, in comparison to surface hydrology changes, is necessary to evaluate potential hydrological enhancements for degraded wetlands.

**Strategies:**
- Work with regional partners to assess current groundwater levels on and around the Island and determine their effect on wetland hydrology
- Coordinate with regional partners to restore groundwater levels in order to restore freshwater wetland function over time
- Monitor salinity levels within freshwater wetland systems and ponds for saltwater intrusion
- Design/implement stormwater plans for new development and/or retrofit projects with direct discharge into wetlands or other surface (i.e., Low-Impact Development designs) that capture stormwater discharge from impervious surfaces and encourage infiltration into the surficial aquifer
- Establish a long-term hydrological monitoring program for wetlands and use data obtained from the monitoring program to identify wetlands requiring surface water enhancements; implement enhancements when funding becomes available or as mitigation projects

- Develop a database that documents the discharge rates, and locations of all freshwater discharge into the salt marshes; implement enhancements to culverts and control structures to remove impediments to natural tidal fluctuations and surface water drainage patterns in coastal marshes and freshwater wetlands
- Studies on carrying capacity of the Island relative to water supply and effluent disposal will be addressed in the Master Plan
- Encourage the use of native plants and other non-invasive low water use plants within landscapes for existing residential, commercial, and civic sites as well as new development parcels
- Implement water conservation measures for outdoor water use through various measures (e.g., water use efficient irrigation methods, outdoor water use ordinance)

**OBJECTIVE E – PROTECT PRIORITY WILDLIFE SPECIES**

**Discussion:** Many of the priority species for the Island occur in systems that are subject to some degree of regulation or long-term constraint, such as wetlands or beaches. While this does not eliminate potential impacts, the regulations and constraints can provide enforcement measures and/or decrease the risk of potential adverse long-term activities such as land conversion. However, continued vigilance is still required to ensure adequate protection is maintained. Additional management requirements may be needed for priority species occurring outside of these regulated systems.

**Strategies:**
- Monitor the status of priority species and the disposition of the habitats upon which they depend
- Collaborate with resource partners on research and monitoring efforts for priority species
- Emphasize the implementation of management actions that affect priority species, and consider the effect on priority species with all management actions
- Coordinate with the US Fish and Wildlife Service to enforce regulatory requirements of the Endangered Species Act, including designated Critical Habitat areas, for federally listed wildlife species
• Protect and buffer the wood stork and wading bird rookery, and shorebird nesting areas

• Incorporate priority species protection within the comprehensive beach management plan

• Conduct periodic (at least every 5 to 10 years) biodiversity surveys of the Island through staff, partners, or qualified citizen volunteers to update documentation on rare and priority species distributions, vegetation community quality and distributions, and exotic species occurrences

• Develop and maintain a central clearinghouse for biodiversity information obtained on the Island that is publicly available

• Identify additional priority species for the Island that are currently undocumented in order to supplement the list included herein and develop appropriate monitoring programs that incorporate these species

• Establish standard operating procedures (SOP) for bird banding on Jekyll Island, including birds included on the priority species list, that address the need for humane handling of birds and provide guidelines to lessen the potential for disease transmission during the banding process

OBJECTIVE F - MANAGEMENT

IMPLICATIONS FROM RECREATION TRAILS

Discussion: A general assessment of existing facilities and connecting trails was conducted to evaluate points of public access and determine how the network of existing trails could serve to define Management Units (Figure 6). The Island’s existing overall resource-based recreation system is well-used and well-designed. The interconnected network of loop trails, numerous access points and picnic areas, and wide variety of recreation types create a successful recreational system that provides users of all ages and skill levels access to the Island’s unique natural and historic resources. The existing trail system provides access to a wide variety of recreation opportunities throughout the Island as well as potential access locations for management activities. New trails will be limited in extent and may only be added as needed for management, educational or recreational purposes. Access to some trails may be permanently or temporarily restricted for management (e.g., fire breaks) or education (e.g., field programs) activities. The appropriateness of any proposed new trails will be evaluated using the EAP defined in Section 7 of this Plan to evaluate potential fragmentation, habitat disturbance, and edge effects that may result from the new trails.

Strategies:

• Develop a recreational trail map that includes the location and type of travel allowable (foot, bicycle, equestrian), how to safely observe wildlife (from a distance and no feeding), and how to reduce the footprint of potential impact

• Determine the appropriateness of any proposed new trails using the EAP defined in Section 7 of this Plan: evaluate potential fragmentation, habitat disturbance, and edge effects that may result from the new trails

The least tern is a priority wildlife species on Jekyll Island
5.3 CAUSEWAY MANAGEMENT

**Discussion:** A causeway was built from Route 17 to join the Island to the mainland after the State of Georgia acquired the Island in 1947, but the bridges were not completed until 1954 due to an iron embargo during the Korean War. The construction of the causeway resulted in the filling of numerous acres of salt marsh and dramatically altered the tidal hydrology of Jekyll Creek as several tributaries were completely cut off or redirected as a result of the causeway construction. These alterations in tidal hydrology significantly compromised the ability for Jekyll Creek to flush itself naturally. As a result, it now requires constant dredging in order to keep it fully navigable at low tide. Additional fill material also washed or seeped into the adjacent salt marsh, creating artificial high marsh along large stretches of the perimeter of the causeway. The causeway and associated salt marshes occur outside the primary study area for this Plan and are excluded from any acreage calculations associated with the 35/65 designation. However, the causeway is a significant feature associated with the Island because of the significant visitor experience and access it affords in addition to the ecological ramifications it has on tidal creek and salt marsh ecology for the region and the Island. In addition, long-term research on diamondback terrapins and other coastal species is being conducted on the causeway, including work by GSTC staff focused on rehabilitation of terrapins injured by automobiles and mitigation techniques to minimize terrapin mortality from automobiles. The causeway is not owned or leased by the JIA, but JIA does provide management assistance and conducts ecological research on and adjacent to the causeway.

**Management Priorities:**
1. Maintain road buffers and open vistas for the salt marshes along the causeway
2. Restore/enhance the hydrology of Jekyll Creek and the salt marshes affected by the causeway
3. Conduct an assessment of impediments to wildlife movement and flow patterns
4. Continue ecological research on diamondback terrapins and other coastal species

**Strategies:**
- Implement the causeway vegetation management plan included in Appendix K to manage protected buffers, vistas, wildflower plantings, exotic species control, and shoulder mowing as funding and staffing sources become available and continue to coordinate management efforts with Georgia Department of Transportation (GDOT)
- Identify and implement structural improvements to the road that reconnect Latham Creek under the causeway in association with GDOT
- Identify locations for and implement construction of culverts or other structural improvements to improve hydrological connections and tidal exchange under the causeway for salt marshes in the vicinity
- Continue to implement research on wildlife affected by the bisection of the salt marsh, including diamondback terrapins, on and adjacent to the causeway and document the results of these findings on publicly available sources
- Develop road mortality and fragmentation mitigation strategies (design and engineering) to reduce the effects of the causeway on adjacent natural communities
- Examine the effect of the causeway as a corridor for exotic dispersal to the Island and as a source for undesirable population supplementation for native species (e.g., raccoons)
Diamondback Terrapin Conservation Program: Approximately 250-300 adult diamondback female terrapin deaths occur annually due to automobile-induced mortality on the causeway. The ongoing terrapin conservation program (Appendix L) is a collaboration between GSTC and University of Georgia programs for comprehensive conservation-based research, mitigation, rehabilitation of injured terrapins, and education. Conservation-based research includes graduate student programs to evaluate potential mitigation efforts to reduce terrapin mortality from automobiles. Visit www.georgiaseaturtlecenter.org for detailed information about the program.

5.4 SPECIFIC AREA MANAGEMENT

The Island has been divided into six units comprised of vegetation communities and land uses that exhibit similarities in location, management requirements or constraints, or ecological function (Figure 5). Each of the Management Units is comprised of multiple land uses and/or vegetation types described in Section 4.0 of this Plan. As such, the acreages noted for each Management Unit may not correspond directly with the acreages noted for the land uses and vegetation types noted in Section 4.0. The six Management Units are comprised of the following:

1. Beach and Interdunal Swale – Beach, primary dune, and early successional back dune/swale systems;
2. Dry Hammock – Naturally vegetated forested systems in the southern third of the Island;
3. Coastal Marsh – Salt marshes, coastal creeks, and small forested islands;
4. Upland Forest – Pine and oak forests of the northern third of the Island along with pockets of forested freshwater wetlands;
5. Golf Courses – The four golf courses, forested systems within the golf courses, and the adjacent forested, freshwater wetlands;
6. Urban/Parks – Residential, commercial, Historical District, and park land uses along with altered natural systems.

The management and conservation of natural resources on the Island requires actions throughout the entire Island. As such, urban land uses such as the Golf Courses, Developed, Roads, and Parks/Recreation are included within Management Units in the Conservation Plan. These land uses retain naturally vegetated habitats that benefit from management activities such as fire control and exotic species removal and provide habitat for a variety of resident and migratory species that frequent the Island. In addition, these land uses abut larger areas of natural vegetation and can significantly influence the long-term quality and management actions for these larger natural systems. Urban land uses were designated into two separate Management Units based on existing conditions and anticipated long-term management requirements (e.g., the Golf Course unit is comprised of the golf courses and various natural systems inside or adjacent to the courses that are most affected by activities within the golf courses, Urban/Park includes residential, commercial, and roadway areas) and management priorities and strategies were identified.

The Master Plan defines the boundaries of the 65% of the Island identified to be undeveloped, which includes portions of the lands occurring within the Golf Course and/or Urban/Park Management Units. As such, the acreages noted for these Management Units are not intended to be used to calculate the 35% of the Island in which development activities may occur.

The descriptions that follow provide additional information about the vegetation communities and land uses found within each Management Unit, as well as the types of ecological and physical characteristics that provide the context for management recommendations. Specific management objectives and related priorities are described to address the unique edaphic setting, location, and vegetation communities found within the unit. Lastly, strategies that implement the priorities are provided for each unit.

The management strategies identified in the following have been summarized in Appendix M, which includes the text of each management strategy as well as an estimate of the general timeframe in which the strategy would be implemented. The general timeframes are broken down into four categories:

- Short-Term - first 1 to 5 years of the plan implementation or until the first update to the plan
- Mid-Term - next 5 to 10 years of plan implementation
- Long-Term (rest of the plan duration or 10 to 50 years), and
- Ongoing – tasks that repeat periodically throughout the life of the plan.

These timeframes provide a general framework in which the implementation of proposed strategies can be prioritized but are subject to change as funding and staffing become available and adaptive management requirements are implemented.
UNIT #1
BEACH AND INTERDUNAL SWALE

Represented Communities
This unit occurs primarily in the eastern half of the Island and mostly includes the South Atlantic Upper Ocean Beach and Sea Oats Temperate Herbaceous Alliance vegetative communities. However, the seral stages of beach systems in the southern end of the Island are also included in this Management Unit, including the Atlantic Coast Interdune Swale and Live Oak – Yaupon Holly – (Wax-myrtle) Shrubland Alliance communities.

Ecological and Physical Influences
The vegetation types within this unit are significantly affected by several common ecological and physical factors, including:

• **Erosion and Accretion** – Longshore currents generally erode sands at the northern end of the Island and deposit sediments at the southern end of the Island

• **Wind** – On-shore breezes contribute significantly to the formation of primary dunes adjacent to the open beach and can cause wind erosion in areas damaged by land uses

• **Salt spray** – Salt spray from wave action generated during both general sea conditions and periodic storms affect the soil conditions, plant physiognomy, and community diversity of all systems within the unit

• **Inundation** – The types (freshwater vs. brackish vs. salt water) of water inputs, depths of inundation, and duration of inundation have significant influence on plant diversity and density in the back dune systems

OBJECTIVE 1A - MANAGE AND MAINTAIN BEACHES TO ADDRESS EROSION, ACCRETION, STORM EVENTS, AND FUTURE SEA-LEVEL CHANGES

Discussion: Maintaining a dynamic beach and interdunal swale community that supports the physical processes sustaining habitat and the beach aesthetic must balance priority species needs, changes in the physical processes (e.g., sea-level change), and public view of proposed actions.

Management Priorities:
1. Determine when management actions such as dune restoration and sand re-nourishment should be considered to sustain biological diversity
2. Prepare for an increase in dynamic storm events/sea-level change through native plant re-vegetation, dune restoration, and conservation of buffers
3. Minimize soil disturbances in dunes, interdune swales, and successional vegetation communities along the youngest dune systems across the Island

Strategies:
• Establish a Beach Management Working Group that will develop a comprehensive beach management plan for the Island. This Group will provide a plan, timeline, and implementable actions to have a natural dune system as the first order of beach protection from storm events and systematic erosion across the Island. The Group will consider impacts from human traffic/recreational use including revetments, long-term effects of sea-level change, barrier island migration, and up-current sand source alterations to provide a beach stabilization/renourishment decision matrix for the Island. The Group should include, among others, a representative of the JIA, the public, a beach restoration specialist, and an expert on the ecology of the priority species that depend on these communities
• Conduct an Environmental Assessment Procedure (EAP) review to evaluate new crossings, infrastructure, or restoration projects that may be proposed in this unit
• Develop a GIS database to document areas in which soil disturbance has occurred that has the potential to destabilize beach, dune, or swale conditions and identify potential restoration, enhancement, or other rehabilitation procedures; implement restoration and rehabilitation procedures consistent with the Beach Management Plan.

• Develop a GIS database of locations where the natural vegetation provides a screen to limit salt spray intrusion into interior portions of the Island as well as locations where this natural salt screen has been altered; identify and implement planting protocols or other rehabilitation techniques to limit salt spray intrusion into interior portions of the Island in locations where the natural salt screen has been altered.

• Identify and map the areas most likely to be affected by projected sea-level change and incorporate this information into the base maps for the defining building footprints in the future Master Plan.

OBJECTIVE 1B - PROTECT WILDLIFE SPECIES THAT NEST, ROOST, OR ARE FULL-TIME INHABITANTS ON BEACHES

Discussion: The Island is an important nesting site for sea turtles and a significant roosting and foraging area for beach-obligate birds such as red knot, wintering piping plover, and Wilson’s plover. Recreational use of the beach, especially in the southern portion of the Island, has the potential to affect the viability and success of nests and disturb these and other species throughout the year.

Management Priorities:
1. Maintain or enhance existing hydrology of wetlands to benefit priority species
2. Protect red knot staging areas, wintering piping plover, and Wilson’s plover nesting habitat in the south end of the Island and sea turtle nesting habitat in beach habitats across the Island

Strategies:
• Develop and implement an access management plan for controlling human access to sensitive areas in the south end of the Island; the plan should address, at a minimum, methods to provide Jekyll Island residents and guests access, passive (e.g., signs, gates, etc.) and active (e.g., enforcement actions) access control methods and enforcement procedures, and public communication protocols to address beach closures.

• Develop/update tracking tools for sea turtle nesting habitat and red knot staging areas, wintering piping plover, and Wilson’s plover nesting protection measures for long-term monitoring efforts.

• Strictly enforce lighting ordinance measures for adjacent lands to limit light impacts to beaches.

• Implement the EAP review for any proposed new development or redevelopment, renovation or remodeled residential and commercial projects that are proposed to be built near the beach that could expose the beach to artificial lighting.

• Identify additional vertebrate and plant priority species on the beach that warrant special protection and monitoring.

• Create and implement an education program to further public awareness and reduce effects of human activities on the priority species.
UNIT #2
DRY HAMMOCK

Represented Communities
This unit occurs in the southern third of the Island and is comprised primarily of the Maritime Live Oak Hammock vegetative community. Additional small-scale vegetation communities surrounded by the dry live oak hammock are also included in this unit, including:

• Maritime Slash Pine Upland Flatwoods
• Southern Atlantic Coastal Plain Carolina Willow Dune Swale
• Red Maple – Tupelo Maritime Swamp Forest
• Coastal Salt Shrub Thicket
• Blackberry – Greenbriar Successional Thicket
• Sand Cordgrass – Seashore Mallow Herbaceous Vegetation
• Southern Hairgrass – Saltmeadow Cordgrass – Dune Fingergrass Herbaceous Vegetation
• South Atlantic Coastal Pond
• Successional Broom-sedge Vegetation
• Southern Atlantic Coastal Plain Salt and Brackish Tidal Marshes

Ecological and Physical Influences
This unit occurs in a relatively narrow strip in the south-central portion of the Island. Although comprised of a number of different habitat types, the dominant Dry Live Oak Hammock provides the matrix for the establishment of management requirements for the unit. Ecological, physical, and aesthetic influences for this unit include:

• Fire - Whether prescribed or wild, fire would negatively affect canopy composition, age structure, and aesthetics due to fuel loads
• Canopy Regeneration - The (extremely slow) process of regenerating canopy species sustains the forest structure
• Hydrological Alteration - Wetlands within the unit have been affected by regional groundwater alterations and/or alterations to surface water flows

OBJECTIVE 2A – RARE PLANT COMMUNITY AND SPECIES CONSERVATION

Discussion: The Carolina Willow Dune Swale community with large-flowered hibiscus is a unique wetland community for the Island. Other large-flowered hibiscus locations such as the margins of the pond near the Convention Center are important populations for this species as well. Bartram’s air-plant and whisk fern also occur within the Dry Hammock Management Unit.

Management Priorities:
1. Document existing conditions and specific requirements for large-flowered hibiscus, Bartram’s air-plant, and whisk fern populations, and manage to sustain or enhance these communities
2. Manage trail access and roadway improvements around wetlands to limit alterations to the community

Strategies:
• Work with a university, resource agencies such as the USGS, or citizen scientist programs to research the physical characteristics such as hydrological regime and existing conditions that sustain this community
• Conduct an EAP review for any development, infrastructure retrofits, or trails occurring within 100 feet of the Carolina Willow Dune Swale community
• Incorporate the Carolina Willow Dune Swale community into the Island-wide hydrological monitoring program
• Conduct surveys of this habitat to monitor existing populations and to evaluate the unit for additional populations of rare plant species occurring within the unit

OBJECTIVE 2B – MAINTAIN HABITAT CONNECTIONS

Discussion: This Management Unit exists in a relatively continuous block of diverse habitats extending north/south between Beachview and Riverview Drives and east/west between the salt marshes and beach. Protection of these continuous habitats will maintain the characteristic aesthetic of the southern end of the Island as well as maintain wildlife movement corridors in the area.
**Management Priorities:**
1. Protect the habitats between the two roadways

**Strategies:**
- Evaluate any projects proposed to occur between the two roadways with the EAP process and maintain landscape-scale connections (both north/south and east/west) that currently occur

**OBJECT 2C – HABITAT MANAGEMENT AND ENHANCEMENT**

**Discussion:** Several of the wetland systems occurring in this unit exhibit signs of hydrological alteration, including transitional vegetation encroachment and limited inundation/saturation. Pine flatwoods systems that would benefit from fire occur as small pockets within an otherwise infrequent to rarely-burned matrix of live oak hammocks.

**Management Priorities:**
1. Maintain or enhance the quality of wetlands within the unit
2. Sustain native canopy diversity and age distribution for oak-dominated areas and allow succession to occur in pine flatwoods
3. Improve habitat compatibility of development/altered habitat areas within the unit
4. Incorporate the trail network as part of fire control features
5. Limit hiking/biking to within identified trails to limit entry into wetlands and sensitive upland areas

**Strategies:**
- Limit fires within the unit to maintain oak canopy
- Limited fires may be useful within pine flatwoods areas and herbaceous wetlands if effective small-scale units can be established consistent with the comprehensive fire management plan;
- Develop a GIS database documenting connections and culverts under Riverview Drive that may impair tidal flow into historical salt marshes within the unit; implement culvert modifications in conjunction with salt marsh improvements in the adjacent coastal marsh Management Unit to improve tidal flow under Riverview Drive
- Provide signs, fences, trail markers, and other structures to encourage pedestrian use along trails
- For fire-damaged or other canopy-loss areas (i.e., laurel wilt), evaluate needs for canopy species reintroductions
- Conduct surveys to identify wildlife and plant species that occur in particularly high densities and/or are endemic to vegetation communities within this unit
- Design long-term monitoring programs to document changes in these habitats

Legend

- Dry Hammock 368.4 acres
UNIT #3
COASTAL MARSH

Represented Communities
This unit occurs in the western half of the Island, and is comprised primarily of salt marsh systems, including creeks and ecotones, associated with the Southern Atlantic Coastal Plain Salt and Brackish Tidal Marsh vegetation community. Additional small-scale vegetation communities in this Management Unit include:

• Red-cedar – Live Oak – Cabbage Palmetto Marsh Hammock
• South Atlantic Coastal Shell Midden Woodland
• Coastal Salt Shrub Thicket
• Sand Cordgrass – Seashore Mallow Herbaceous Vegetation
• Southern Hairgrass – Saltmeadow Cordgrass – Dune Fingergrass Herbaceous Vegetation

Ecological and Physical Influences
This unit is comprised of broad areas of salt marsh flats as well as smaller fingers of salt marsh that occur adjacent to tidal creeks and extend interior into the Island. The shell midden and salt shrub thicket vegetation types occur as islands within the greater salt marsh context and have been included in this unit. Ecological, physical, and aesthetic influences for this unit include:

• Tides - The extent and duration of daily tidal inundation are significant influences on vegetation zonation
• Periodic Storms – Inundation, salt spray, and wind changes from storms, including tropical storms, can alter structure and diversity of these systems
• Salinity – Salinity levels driven by differential evaporation rates and/or freshwater inputs influence vegetation structure and diversity
• Inundation Depth – The depths and duration of inundation have significant influence on the community types within the salt marsh
• Flow Constrictions - Physical impediments to water movement provided by structures, roads, fallen trees, or other features can result in altered salinity and inundation levels, thereby affecting vegetation composition

OBJECTIVE 3A – MAINTAIN/IMPROVE SALINITY LEVELS AND WATER QUALITY FOR SALT MARSHES

Discussion: Development activities in adjacent uplands can result in alterations to surface sheet flow and result in concentrated areas of stormwater discharge that alters the freshwater/brackish water balance. These stormwater discharges may also carry altered nutrient loads, which affect water quality of the discharge and can alter organism composition.

Management Priorities:
1. Evaluate water quality of current discharges into salt marshes
2. Minimize or remediate new point-source freshwater inputs to salt marshes

Strategies:
• Establish a program to evaluate, document, and monitor new and existing freshwater discharge locations for potential effects on salinity levels, water quality, and inundation regimes
• Incorporate location and sizing requirements for freshwater discharge points into the Master Plan and/or landscape Design Guidelines
• Retrofit existing stormwater discharges into salt marshes based on data obtained from the documentation and monitoring program
• Enhance, re-route, or remove existing freshwater discharge points to restore historical salinity levels

OBJECTIVE 3B – RESTORE HISTORICALLY-ALTERED SALT MARSH AREAS

Discussion: The salt marshes around the Island have been affected by historical alterations including culverts, impoundments, creek armor ing, and fill deposition. Salt marsh fingers in the interior of the Island maintain tidal connections through culverts under roadways throughout the Island. These culverts and roadways can restrict the free flow of tidal waters and may affect residence time and salinity levels. Impoundments, including the areas near the causeway entrance and adjacent to the trail system in the north end of the Island, were created to provide open water areas from historical salt marsh for wildlife use and hunting purposes. The bike trail on the northern portion of the Island passes through salt marsh habitats and may
affect tidal exchange between the bisected portions of the marsh. Historical spoil deposition from dredging and development activities resulted in the deposition of fill on historical salt marsh in the southern portion of the Island. Although the fill areas are now vegetated with coastal shrub thicket communities, the piles may have altered tidal creek configuration in this area, thereby affecting tidal exchange within the marshes.

**Management Priorities:**
1. Restore the historical channel in the salt marsh in the southern portion of the Island
2. Enhance salt marsh habitats through improved tidal flow and hydrologic patterns in historically impounded areas in the central portion of the Island
3. Improve existing culvert locations/size for compatibility with historical tidal flow patterns; consider converting culverts to bridge spans
4. Retrofit trails to improve tidal exchange

**Strategies:**
- Identify and document hydrological regimes, wildlife uses, and potential downstream areas for historically-impounded salt marsh areas in the central portion of the Island and develop restoration/enhancement plans to increase tidal flow and wildlife habitat availability; initiate restoration/enhancement of impounded salt marshes as funding becomes available or through mitigation projects
- Based on historical aerial photography or mapping efforts, identify creek channels and document tidal exchange patterns in the area south of coastal salt shrub thicket that have been altered by channelization, fill, or other activity and identify a restoration/enhancement plan to improve tidal exchange; restore/enhance creek channels to allow for improved tidal fluctuation within interior salt marshes
- Identify and implement trail retrofits through bridging, culvert improvements, or other mechanisms for the north/south trail along the margins of salt marshes in the northern portion of the Island and the trail that provides access to the coastal shrub thicket
- Retrofit undersized culvert locations in association with road improvements, mitigation projects, or as other funding becomes available to provide improved tidal exchange for salt marshes in the Island’s interior, such as the marshes between Riverview and Beachview Drives in the southern portion of the Island south of the Island entrance and marshes immediately north of the Ben Fortson Parkway/Causeway entrance
- Identify and implement culvert and road removal/repair approaches to increase tidal connections under Crane Road
- Assess the effects of sea-level change on tidal connections to interior portions of the Island and develop restoration/enhancement procedures for addressing sea-level change impacts where feasible

**OBJECTIVE 3C – MAINTAIN COASTAL SHRUB THICKET AND SHELL MIDDEN COMMUNITIES**

**Discussion:** The shell midden community provided a unique habitat for the Island that is home to several rare plant species. The coastal shrub thicket occurs over historical dredge spoil deposition and exhibits large numbers of salt-cedar. Succession in the shrub and canopy species is likely within the coastal salt shrub thicket over a long period of time without fire, storm effects, or other stand-altering actions, while the calciphilic nature and location near Jekyll Sound of the shell midden may limit the rate or possibility for succession. As the coastal shrub becomes populated with canopy trees like pines, the possibility for wildfire may increase.

**Management Priority:**
1. Allow coastal salt thicket to undergo natural succession into a forested system
2. Manage access to shell midden community to limit potential impacts to rare plant and animal species

**Strategies:**
- Suppress fires and/or limit wildfire spread within the salt shrub thicket by using sub-unit boundaries and fire control lines
- Establish a fuel-load and canopy development monitoring program within the salt shrub thicket to determine need for mechanical fuel reduction measures
- Limit the extension of new trails to the shell midden

[Legend]
- Coastal Marsh: 1,890.0 acres
UNIT #4
UPLAND FOREST

Represented Communities
This unit occurs in the northern third of the Island and is primarily comprised of two vegetation communities: Maritime Slash Pine Upland Flatwoods and Maritime Live Oak Hammock. Additional small-scale vegetation communities within the matrix provided by these forested upland communities include:

• Southeastern Florida Maritime Hammock
• Outer Coastal Plain Sweetbay Swamp Forest
• Loblolly-bay Forest
• Red Maple – Tupelo Maritime Swamp Forest
• Blackberry – Greenbriar Successional Shrubland Thicket
• Sawgrass Head
• Urban/Developed (water towers)

Ecological and Physical Influences
This unit is comprised of large blocks of forested systems (both upland and wetland) in the northern area of the Island. Although portions of this unit were used for agriculture in the late 1700s through the mid 1800s, canopy species and structure have re-established and reflect historical conditions (closed canopy, pine with mixed oak dominance). Large portions of this unit exhibit fire-dependent or fire-resistant plant species that are suggestive of relatively frequent fire in the historical past. Small pockets of urban uses, primarily consisting of water tower and/or well locations, have been included within the unit. Ecological, physical, and aesthetic influences for this unit include:

• Characteristic Canopy - The existing canopy provides a characteristic look for the Island
• Fire Fuel Loads - Fuel loads within the majority of the unit pose a risk for catastrophic fire that would radically alter the canopy structure and aesthetic contribution of this community
• Salt Spray - Salt spray affects diversity and vegetation form in portions of the unit near coastal creeks and beaches by limiting establishment of salt-sensitive species
• Hydrological Alterations - Wetlands within the unit have been negatively affected by regional groundwater alterations and/or alterations to surface water flows
• Invasive Fungal Species - Laurel wilt has significantly altered the health, structure, and composition of the understory shrub/sub-canopy through loss of red bays

OBJECTIVE 4A – SUSTAIN LARGE, DIVERSE LANDSCAPE CONNECTIONS

Discussion: This unit consists of three separate blocks of large-scale aggregations of predominantly upland habitats, with salt water marshes and freshwater wetlands embedded within them. Small pockets of urban/developed uses are enveloped by this unit and the adjacent salt marsh in the northern portion of the Island. The northern-most portion of the unit is the least fragmented portion of the Island. The interior portion of the unit north of the golf course includes field roads and three water tower parcels characterized as Transportation (28) or Developed (24) on Figure 3.

Management Priorities:
1. Protect the habitats at the northeastern end of the Island
2. Maintain landscape continuity between the golf course, western salt marshes, and the north Island habitats
3. Decrease wildlife impacts of roadways in areas with east/west wildlife habitat connections

Strategies:
• Evaluate any projects proposed in the unit with the EAP process with the priority to maintain landscape scale connections (both north/south and east/west) that currently occur and that protect the natural communities in the northern end of the Island

OBJECTIVE 4B – WETLAND ENHANCEMENT

Discussion: Historical wetlands within this unit exhibit signs of hydrological alteration, including growth of transitional/upland vegetation on the margins of the wetland. The Sawgrass Head exhibits significant blackberry and dog fennel growth interior to the wetland, while roadways in the northern portion of the unit have altered freshwater exchange from the Outer Coastal Plain Sweetbay Swamp Forest into the salt marsh extension. Many of the canopy trees in the loblolly bay wetland have fallen and/or exhibited subsidence around the bases. Groundwater withdrawals and surface water alterations such as insufficiently sized culverts under field roads and ditches may all play a role in the apparent hydrological alterations.
Management Priority:
1. Evaluate the effects of ditches in and outside of the unit on the hydrology of wetlands

Strategies:
• Monitor natural recruitment of desirable wetland canopy vegetation within the loblolly bay community and Outer Coastal Plain Sweetbay Swamp Forest areas; coordinate with local civic groups or environmental organizations and/or conduct mitigation projects to plant replacement canopy trees if monitoring indicates recruitment is not sufficient to re-vegetate the canopy
• Assess the long-term need for the field road that occurs between the northern end of Outer Coastal Plain Sweetbay Swamp Forest and adjacent salt marsh finger; if needed, evaluate the size and location of the existing culvert for constrictions on hydrological connections between the two systems; replace or enhance as indicated by the evaluation
• Map existing ditches in the unit and adjacent golf course and identify effects on surface water discharge/drainage; develop a ditch closure plan to improve surface water retention/inputs into the loblolly bay wetland

OBJECTIVE 4C – HABITAT MANAGEMENT
Discussion: Large portions of the live oak hammock in this unit exhibit few saplings of the canopy species in the understory. Coupled with the laurel wilt effects on red bay occurrences, the young tree source for canopy replacement after a stand-altering event is limited. Extensive areas of pine flatwoods occur, many of which exhibit fire-dependent or resilient species. At least one portion of the pine flatwoods in the northern portion of the Island has burned within the last 2 years.

Management Priorities:
1. Address fire management comprehensively
2. Sustain canopy diversity and age distribution of both oak and pine habitats
3. Evaluate methods to reduce or remediate effects of laurel wilt fungus

Strategies:
• Address fire management through a comprehensive fire management plan that addresses firebreak locations, Management Unit sizes and control measures, communication protocols for adjacent residents, wildland-urban interface burn issues, use of natural features such as wetlands as control features, and prescribed fire locations
• For fire-damaged or other canopy loss areas (i.e., laurel wilt), evaluate needs for canopy species reintroductions; develop a program in cooperation with local environmental groups or as a mitigation project to install replacement canopy species as needed
• Assess the gap in the forest that will remain as a result of laurel wilt invasion and monitor these gaps for invasive species that could affect forest structure; when applicable, consider returning wilt-resistant bay trees to the landscape
• Manage deer population size and/or access to oak hammock portions of this Unit to create conditions favorable for seedling/sapling recruitment and growth

Legend
Upland Forest
1,067.1 acres
UNIT #5
GOLF COURSE

Represented Communities
This unit occurs in the central third of the Island and is comprised primarily of the golf facilities associated with the four golf courses on Jekyll Island. These golf courses are mapped as Golf Course land use type. Naturally-vegetated forested systems occur in small patches throughout the golf courses as do ponds and streams associated with the drainage infrastructure. The Management Unit includes a small aggregation of naturally-vegetated uplands comprised of Maritime Live Oak Hammock and/or Maritime Slash Pine Upland Flatwoods.

Ecological and Physical Influences
The forested systems interspersed within the maintained fairways, roughs, greens, tees, and stormwater systems of the golf courses provide a mosaic of habitat types and conditions in the central portion of the Island. Although some of these forested areas are “islands” of canopy within the golf course, larger forested blocks occur around the margin of the golf courses, some of which have landscape connections to habitats within other Management Units. These forested communities provide valuable habitat within and adjacent to the golf courses, and should be managed as a natural resource. Many of the forested systems exhibit significant fuel loads, which can pose increased risk for wildfire that would radically change the composition, structure, and aesthetic of these systems. Canals, lakes, and other water alterations within the golf courses have changed hydrological patterns within the central portion of the Island and may be affecting the hydrological regimes of adjacent wetlands. Ecological and aesthetic influences for this unit include:

• Characteristic Canopy - The existing canopy provides a characteristic look for the golf course and a recognizable aesthetic for the Island
• Fire and Fuel Loads - Fuel loads within the majority of the unit pose a risk for catastrophic fire that would radically alter the canopy structure
• Hydrological Alterations - Canals and ponds have reconfigured how water flows through the unit and across the Island and contribute to freshwater run-off into adjacent salt marshes
• Water Quality - Maintenance practices and stormwater treatment ponds affect water quality leaving the unit into adjacent wetlands

OBJECTIVE 5A – RESTORE DISTURBED HABITATS

Discussion: The forested systems within the unit would benefit from fuel load reductions consistent with the comprehensive fire plan. Ditches occur on and adjacent to the golf courses that may affect surface hydrology of wetlands in adjacent units. Within the context of the newly-certified golf courses as Wildlife Sanctuaries, opportunities to increase the compatibility of the course with adjacent natural lands may be possible.

Management Priorities:
1. Identify opportunities for ecological restoration of disturbed habitats that contribute to long-term ecological health of the Island
2. Identify hydrological alterations, including groundwater impacts and ditching, and evaluate opportunities for wetland enhancement
3. Reduce fuel loads or create Management Units that preclude the wholesale spread of destructive fire within forested areas

Strategies:
• Address fire management through a comprehensive fire management plan that addresses firebreak locations, Management Unit sizes and control measures, communication protocols for adjacent residents, wildland-urban interface burn issues, use of natural features such as wetlands as control features, and prescribed fire locations
• Implement ecological restoration projects through budgeted funding, mitigation opportunities, or volunteer projects
• Where applicable, convert landscape to native species that complement the conservation goals of adjacent natural lands

The golf course encompasses patches of mature forested uplands that provide habitat for wildlife
OBJECTIVE 5B – MANAGE THE GOLF COURSES IN A RESOURCE COMPATIBLE WAY

Discussion: The golf courses provide a significant open space within the central portion of the Island. Several of the courses have received certification from Audubon International as Wildlife Sanctuaries. Pesticide and fertilizer use on the courses can have direct or indirect effects on plant and wildlife populations in the natural areas adjacent to the courses if improperly applied. Excessive nutrients can affect water quality of downstream freshwater wetlands and salt marshes.

Management Priorities:
1. Maintain a natural resource-compatible integrated pest management and maintenance program for golf course operations
2. Evaluate effectiveness of current stormwater treatment facilities and identify opportunities to enhance stormwater quality, quantity, and hydroperiods
3. Identify opportunities to incorporate natural features into educational programs and wildlife protection

Strategies:
• Establish a monitoring program for discharges from the stormwater system
• Identify and implement improvements to the stormwater system to enhance water quality, timing, and discharge rates into offsite wetlands
• Evaluate opportunities to reduce irrigation needs and increase use of recaptured and reclaimed water when irrigation is needed
• Implement irrigation reduction measures and recapture/re-use water approaches
• Continue to seek certification from Audubon International in the categories of Environmental Planning, Water Conservation and Wildlife Habitat for all four golf courses

OBJECTIVE 5C – PROTECT AND ENHANCE WILDLIFE SPECIES

Discussion: A wading bird and wood stork rookery occurs within this unit. Maintenance operations and future modifications to the courses should be designed to minimize potential impacts to the rookery. Additional enhancements, such as the plantings noted in the enhancement objective, may also improve habitat values of the lake systems for wildlife species.

Management Priority:
1. Monitor and protect the existing bird rookery
2. Monitor and conduct ecological research on the use of man-made habitats by amphibians and alligators

Strategies:
• Implement protection measures for operations and golf course alterations within 500 feet of the rookery and coordinate the revised protection measures with the USFWS
• Maintain a minimum 500 foot primary buffer zone around the rookery for new development or land uses and coordinate with the USFWS to identify the size of secondary buffers in which new land uses would require coordination under the Endangered Species Act
• Increase awareness of the effects of feeding wildlife, especially alligators found in or near the golf course, on animal behavior and subsequent compatibility of these wildlife species with human uses on the golf course and residential/commercial areas
• Maintain and/or improve water quality to increase habitat viability for amphibians

Legend
- Golf Course 932.4 acres
UNIT #6
URBAN/PARK

Represented Communities
This unit occurs throughout the Island and is comprised of the non-golf course portions of the Urban/Developed communities, including residential lots, educational facilities, parks and open space, the Historic District, commercial land uses, and roads. Small areas of naturally-vegetated forested uplands occur within this unit on the margins of some residential and commercial areas, while disturbed or altered undeveloped (or previously developed) lands are also included.

Ecological and Physical Influences
Although the various development land uses are the most visible component of this unit, small areas of naturally-vegetated communities, altered yet undeveloped uplands, and landscape elements like canopy trees contribute to the ecological function of the Island. Protection and management of these smaller scale natural features can buffer conservation lands and maintain habitat or structural connectivity between habitat patches. Building practices, landscape practices, and operations can also reach beyond the margins of the development use and promote or indirectly affect particular functions in natural areas. Ecological, physical, and aesthetic influences for this unit include:

- **Vegetation Alterations** - These effects may include introduction of exotic species, creation of wind gaps that introduce salt or sand movement inland, crossing locations that result in increased human impacts, and hydrological alteration

- **Water Quality and Flow** - Water quality and salinity of wetlands (both freshwater and tidal) can be affected by direct inputs of stormwater discharge, constrictions to water movement such as berms, control structures, or culvert constrictions, and inundation patterns that are different from historical conditions because of timing, temperature, or nutrients

- **Integration to Overall Island Practices** - Management priorities and actions for this unit require significant coordination with other practices and regulations on the Island, such as the Master Plan, Environmental Assessment Procedure (EAP), Design Guidelines, and various review committees

OBJECTIVE 6A – MINIMIZE FOOTPRINT OF DEVELOPMENT USES ON CONSERVATION LANDS

**Discussion:** The ecological impact of development can extend beyond the physical footprint of structures and facilities. Noise, light, and trash can extend into adjacent natural areas, where they affect the suitability and viability of wildlife use. Expansions to development can lead to habitat loss and fragmentation, especially when additional roadway and stormwater infrastructure is required. Urban/developed areas often serve as sources for exotic species including both wildlife species such as feral cats and plant species that are introduced for other purposes, but find a willing environment for rapid expansion.

**Management Priorities:**
1. Restrict the introduction of invasive exotic species within urban landscapes
2. Minimize fragmentation of, and deleterious edge effects on, natural habitats by future development and roadways
3. Investigate wildlife/people interactions to evaluate health and safety hazards, population effects on nuisance animals provided by food supplies (e.g., garbage) in developed areas, and compatible landscape materials for wildlife use or discouragement
4. Monitor and enforce the beach lighting ordinance

**Strategies:**
- Utilize management recommendations for Management Units, SPAs, and criteria associated with landscape-scale evaluation in the EAP to provide input to updates to the Jekyll Island Master Plan that delineate and identify the parcels most appropriate for development or redevelopment in order to remain in compliance with statutory limitations on subdividing and improving not more than 35% of the land area of the Island lying above water at mean high tide
- Implement buffers for Special Protection Areas identified in the EAP when designing and constructing development/redevelopment projects
- Implement the EAP review for any proposed new development or redevelopment, renovation or remodeled residential and commercial projects.
- Adopt specific stormwater guidelines to maintain appropriate freshwater/brackish inputs, water quality, and water quantity for wetland systems on, or surrounding the Island
- Encourage refurbishment or redevelopment of existing commercial/residential properties
- Require new development, construction, and renovation to utilize “Green and Sustainable Technology” and, where appropriate, achieve certification through LEED, Green Globe or other environmental certification programs
- Implement a public education program for identifying and conveying wildlife impacts associated with feeding some species of wildlife
- Implement and enforce a policy to preclude the introduction of Category 1 or 2 exotic species within the landscape and to require residents to remove existing Category 1 or 2 species as listed by the Georgia Exotic Pest Plant Council (included in Appendix N)
- Update Design Guidelines to incorporate green design requirements of the EAP and preclude exotic species use in landscapes of the Island consistent with the Conservation Plan
- Strictly enforce the beach lighting ordinance

**OBJECTIVE 6B – RESTORE AND ENHANCE AREAS THAT BENEFIT ISLAND ECOLOGY**

**Discussion:** This unit includes degraded natural lands, structures that affect ecological processes in adjacent lands, and development uses that occur as small “islands” within other Management Units. Parks and recreation facilities include a variety of lands ranging from intensive active recreation fields to passive, somewhat altered natural vegetation areas. Enhancements to the natural systems of these parks could be used for education purposes as well as to increase compatibility with adjacent natural systems. Roadways throughout the Island include culverts and drainage features that affect tidal flow and/or freshwater hydrology for wetlands in adjacent units.

**Management Priorities:**

1. Implement ecological restoration of disturbed/altered systems within or immediately adjacent to Management Units 1 through 4 that contribute to long-term ecological health of the Island
2. Sustain canopy diversity and age distribution
3. Encourage recreational uses
4. Evaluate the operations of culverts and drainage features and seek opportunities for hydrological enhancement of freshwater and coastal wetlands

5. Encourage the use of native plant species in landscape palettes for projects located adjacent to Management Units 1 through 4

**Strategies:**

- Develop a restoration database that document the locations of new disturbances, disturbed lands, and existing restoration projects; periodically update database as restoration projects are completed
- Develop or expand active recreation facilities within existing urban/developed land footprint
- Continue to increase use of native species in planting palettes for lands adjacent to Management Units 1 through 4 as designated during the Design Guidelines review process
- For fire-damaged or other canopy loss areas (i.e., laurel wilt), evaluate needs for canopy species reintroductions; develop a program in cooperation with local environmental groups or as a mitigation project to install replacement canopy species as needed
- Manage stormwater to partially offset sea-level change effects on wetland systems on and adjacent to the Island

Legend

- Urban/Park 898.3 acres
5.5 MONITORING

A successful management plan is adaptive to changing environmental conditions, new techniques and relevant research. Understanding the particular aspects of management that are successful requires monitoring and frequent evaluation with comparison to reference sites and desired future conditions. Many of the components of this Plan cite the specific needs for monitoring (e.g., priority species, water quality, exotic species, hydrology). The level of effort assigned to monitoring projects is more often than not driven by funding or staffing restrictions rather than scientific or biological criteria. Definitive plans for monitoring will need to be developed over time. The Objectives from Section 5 above were used to create an outline for monitoring that can be expanded to meet specific needs and budget/funding practicalities that will ultimately define the program.

In general the strategies for implementing monitoring should include:

1. Develop and implement a regularly occurring qualitative and/or quantitative monitoring for natural resources of the Island. Include metrics for issues such as fuel load, exotic and invasive species occurrences, water quality, wetland hydrology, erosion and/or human disturbance to dunes, vegetation structure and diversity

2. Use effective monitoring tools ranging from photo-documentation to quantitative vegetation plots to long-term research studies that yield peer-reviewed publications

3. Organize a central database to compile and evaluate monitoring activities

4. Assess the results of monitoring on a regularly-scheduled basis

5. Use these results to update Objectives, Priorities and Strategies in the Conservation Plan

A preliminary outline for monitoring activities has been based on the Island-wide and specific-area management Objectives. A more detailed approach should be developed to match staffing (including volunteers) and funding levels for implementing the Conservation Plan. This detailed approach can draw upon the diversity of existing monitoring programs as well as a variety of published sources to provide an appropriately scaled monitoring program for the Island.

ONGOING MONITORING

A number of programs are ongoing that can provide the data to meet the monitoring requirements of these Objectives. These programs are highlighted below, along with references to any data that have been collected.

Georgia Sea Turtle Center (GSTC):

The GSTC interfaces wildlife ecological research, rehabilitation and environmental education with marine turtles, diamondback terrapins, freshwater and terrestrial turtles, alligators and various small vertebrates (e.g., snakes, small mammals). Information on these programs is available online but primary programs are highlighted here.

Georgia Sea Turtle Center: www.georgiaseaturtlecenter.org

Marine turtles:

- Tagging nesting loggerhead females at night for population assessments
- Loggerhead nest monitoring and predator assessments
- Rehabilitation of various species of injured (e.g., boat strike, cold stun) turtles
- Satellite tracking of rehabilitated turtles
- Nutrition and dietary assessments
- Lighting surveys to monitor light pollution on the beach and assists with enforcement and education of the Jekyll Island lighting ordinance

Health Assessments:

- Baseline health diagnostics
- Effect characterization through necropsies and live animal diagnostic sampling and analysis
- Taxa include: Turtles (marine, freshwater, terrapin, box turtles); Birds (SEANet), Mammals (raccoons, deer, marine mammals); Alligators; Snakes

Diamondback Terrapin Causeway Conservation:

Approximately 300 female terrapins are hit each year on the Jekyll Island Causeway. All programs have the ultimate goal of reducing this mortality.

- Rehabilitation of injured terrapins
- Incubation of eggs recovered from injured and dead terrapins
- Research: baseline reproductive data, estimates of mortality level, estimates of population status, hot spots for nesting and road crossing
- Awareness and education
- Mitigation: signs to slow traffic, nest mounds and boxes, active surveillance during nesting season and peak time periods to retrieve injured terrapins and assist live terrapins across road

Broad Wildlife Assessments and Conflict Reduction:

- Alligators – island-wide census and habitat use of man-made and freshwater bodies
- Snakes – distribution surveys and development of management protocols and alternatives
- Sea Bird Monitoring Program
Shorebirds:
• Migrating shorebird surveys
• Wilson’s plover nest monitoring
• Snowy plover docent program

Georgia Department of Natural Resources (GADNR):
GADNR has compiled data and management strategies on a variety of wildlife as a part of the State Wildlife Action Plan.
• Sea turtle nesting and stranding data (state-wide and Jekyll-specific)
• Marine mammal stranding
• Waterbird conservation
• Coastal habitat assessment
• GA Wood stork nests

There are monitoring requirements associated with the Audubon Cooperative Wildlife Sanctuary, and a hope that the volunteer efforts of citizen scientists can be coalesced.

JEKYLL ISLAND 4-H MONITORING

Personnel from the Jekyll Island 4-H currently conduct monitoring activities on water quality data and exotic species infestations on the Island. Water quality monitoring is reported through the Georgia Environmental Protection Division (EPD) Adopt-a-Stream program. Exotic species monitoring includes prickly-pear cactus/cactus moth occurrences reported through the Cactus Moth Detection and Monitoring Network.

ISLAND-WIDE MONITORING

Objective: Minimization of Habitat Fragmentation/Loss
Monitoring Framework:
• Identify and document impacts of barriers to movement on wildlife, such as roadways, through documentation of locations of roadkill and reduced wildlife movement permeability, types of species affected, and times of year in which the movement disruption/kills occur

Assessing future risk of catastrophic fire is a key element of the Conservation Plan

Objective: Comprehensive Fire Management Program
Monitoring Framework:
• Establish a GIS database to document prescribed and unintentional fires to capture the date, location of area burned, and acreage burned
• Establish a fuel-load monitoring program to determine the need for fuel reduction measures, which would include monitoring duff thickness, fuel loads by fuel type, and fuel structure (e.g., needle drape)

Objective: Exotic, Invasive, and Native Nuisance Species Management
Monitoring Framework:
• Sustain the existing monitoring program to identify the locations, extent occupied, and/or occurrences of invasive, exotic plant and wildlife species
• Develop a database of existing and future exotic plant and wildlife species locations and areal extent occupied for long-term tracking
• Monitor the Island for exotic species found in the region but not yet on the Island and prepare contingency plans to proactively address if found
• Monitor the gap in the forest that will remain as a result of laurel wilt for invasive plant species that could affect forest structure
• Monitor behaviors of native wildlife species that potentially conflict with human activities
• Exotic invasive species should be monitored and their extent documented on a regular (annual) basis

Objective: Assess Regional Groundwater Alterations
Monitoring Framework:
• Work with regional partners to assess current groundwater levels on and around the Island and determine their effect on wetland hydrology
• Incorporate the Carolina willow dune swale community into the Island-wide hydrological monitoring program and monitoring inundation levels, seasonality of inundation, and during of inundation
• Monitor natural recruitment of desirable wetland canopy vegetation within the loblolly bay community and Outer Coastal Plain sweetbay swamp forest areas

GADNR Website for Citizen Scientists:
http://www.georgiawildlife.com/node/1600

Georgia EPD Adopt-a-Stream:
http://aesl.ces.uga.edu/aascd/db/

Cactus Moth Detection and Monitoring Network:
http://www.gri.msstate.edu/research/cmdmn/
Objective: Protect Priority Wildlife Species

Monitoring Framework:
- Monitor, in collaboration with resource partners, the status of priority species and the disposition of the habitats upon which they depend
- Monitor nesting use and success and protect the existing bird rookery
- Priority wildlife species should be monitored, and their extent documented on a regular (annual) basis

SPECIFIC AREA MONITORING

Objective: Protect wildlife species that nest or roost on beaches

Monitoring Framework:
- Develop/update tracking tools for sea turtle nesting habitat and red knot staging areas; wintering piping plover, and Wilson’s plover nesting habitat

Objective: Manage and maintain beaches and interdunal swale to address erosion, accretion, storm events, and future sea-level changes

Monitoring Framework:
- Develop a GIS database to document areas in which soil disturbance has occurred that has the potential to destabilize beach, dune, or swale conditions and identify potential restoration, enhancement, or other rehabilitation procedures
- Identify the area’s most likely to be affected by projected sea-level change and monitor the vegetation composition and structure, hydrology, and the occurrence of exotic species

Objective: Maintain/improve salinity levels and water quality for salt marshes

Monitoring Framework:
- Monitor new and existing freshwater discharge locations for potential effects on salinity levels, water quality, and inundation regimes
- Evaluate water quality of current discharges into salt marshes

Objective: Manage the golf courses in a resource-compatible way

Monitoring Framework:
- Evaluate the effects of ditches in and outside of the unit on the hydrology of wetlands
- Map and monitor existing ditches in the unit and adjacent golf course and identify effects on surface water discharge/drainage
- Monitor wildlife use and wildlife nuisance reports within the golf course
- Monitor natural resources addressed in Audubon International certifications for periodic recertification requirements

REPORTING

Periodic reports that document the results of monitoring efforts conducted on the Island are helpful to both provide a snapshot of the results of ongoing management as well as provide long-term trend information that can guide adaptive management efforts. Reporting types may vary depending upon the type of monitoring activity that occurs, although some level of reporting should occur for most monitoring types. Potential reporting types and frequencies that may be useful for the Island include:

- Annual summary report to the JIA Board to document ongoing work conducted by staff, partners, and volunteers
- Annual or more frequent data placed on websites for public and researcher review
- Publish papers or presentations at professional societies of ongoing work conducted on the Island
- Public education and stakeholder involvement through field programs, local and national presentations, and citizen science
- Periodic (monthly, quarterly, annually) reports of monitoring results in a community newspaper

Other reporting approaches may also be suitable for work conducted on the Island and the type and frequency of reporting will need to be considered based on staffing, volunteer levels, and other funding requirements.
FIGURE 6
RECREATION TRAILS

Legend
- Existing Paved Trail
- Existing Unpaved Trails/Field Roads
- Equestrian Trail (Beach Connector Segment)
- Plan Area
- Points of Interest
6.1 INTRODUCTION

One of the goals from the 2009 Conservation Strategy relates to environmental education for the general public. It has the following objectives and proposed actions:

1. **Objective A:** Provide well-planned public access to natural areas of interest in a manner that:
   - Protects specific natural resources and habitat integrity
   - Protects the Island’s sensitive areas and wildlife
   - Provides a quality natural history educational experience that integrates the Island’s natural communities
   - Increases visitor enjoyment
   - Brands Jekyll Island as a premier nature-based coastal recreational destination

2. **Objective B:** Develop educational programming and materials to promote stewardship of priority communities

6.2 ENVIRONMENTAL EDUCATION

On Jekyll Island, several distinct entities provide EE and environmental interpretation (EI) opportunities for the public – the Jekyll Island Authority, through its Georgia Sea Turtle Center; the University of Georgia, through its 4-H Program Centers; and private businesses operating nature-based tours. Each entity has its own separate Mission and Vision. With an eye for coordinating and integrating the overall nature-based experience for visitors to Jekyll Island, representatives from these entities met as the Jekyll Island Environmental Education Subcommittee, to craft a Mission Statement and Vision, Goals and Objectives for EE on the Island.

**MISSION**

To provide high quality, nature-based interpretive experiences and environmental education for a diverse general public.

**VISION FOR EE/EI**

Jekyll Island State Park will inspire its visitors to value the conservation of natural resources on barrier islands and beyond.

**GOAL FOR EE/EI**

The goal of the Education Committee is to ensure that the public is aware of, and provided with the opportunity to engage in coastal environmental learning opportunities and conservation efforts during their visit to Jekyll Island.
OBJECTIVES FOR EE/EI

- Expand Education Subcommittee membership to include regional expertise in EE and interpretive planning by soliciting additional members, including but not limited to participants from University and Park Service backgrounds.
- Implement collaborative marketing and communication strategies showcasing all Jekyll Island environmental organizations: Georgia Sea Turtle Center, 4-H Tidelands Nature Center, Jekyll 4-H Center, Dolphin Tours and Bird Rambles.
- Upgrade 4-H Tidelands Nature Center, the Georgia Sea Turtle Center and the Jekyll Island 4-H Center, and hire additional staff.
- Continue and expand presentations at local civic clubs and EE organizational meetings, visitors bureaus Rotary, Lion’s club, Convention and Visitors Bureau, Hotels Sales and Marketing, Golden Isles Chamber of Commerce. Develop PowerPoint slides that can be used in all JI-based education programs to promote all of the existing programs.
- Develop a formal volunteer program to assist in staffing various programs.
- Update and inform Jekyll Island employees who are in contact with the public (and others) on a regular basis regarding available environmental education programs on Jekyll Island.
- Develop a collaborative monthly lecture series on Jekyll Island to educate the public about a variety of topics related to coastal Georgia’s natural resources focusing on Jekyll Island.
- Collaborate with local research and conservation organizations and colleges such as College of Coastal Georgia, Savannah State College, Georgia Southern University, Skidaway Institute of Oceanography, University of Georgia Odum School of Ecology and Warnell School of Forestry and Natural Resources.
- Develop EE programs that depict ongoing research and conservation efforts in coastal Georgia. Develop student based projects and internships in EE.
- Continue and increase EE and EI staff participation in regional and national EE organizations and programs including Georgia Coastal Educator’s Group, Georgia Association of Marine Educators, Georgia Science Teachers Association, Environmental Education Alliance of Georgia, Georgia Adopt-A-Wetland, Project WET, and Project Wild.
- Continue to develop collaborative programs encompassing Jekyll Island’s EE opportunities and outreach: elderhostel, Boy and Girl Scouts, and teacher education.
- Continue to develop citizen’s science program and partnership possibilities for additional avenues to communicate EE and conservation on Jekyll Island.
- Provide staff with time to research and write effective grants to meet these objectives.
- Create a combined EE logo.
- Integrate conservation-based research and management into education programs at all facilities. Use captive animals to enhance the education process and to promote exploring the natural resources of Jekyll Island.

INVENTORY OF EXISTING EE AND EI OPPORTUNITIES

Jekyll Island has been a focal point for EE for years, and the entities identified above have an extensive history in providing facilities and programs for residents of Georgia and beyond. An inventory of the services provided by the entities involved with the initial EE subcommittee was compiled in order to begin to evaluate gaps in services, facilities and programs.

- Jekyll Island 4-H Center: comprehensive ecology classes for overnight school field trips.
- 4-H Tidelands Nature Center: day classes for schools, guided nature walks, guided kayak tours, and public summer ecology programs.
- Georgia Sea Turtle Center: public programs and turtle hospital interpretive talks, school field trips, outreach programs, guided turtle and nest walks, sea turtle camp, and scout programs.
- Boat Tours from the Historic Jekyll Wharf Marina: public and school programs.
- Birding and Nature Tours with Lydia Thompson: public bird rambles.
- Segway Tours: public maritime forest tours.
Jekyll Island 4-H Center
• Part of the University of Georgia College of Agriculture and Cooperative Extension.
• One of five centers in the state that offers the largest EE program in the country.
• Since 1983 the EE program has served over 225,500 participants.
• Serves public, private, and home schools; church groups; 4-H and scout groups with residential and day programs.
• Offers programs correlated to the Georgia Performance Standards.
• Offers classes in beach, maritime forest, marsh, invertebrates, birds, herpetology, orienteering, freshwater studies, and many other aspects of coastal ecology.
• Utilizes Dolphin and Eco tours, the Jekyll Historic District, and the Georgia Sea Turtle Center.
• Employs 12 full time staff and 13 seasonal staff during the school year, 9 during the summer.
• Provides internship opportunities.

Georgia Sea Turtle Center (GSTC)
• A Department of the Jekyll Island Authority.
• Primary mission is wildlife rehabilitation, research, and education.
• Rehabilitates all native turtle species.
• Provides emergency veterinary care for injured raptors and marine birds.
• Serves public, private, and home schools, church groups, college groups, 4-H and scout groups, elderhostel groups, motor coach groups, and convention groups.
• Offers programs correlated to the Georgia Performance Standards.
• Provides outreach to local community, schools, church groups, colleges, and veterinary schools.
• Exhibit Gallery features live coastal species including a sea turtle hatchling and epibiota tank, interactive and static displays.
• Daily Programs in the Exhibit Gallery and Rehabilitation Pavilion.
• School and group programs in sea turtle biology, threats and conservation.
• Public programs and opportunities include daily Turtle Walks and Nest Walks during the summer months.

4-H Tidelands Nature Center
• Part of the University of Georgia College of Agriculture and Cooperative Extension.
• Located on a saltwater pond on marsh side of the Island (a GADNR public fishing enhancement area) with a large dock and dockside teaching area; opened in summer 2000 to extend EE outreach beyond existing residential program provided by the Jekyll Island 4-H Center facility (located on South Beachview).
• Extends the 4-H program outreach to the general public for additional day use including island visitors, elderhostel groups, motor coach groups, and convention groups as well as college groups, local school groups, church groups, and scouts.
• Exhibit area (main and annex building) features live native coastal species and interactive and static interpretive displays focused on barrier island ecosystems.
• Features year round guided kayak tours through the salt marsh.
• School and group programs include full range of coastal ecology classes (similar to Jekyll Island 4-H Center).
• Public Nature Walks are provided at locations around the Island, including Clam Creek, St. Andrew’s, and South Dunes Picnic area.
• Offers public summer programs (Coastal Explorers, Seining, and Astronomy).
• Provides facilities for Jekyll 4-H summer campers and other EE groups.
• Offers programs correlated to the Georgia Performance Standards.
• Hosts an annual Art Inspired by Nature sale.
• Active in ongoing citizen-science programs (e.g., Adopt-a-Wetland, Oyster Reef Restoration).
• Provides internship opportunities.

Jekyll Island 4-H Center:
www.jekyll4h.org

4-H Tidelands Nature Center:
www.tidelands4h.org.

Georgia Sea Turtle Center:
www.georgiaseaturtlecenter.org
IDENTIFICATION OF GAPS AND OPPORTUNITIES

Gaps in Jekyll Island Education Programs suggested by the EE Subcommittee

1. **Need guidelines/criteria for eco based tourism:** Jekyll Island offers a great variety of natural resources for recreation and education. The goal is that all groups utilizing these assets will offer quality programming that adheres to all current regulations and policies. If there are new organizations or individuals that would like to develop nature based education programs on Jekyll Island, it is recommended that the Conservation Plan Education Subcommittee is presented with a detailed plan for the program for review and approval. Additionally, the Education Subcommittee will develop a required nature-based education orientation program. The committee will create a list of guidelines/criteria that all groups must adhere to when conducting educational programs on Jekyll Island. Topics will include but are not limited to how to approach wildlife/safe distance for viewing, training on flora/fauna, subject area is correct/review curriculum, credentials, protocols on what to do and what not to do. This information will be developed and available on a Jekyll Island Authority website focusing on nature based education programs.

2. **Improve Marketing/Communication:** As the draw to Jekyll Island includes the natural beauty of our coastal environment, marketing efforts should continue to showcase and highlight the natural Jekyll Island experience for visitors. As we move forward with revitalization and the Conservation Plan, marketing efforts should continue to enhance the visibility of individual organizations as well as collaborative efforts in providing coastal environmental learning opportunities for visitors. With that said, the following suggestions are noted with the idea that collaboration among organizations providing environmental learning opportunities will enhance our efforts to provide visitors with a memorable nature-based experience on Jekyll Island and perhaps one that inspires continued efforts toward conservation of Jekyll Island and its natural resources.

   • Design, develop and distribute joint marketing media showcasing Jekyll Island’s environmental activities such as rack cards, billboards, video segments, in events magazines and local newspapers, on websites and in Powerpoint presentations to local hotels, island amenities, schools, visitor centers, Chamber of Commerce, hotel guides, phone books, Events Magazine, Jekyll Golden Islander, Georgia Edition-Jacksonville Times Union, Faulkenberry Certain Publications, radio stations, and newspaper columns showcasing Jekyll Island.

**Eco Educational and Dolphin Boat Tours from the Historic Jekyll Wharf Marina**

- Provide educational and recreational boat tours for the public and private groups
- Provide information on the coastal and estuarine environment
- Correlated to Georgia Performance Standards for science studies

**Birding and Nature Tours with Lydia Thompson**

- Offers Bird Rambles (birding & nature tours) on Jekyll Island and surrounding area
- Offers Golf Cart Nature Tours from April to September
- Maintains weekly lists of birds seen on Jekyll Island and surrounding marshes
- Maintains a bird column for Jekyll Islander titled “Jekyll Birdchat”
- Maintains a bird column for Golden Isles Magazine titled “The Nature Connection”

**Segway Tours**

- Guided eco-friendly Tours
- Programs focus on maritime forest, plants, and wildlife

**Eco Educational and Dolphin Boat Tours:**

www.captainphillip.com

**Birding and Nature Tours with Lydia Thompson:**

www.coastalgeorgiabirding-lydia.blogspot.com

**Jekyll Island Segway Tours:**

The education subcommittee will work together on educational material for the Island

- Identify target markets to advertise and distribute information on Island attractions and programs. Collaborate with area businesses, Chamber of Commerce, Colonial Coast Tourism; develop surveys to assist in future marketing strategies

- Utilize innovative technology and marketing strategies (e.g., interactive websites, mobile marketing, audio-visual displays)

- Display nature based exhibits/kiosks at key locations (hotels, welcome center, and town center) to educate people about wildlife and proper etiquette while in nature; information about all the nature based educational and recreational opportunities will be including in these exhibits

- Utilize key marketing distribution locations (Convention Center groups, area businesses and hotels, civic groups, schools, chamber of commerce, island amenities, newspapers, welcome centers, state visitor’s centers, area attractions and Beachscape)

- Contact local businesses and area attractions to provide text information and links to the individual and joint opportunities to engage in the coastal environmental experience on the Island

- Provide information on the Island’s nature-based education programs to area travel groups, elderhostel and motor coach tours for Brunswick Golden Isles Chamber of Commerce, Convention and Visitors Bureau, Coastal Tours Motor Coach Company, Visitor Center Director, and Georgia State Welcome Centers to showcase all EE-ecotourism opportunities on Jekyll Island

- Participate in collaborative special events and outreach programs to schools, YMCAs, scouts, presentations to area youth organizations, and exhibit booths at area celebrations

- Link with Georgia youth travel website

- Highlight and promote all Jekyll Island EE organizations at the GSTC, Tidelands, and 4H and others

  - Prepare joint promotional programs for visitors, such as eco-tour packages

3. Increase Passive Nature Marketing/Interpretation (e.g., signage, ebird lists, brochures, and guides):

  Existing Passive Marketing items
  - Signs for Wildlife Watching Area in place in 2004
  - Signs for Island natural habitats in place in 2009
  - Seasonal Wilson’s plover nesting sign from April to August; as placed by the Coastal Georgia Audubon Society
  - Jekyll Island Bird and Butterfly lists
  - Door hangers and posters for businesses and hotels on beach lighting
  - CD: Dr. Dallmeyer’s “Jekyll Island: An Audio of Barrier Island,” a self-guided nature tour of Jekyll Island (2004) for sale
  - Taylor Schoettle’s books, “A Guide to a Georgia Barrier Island” and “A Field Guide to Jekyll Island”
  - Interpretive maritime forest trail map
  - Birding Hot Spots Pamphlet - Provides directions to birding locations on the Island
  - Wildlife websites available with registration like http://ebird.org/content/ebird and http://www.enature.com/fieldguides

  Proposed Passive Marketing
  - Develop a rack card that has basic information and contact information of all educational programming available on Jekyll Island
  - Develop a beach etiquette rack card
  - Develop an informational kiosk/exhibit in the new retail area, visitors center, and new convention center highlighting all of Jekyll’s environmental education opportunities
  - Develop a marketing strategy with geocaching program
  - TV channel about Jekyll Island environmental education opportunities
  - Increase environmental education signage
  - QR codes (a matrix barcode or two-dimensional code), which can be read & saved by cell phones with cameras, smart phone and touch pads; these new technologies can be placed on signs, kiosks and printed material
  - Increased web presence and visibility of attractions, individually and collectively through gateway sites such as www.jekyllisland.com
All projects proposed after the approval of this Conservation Plan that have the potential to affect natural systems on Jekyll Island must undergo a review to assess the potential environmental impacts. Each proposed project must demonstrate that it does not compromise the ability to preserve, maintain, manage, and restore Jekyll Island’s natural communities and species diversity.

The EAP will function in coordination with the Jekyll Island Master Plan and the Jekyll Island Design Guidelines. The EAP will consider any project that has the potential to affect natural systems, while the Design Guidelines review process is intended to address only development projects that involve the construction or renovation of vertical structures and associated site elements. The EAP will be conducted first, and the final EAP report will be transmitted, along with project plans, to the Design Guideline Technical Review Team. The structure of the EAP and the Design Guidelines review processes is outlined below.

ENVIRONMENTAL ASSESSMENT PROCEDURE

1. Guiding Document: Jekyll Island Conservation Plan
2. Review Team:
   • the Jekyll Island Director of Conservation
   • the Jekyll Island Director of Landscape and Planning
   • the Director of the Georgia Sea Turtle Center
   • the Georgia Sea Turtle Center Research Coordinator
   • a representative of the Georgia Coastal Regional Commission, and
   • two outside individuals appointed by the JIA Executive Director
3. Review Team Lead: the Jekyll Island Director of Conservation
4. Reporting: The EAP Review Team will report its findings to the Jekyll Island Authority Executive Director and Design Review Committee. If needed, the report will make recommendations for alterations to the proposed project in order to achieve the goals of the Conservation Plan.
5. Objective: Assure that development projects do not compromise the ability to preserve, maintain, manage and restore Jekyll Island’s natural communities and species diversity

DESIGN GUIDELINES

2. Review Team (the Technical Review Team):
   • JIA staff assigned by JIA Executive Director
   • Specialty consultants as determined by project type
3. Review Team Lead: the JIA Project Manager
4. Reporting: The Design Review Committee
5. Objective: Establish standards to promote environmentally-sound development and assure quality and consistency of design

The EAP is intended to determine whether there are any expected environmental impacts to landscape-level variables that would result in the recommendation for a modification or rejection of the proposed project due to inconsistencies with objectives for conservation on the Island. For projects that have none of these “fatal flaws,” a local/site scale evaluation will identify and recommend specific design elements required for approval of the proposed project.
7.1 LANDSCAPE-SCALE IMPACTS

The landscape-scale evaluation is intended to assess potential impacts from projects that could have relatively large-scale, or far-reaching effects on natural resources of the Island. This Plan creates a strategy for conservation that assumes protection of large blocks of the remaining natural areas. Proposed projects that would impact substantial areas of undisturbed natural lands, further fragment management units, or create a new impact in the middle of a relatively undisturbed community would be considered landscape-scale impacts. Other potential projects could have less dramatic impacts at the outset, but over time they could cause an impact to a broad array of natural resources, and therefore be inconsistent with conservation objectives on the Island. For this analysis, “landscape-scale” means those activities that could have environmental effects over large areas of the Island.

At the landscape-scale, proposed activities on Jekyll Island must have no impacts to:

- **Historical fire patterns** – A proposed development project that would preclude the use of fire as a management tool across the pine-dominated communities in the north end of the Island would be considered an incompatible, landscape-level impact. Similarly, much of the Island is vulnerable to stand-altering fires, and the management plan provides an approach to limit exposure to this threat. Any proposed project that would interfere with Island-wide objectives for managing fire would be considered an inappropriate landscape-scale impact.

- **Genetic flow of native species across the Island** – Proposed development projects that would further separate the Island into genetically-isolated fragments would be considered an incompatible landscape-scale impact.

- **Wildlife movement patterns** – Fragmentation impacts could cause changes in wildlife movement that could be deemed inappropriate. Many of the priority species of wildlife listed in Table 1 depend on the Beach, Dune and Sea Oats communities. Disturbances from proposed projects that could drastically change the movement patterns of nesting or wintering shorebirds, or sea turtles could be deemed a landscape-scale impact that would result in a rejection of the proposed project as incompatible with the objectives of the Conservation Plan.

- **Beach dynamics** – Proposed development projects must not jeopardize the plan for a natural dune system as the first order of beach protection from storm events and systematic erosion across the Island (including consideration of the anticipated effects of sea-level change).

- **River, marsh, or marine hydrology or flow patterns** – Landscape-scale impacts to hydrology would be those that would have far-reaching or systemic impacts to the function of wetland systems, either through direct or indirect impacts. These projects would not be acceptable or compatible with the objectives of the Conservation Plan.

- **Freshwater (surface and groundwater) hydrology** – Landscape-scale impacts to hydrology would be those that would have far-reaching or systemic impacts to the function of wetland systems, either through direct or indirect impacts. These projects would not be acceptable or compatible with the objectives of the Conservation Plan.

- **Population viability of native plants and animals** – Viable populations of plants and animals remain so through the ability to withstand short-term and long-term perturbations such as climatic extremes, disease, or unusually high predation. Projects which would be expected to jeopardize the ability of otherwise stable populations of plants and animals to withstand occasional extremes in weather, disease, predation, etc. would be considered an incompatible, landscape-level impact.

7.2 LOCAL/SITE SCALE IMPACTS

The review of local/site scale parameters is intended to assess potential environmental impacts that may have influence on one or more ecological communities in the vicinity of the proposed project. Potential design changes or alternative locations for proposed projects that could cause significant local/site scale natural resource impacts must be considered. An EAP review will likely result in specific design recommendations that would be required for project approval. An example of a local scale impact would be one in which changes in wetland hydrology could, over time, impact wetland function in an adjacent marsh. Site scale impacts could result in loss of native vegetation, or the growth of exotic species that could reduce biological diversity near the proposed project. The potential for incremental impacts or secondary impacts that could ensue from proposed activities must be considered.

At the local/site scale, proposed activities on Jekyll Island must avoid, then minimize impacts to:

- **Natural resource management activities** – The Objectives outlined in Chapter 5 provide the basis for maintaining or restoring natural systems.
on the Island, and their success should not be compromised by future development proposals. The approach to management is built on a concept of managing relatively large tracts of natural lands. A proposal for a new development parcel that would segment or fragment natural communities would be considered incompatible with the Objective.

- **Natural hydrology and existing drainage basins** – Alterations to historical drainage patterns have intentionally been conducted on the Island in the past, and opportunities for restoration of these impacts are suggested in several chapters of this Plan. Additional impacts to surface or groundwater flows, or proposed projects that would preclude the implementation of restoration activities to improve the function of freshwater or saltwater wetlands should be considered unacceptable local impacts.

- **Water quality, with particular consideration of nutrients in receiving waters** – Proposed development projects must provide a landscape management plan that will not generate high nutrient discharge and a plan for treatment of other stormwater constituents that could degrade water quality. These constituents include heavy metals, sediments, oils and grease, and pesticides and herbicides.

- **Protected species habitat** – Specific habitats used by species listed as Threatened or Endangered by the state or federal government in Table 1 are, for the most part, encompassed by Special Protection Areas shown on Figure 7. These habitats, including both acreages and functions for plant and animal assemblages comprising the SPA, should not be impacted by proposed development projects in a way that would compromise their use by listed species.

- **Priority Species Habitat** – Similarly, habitat for most of the priority species referred to in Table 1 are included in SPAs. These habitats should not be impacted by proposed development projects in a way that would compromise their use by priority species.

- **The structure, composition and abundance of native plant and animal species** – Proposed development projects must minimize impacts to natural communities.

- These impacts could be direct, such as new development on a tract of existing natural lands. Or they could be indirect, such as when development on one parcel causes a shift in vegetation structure or composition on an adjacent parcel as a result of the spread of exotic plants, changes in exposure to sunlight, or alterations in wind, salt or fire patterns. Though it is assumed that new development will cause the loss of some natural vegetation, these losses should occur along the edges of tracts of natural communities (and management units), should not fragment existing systems, and should minimize the footprint of disturbance, both direct and indirect.

- **Wetland function and extent** – Coastal and freshwater wetlands are identified below as SPAs, and their impacts should be avoided.

- **Local movements of wildlife** – Proposed development projects that are likely to fragment otherwise intact natural systems would be expected to impact local movements of wildlife. They should be avoided or their affects minimized by specific design elements.

Approved activities in buffers must not affect the functions of the natural system. Resource-based recreation and environmental education are presumed to be appropriate within buffers, so long as design elements to minimize disturbance are implemented.

New development, construction, and renovation will be required to utilize “Green and Sustainable Technology” and, where appropriate, achieve certification through LEED, Green Globe or other environmental certification programs. Proposed development projects that do not include environmental certification must provide an explanation to the EAP Review Team as to why certification is not plausible. All current and new projects will meet the sea turtle safe lighting and other regulating ordinance requirements.

Buffers will be established for SPAs in order to protect natural communities from the secondary impacts associated with disturbance. Buffers required by existing state and federal regulations should be considered minimal – it is expected that SPAs will typically warrant buffers larger than these minimum requirements. Buffers will be defined on a case-by-case basis by the Director of Conservation. Until then, the review will be conducted by the remainder of the EAP Review Team as described above. Buffers will be defined based upon:

- The vulnerability of the particular SPA
- The potential for introduction of invasive exotic species
- The potential for hydrological impact
- The potential for introduction of sediments/pollution
- The potential for disturbance/impacts to wildlife

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**Special Protected Areas include:**

- Georgia DNR-designated Priority Communities (defined in Section 7.4 below)
- The remaining coastal and freshwater wetland systems
- The wetland/surface waterbody used by nesting and roosting wood storks and other wading birds
- Critical Habitat for wintering piping plovers
- The Beach community association
- Appropriate buffers to these communities
FIGURE 7
SPECIAL PROTECTION AREAS

Legend

- Plan Area - 5,847.2 acres
- Wood Stork Colony - 6 acres (0.1%)
- Critical Habitat for Wintering Piping Plover - 155 acres (2.7%)
- Georgia DNR - Designated Priority Communities - 275 acres (4.7%)
- Freshwater and Coastal Marshes - 1,780 acres (30.4%)
- The Beach Community - 234 acres (4%)
7.3 OTHER RELEVANT ORDINANCES AND ACTS

Several other Jekyll Island Ordinances are currently in place that should be considered in this EAP. Likewise, the State of Georgia’s Coastal Marshlands Protection Act and Shore Protection Act provide protection of tidal marshes and sand dunes, beaches, sandbars and shoals that are particularly important natural resources on the Island. Because of the presence of several federally-listed species of wildlife (e.g., loggerhead sea turtle, green sea turtle, piping plover, wood stork), the Endangered Species Act is also germane to this review, as is Section 404 of the Clean Water Act because of the extent of federally-jurisdictional wetlands. These Acts and Ordinances have their own specific requirements that must be adhered to, and they may also inform the EAP review. Each Act or Ordinance may provide specific measures to avoid and minimize environmental impacts.

The EAP Review Team will assure that necessary permits or approvals required under existing regulations and ordinances have been obtained, including the:

- Jekyll Island Ordinances including:
  - Beach Lighting Ordinance
  - Landscape Design Guidelines
  - Pet Ordinance
  - Tree Ordinance
- Endangered Species Act
- Coastal Marshlands Protection Act
- Shore Protection Act
- Section 404 of the Clean Water Act

Jekyll Island Ordinances - (http://jekyllislandauthority.org/Ordinances.aspx)
Coastal Marshlands Protection Act - (http://crd.dnr.state.ga.us/content/displaycontent.asp?txtDocument=85)
Shore Protection Act - (http://crd.dnr.state.ga.us/content/displaycontent.asp?txtDocument=84)
7.4 PRIORITY COMMUNITIES

The priority communities were chosen for various reasons. Staff from Georgia DNR conducted detailed vegetative mapping on the Georgia coast and on Jekyll Island in particular. These detailed field exercises provided an understanding of the particular rarity of certain natural communities on Georgia barrier islands. Several of these communities were chosen as priority because they are globally rare, others were chosen because they are uncommon or rare on Georgia barrier islands. These include:

- Southern Hairgrass - Saltmeadow Cordgrass - Dune Fingergrass Herbaceous Vegetation
- Southern Atlantic Coastal Plain Carolina Willow Dune Swale
- Southeastern Florida Maritime Hammock
- South Atlantic Coastal Shell Midden Woodland
- Outer Coastal Plain Sweetbay Swamp Forest
- Loblolly-bay Forest

Other natural communities were selected as priority because they are barrier island freshwater wetlands. These communities are somewhat more common on barrier islands but represent critical habitats to barrier island wildlife that need a freshwater source. These include:

- Red Maple - Tupelo Maritime Swamp Forest
- Sawgrass Head
- South Atlantic Coastal Pond

Finally, the following communities are part of the dune system on the Island and are critical grassland and “scrubby” habitat especially for bird species:

- Live Oak - Yaupon - (Wax-myrtle) Shrubland Alliance
- Atlantic Coast Interdune Swale
- Sea-oats Temperate Herbaceous Alliance

Some trails have caused localized impacts to the natural environment

Interdune swale is a priority vegetative community on the Island
8.1 STAFFING AND VOLUNTEERS

The objectives of the Conservation Plan are ambitious and will require a sustained effort with dedicated staff. Current staff of the JIA can continue to implement some of the management actions identified in this Plan; however the Plan calls for additional work and staffing beyond what is currently employed by JIA. Focusing the efforts of other natural resource agencies and the energies of a substantial volunteer corps will help meet the objectives, but some additional staff will be required. The most significant of these hires is the Director of Conservation – a direct report to the JIA Executive Director. Meeting many of the priorities and strategies outlined in this Plan simply cannot be effectively implemented without this position. The JIA Executive Director has committed to including a budget for this position for consideration by the JIA Board in the next fiscal year. The responsibilities of the Director of Conservation are expected to include:

- Preparation of a budget and a plan for the staff needed to implement the Conservation Plan
- Implementing management actions from the Conservation Plan
- Budgeting and pursuit of additional funds to implement the Plan
- Natural resource agency collaboration, and the development and coordination of a network of partners
- Leading the Environmental Assessment Procedure (EAP) review
- Supervising natural resource staff

Other JIA staff, graduate students, interns, and volunteers will have substantial roles in the implementation of the Conservation Plan.
• Budget development and management
• Participation on the Jekyll Island Conservation Team
• Collaboration with wildlife management agencies (GADNR), conservation organizations, and universities
• Establishing undergraduate, graduate, and intern participation in Conservation Plan objectives
• Assistance in public education programs related to the Conservation Plan
• Increasing awareness of and participation in Island conservation efforts among stakeholder groups
• Working with JIA staff to develop guidelines and partnerships that result in “best practice” approaches to environmental issues (e.g., LEED certification)
• Assisting the Georgia Sea Turtle Center in wildlife and beach management activities
• Expansion of environmental education and ecotourism programs on Jekyll Island
• Timely and accurate progress reports to the Executive Director
• Attendance at Management Team meetings to address organizational issues
• Contribution to successful approaches to operational issues related to other teams

Qualifications
• Masters degree in Natural Resource management-related field is required. Minimum of three (3) years experience in natural resource (land and wildlife) management is required

Volunteers can help assure access is restricted to improve success of beach-nesting birds

Director Georgia Sea Turtle Center (GSTC)
• Chair: Jekyll Island Conservation Planning Committee and the Environmental Education Subcommittee
• Expertise/Duties: Wildlife health management and research, wildlife rehabilitation
• Supervisor of GSTC staff
• Coordinates sea turtle and terrapin related conservation, research, management, education and rehabilitation programs
• Coordinates wildlife health-related management and research on Jekyll Island with partners
• Adjunct professor at UF, UGA, and NCSU Colleges of Veterinary Medicine, and Clemson University

Research Coordinator (GSTC)
• Conducts ecological and wildlife research and management
• Manages biological field research and wildlife assessment programs
• UGA Savannah River Ecology Laboratory and Odum School of Ecology
• Coordinates sea turtle and terrapin related conservation, research, management, education and rehabilitation programs

Rehabilitation Coordinator (GSTC)
• Coordinates diamondback terrapin causeway conservation program
• Coordinates GSTC rehabilitation program

Education Coordinator (GSTC)
• Coordinates GSTC education and outreach program
• Member of the education sub-committee
• Collaborates and interfaces with all Environmental Education programs on Jekyll Island

AmeriCorps and Volunteer Coordinator (GSTC)
• Coordinates GSTC AmeriCorps and Volunteer programs which significantly interfaces with the Conservation Plan

Director of Landscape and Planning
• Coordinates natural resource management and interface of development with natural resources
• Manager of landscape crews

Grant writing and budget management experience
• GIS and mapping software expertise
• Experience working on conservation activities, and specific exposure with coastal conservation issues and Georgia’s barrier islands in particular is desirable
• Well-developed inter-personal, conflict resolution and negotiating skills
• Team player with good communication skills
Conservation Plan Implementation - Current JIA Staff

- Director Georgia Sea Turtle Center (GSTC): Terry Norton, DVM, Diplomate ACZM
- Research Coordinator (GSTC): Kimberly Andrews, Ph.D.
- Rehabilitation Coordinator (GSTC): Michelle Kaylor
- Education Coordinator (GSTC): Alicia Marin, MEM
- AmeriCorps and Volunteer Coordinator (GSTC): Jeannie Miller
- Director of Landscape and Planning: Cliff Gawron, M.S.
- Ordinance Officer: Steve Bolin
- Roads and Grounds Supervisor: Cade Stepp

Ordinance Officer
- Monitors compliance of various ordinances that interface with the Conservation Plan (e.g. lighting ordinance, Pet ordinance, etc)

Roads and Grounds Supervisor
- Manages invasive exotic species and nuisance animals
- Executes landscape management plan

NON-JIA EMPLOYEES RESIDING ON JEKYLL ISLAND AND INTERFACING WITH THE CONSERVATION PLAN

Jekyll Island 4H Center Director
- Environmental education for children
- Member of the Education Subcommittee

4-H Tidelands Nature Center
- Environmental Education
- Members of the Education Subcommittee
- Plant identification and invasive plant removal
- Wildlife monitoring programs in collaboration with the GSTC’s Research Coordinator

Audubon Volunteer
- Bird identification and monitoring
- Environmental education

Conservation Plan Implementation – Current Non-JIA Staff
- University of Georgia Tidelands Nature Center: Bryan England, Dawn Zenker, M.S
- Jekyll Island 4H: Donna Stewart
- Naturalist and Artist: Lydia Thompson

TEMPORARY STAFF/VOLUNTEERS

Graduate Students/veterinary students
- Conduct research and assist with wildlife rehabilitation

Conservation Planning Committee
- Edit and refine the Conservation Plan
- Conduct periodic reviews of the Plan
- Provide expertise on an as-needed basis

Environmental Education Subcommittee
- Develop comprehensive approach to Environmental Education
- Coordinate marketing and the production of educational materials
- Share staff, workloads, assistance with events

Citizen Volunteers
- Beach Ranger program
- Citizen Science programs
- Environmental Education and Interpretation
- Volunteers for monitoring, data collection, and environmental education
- Graduate students
- Long-term representatives of the Conservation Planning Committee

Several wading birds, like this black-necked stilt, are considered priority species on Jekyll Island.
POTENTIAL STAFF TO HIRE (VOLUNTEER) TO IMPLEMENT THE PLAN

The Director of Conservation position has been determined to be the key initial position to fill to move forward the Plan objectives. As the success of the program is demonstrated, additional staff positions may be considered in the future.

8.2 FUNDING

The Conservation Plan needs an associated budget with additional funds from a dependable (permanently-funded) source. However, some of the initial actions in the Plan can be implemented by re-allocating existing staff or by focusing the efforts of existing partners. These include:

- Research on fire ecology, rare plants, wildlife, particularly birds, turtles and other reptiles, and marine mammals through the GSTC, 4-H Tidelands Nature Center, GADNR and a number of university and college partners
- Monitoring of birds, exotic plants, wildlife on golf courses, beach erosion and accretion through GSTC staff, 4-H Tidelands Nature Center, GADNR, various universities, numerous volunteers, and Coastal Georgia Audubon
- Prescribed fire and fire prevention with the GA Forestry Commission
- Environmental Education and Environmental Interpretation through the combined efforts of the GSTC, 4-H Tidelands Nature Center, the Jekyll Island 4-H Center, private vendors, and the Environmental Education Subcommittee
- Mapping, monitoring of vegetative communities through GADNR
- Ordinance enforcement conducted by the JIA
- The EAP review, conducted through the JIA, and volunteers
- Light Pollution surveys conducted by the GSTC

A budget request will be made for Director of Conservation. Thereafter, a budget for this department will be developed by the person hired for this position. Shared resources will be established for an office assistant, AmeriCorps members, and volunteers. This position will be integrated into other JIA departments that have been established, including the GSTC and Landscape and Planning department. As the Plan matures, anticipated budget/financial resources will continue to be changed to meet adaptive management and conservation needs.

One funding source for conservation on the Island will be the establishment of a Conservation Fund through the Jekyll Island Foundation to fund the implementation of the Plan. Funding for the Conservation Plan could include significant resources from the JIA annual budget (including the GSTC), Jekyll Island Foundation fundraising efforts, and a percentage of the parking fee among other funding options. Additional funding opportunities suggested by Conservation Planning Committee members, external reviewers, residents, and the interested public include:

- An option for groups that use the Convention Center to add a specific line item for a contribution that would be placed in the Conservation Fund aimed at protecting natural resources on the Island;
- Fees for certain activities on the Island could be generated through volunteer donations or by visitors agreeing to pay an additional fee when they enter the Island;
- Directing penalties and fines associated with JIA ordinances such as the lighting, leash, and signage ordinances to the Conservation Fund held by the Foundation;
- A logo for the Conservation Plan will be developed and products containing the logo can be sold at various venues to benefit the Conservation Fund; and/or
- Seeking matching funds and applying for external funding.

JIA staff will assess short- and long-term budget needs, and options for generating revenue to cover projected expenses associated with implementation of the Plan.
8.3 PARTNERSHIPS

An extensive array of existing relationships contributes to resource protection on the Island. Leveraging more of these relationships will add to the effectiveness of the Plan. Existing and future partners include:

1. The 4-H and Tidelands Nature Center – staff serve as partners in education and research
2. Association County Commissioners of Georgia - participated in the mapping of coastal communities
3. Atlanta Audubon - helped establish Jekyll Island as an Important Bird Area
4. Atlanta Botanical Garden – potential partner
5. Audubon International - assisted in the development of resource-efficient approaches to golf course management
6. Clemson University – has collaborated on marine bird health-related research
7. Coastal Georgia Audubon Society – provides bird surveys; assistance with annual bird festival
8. Coastal Wildscapes - native plant education; collaborates with native plant sales and native plant propagation
9. Garden Club of Georgia – potential partner
10. Georgia Chapter of The Nature Conservancy - provides fire ecology strategies, invasive plant research and conservation planning; supported Christie Lambert’s involvement as a Conservation Planning Committee member
11. College of Coastal Georgia – supports class field trips and supplies, students, and volunteers for Jekyll Island; conservation research and education initiatives
12. The Georgia Conservancy - supported Beth Blalock’s involvement as a Conservation Planning Committee member
13. The Georgia Department of Natural Resources, including the Parks Division, the Wildlife Resources Division, the Coastal Division and the Historical Division - collaborates on sea turtle research, nesting shorebird surveys and research, winter shorebird surveys, coastal vegetation mapping, rare plant inventories, bird banding stations, law enforcement, boating access, fish stocking, aeration of ponds, boat ramp mitigation, oyster reef enhancement, and finfish and crustacean resources; also permits wildlife research and rehabilitation and serves as collaborators in coastal efforts; supported the involvement of Gabe Gaddis and Brad Winn as Conservation Planning Committee members
14. The Georgia Exotic Plant Pest Council - sponsors workshops on the control and eradication of exotic plants
15. The Georgia Forestry Commission - provides assistance with prescribed fires and fuel reduction
16. Glynn County Mosquito Control – potential source for applying eco-friendly pest management alternatives
18. The Joseph Jones Ecological Research Center and the Ichauway Plantation - teaming partners with the Georgia Sea Turtle Center for wildlife research with emphases on reptiles and amphibians, land management, and vegetation assessments
19. Little St. Simons Island - provides collaborative research, fire management strategies, native plant propagation, educational awareness, and lessons learned in land management and planning; data for research species such as sea turtles and the American oystercatcher; supported the participation of Stacia Hendricks and Scott Coleman on the Conservation Planning Committee
20. The National Marine Fisheries Service - shares data on sea turtle stranding mortality
21. Palmetto Bluff Conservancy – collaborator on wildlife research and development planning, in addition to providing advice regarding land and wildlife management tactics in coastal landscapes
22. The Ross Veterinary School in the Caribbean – collaborates on sea turtle research, veterinary students frequently do externships at the GSTC
23. Southeastern Wildlife Disease Cooperative Unit - provides necropsy on marine birds from the Island, potential resource for deer health management
24. St. Catherines Island Foundation – collaborates on the Georgia portion of the Envirovet course that is coordinated by the GSTC; collaborates on shorebird research; provides a recipient site for rehabilitated gopher tortoises; continuation of long-term rehabilitation of birds of prey treated initially by the GSTC
25. Tufts University - participates in seabird research; provides veterinary student interns and collaborates on graduate student programs; Conservation Medicine Master’s Program will supply students for various purposes
26. The University of Florida College of Veterinary Medicine, College of Agricultural and Environmental Sciences, and the Odum School of Ecology - GSTC staff maintains active roles through adjunct professorships and joint affiliations; provides student interns in landscape architecture; in particular, the Savannah River Ecology Laboratory facilitates grants and student opportunities, is a joint employer for the Research Coordinator position at the GSTC and researchers collaborate on the diamondback terrapin research project, in addition to other coastal research endeavors; veterinary student externs and veterinary specialists assist with sea turtle medicine
27. The University of Georgia: various departments, including the School of Environmental Design, College of Veterinary Medicine, College of Agricultural and Environmental Sciences, and the Odum School of Ecology - GSTC staff maintains active roles through adjunct professorships and joint affiliations; provides student interns in landscape architecture; in particular, the Savannah River Ecology Laboratory facilitates grants and student opportunities, is a joint employer for the Research Coordinator position at the GSTC and researchers collaborate on the diamondback terrapin research project, in addition to other coastal research endeavors; veterinary student externs and veterinary specialists assist with sea turtle medicine
28. The US Fish and Wildlife Service - provides Endangered Species Act funding through Cooperative Grants with Georgia Department of Natural Resources and assistance with migratory bird research and surveys
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AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water, and government. AECOM was founded upon a commitment to socially and environmentally responsible design and planning. The Orlando office of AECOM includes a mix of ecologists, recreation and park planners, landscape architects, and engineers that routinely work to identify sustainable solutions for environmentally sensitive programs. Our ecologists include experts on wetlands, wildlife ecology, botany, and resource policy who frequently collaborate on the development of conservation and land management plans for a broad array of public and private landowners covering thousands of acres of conservation lands across the Southeast US.

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